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Radar and laser speed camera detectors warn drivers when they are approaching 'LIVE' in-use radar and laser based speed cameras, typically mobile speed camera locations. They achieve this by detecting the various bands and beams that are emitted when Police and road safety team operators are using their radar and laser guns. While mobile cameras can and do use radar or laser technology, the vast majority of mobile speed cameras these days are laser based. Laser is the preferred method as the operating range is far greater, typically up 1 mile away, rather than that of radar which operates over a distance - typically 200-300yards. Radar, however is used in all live in-use Gatso speed cameras, so it is possible when using a radar detector to tell you if a Gatso camera at the roadside is live or not. It is worth noting that when using a radar detector on UK roads, you may receive a lot of false alerts from various sources. These include automatic shop doorway sensors - found at supermarkets and petrol station forecourts, traffic lights and traffic signals and even from other vehicles using adaptive automotive cruise control. However, to limit these false alerts it is possible to turn off radar bands/frequencies on detectors that feature radar detection. What are the limitations of a radar and laser detector? Ten to fifteen years ago Gatso speed cameras were the number one speed enforcement camera in use in the UK and having a radar detector was therefore extremely useful. These days however, and with advances in technology, the latest speed enforcement devices are NOT using radar detection. For example SPECS and VECTOR 'Average Speed Check' cameras use digital time stamped photos at two different points on a section of road to compare your average speed between them. While a radar and laser detector will alert you to mobile speed camera locations, it will not warn you to every fixed speed camera in use in the UK. When buying a speed camera detector you need to consider whether you want to receive alerts to speed cameras that do not use radar and laser. Speed cameras that are undetectable via a radar/laser detector include Truvelo, SPECS, VECTOR, HADECS 3 and Truvelo D-Cam. If you want to detect all speed cameras (fixed and mobile) via a dedicated speed camera detector you will need to buy a device that incorporates a GPS database within the device; the best speed camera detector to offerfull-protection (GPS, radar and laser) is the Snooper 4ZERO Elite BT. Alternatively, if you already own and use a sat nav with a speed camera database subscription, then you could consider adding a radar and laser only detector to your sat nav. You would then have effectively the same warnings to speed cameras as a dedicated speed camera detector. What Radar and Laser detectors are there to buy? We sell a selection of radar and laser detectors including the Snooper 4ZERO Elite BT. The Snooper 4ZERO Elite BT (pictured left) is a great radar and laser detector. In addition you can optionally use the Snooper 4ZERO as a GPS detector by registering the product with the manufacturer and subscribing to their speed camera GPS database. The Snooper 4ZERO does not require subscription to work; it will detect radar and laser bands without paying any subscription fee. To view/buy the Snooper 4 ZERO Elite BT click here. How does a Laser Detector work? Laser speed camera detectors warn drivers when they are approaching Laser based speed cameras. Laser usage in the UK is generally limited to mobile handheld devices, that the Police use on the roadside or from bridges. In 2007 Arrive Alive speed cameras in north Wales caught 55,704 offenders. Another 5,610 were caught by officers with hand-held laser devices. A Laser speed camera emits a narrow, focused Laser beam consisting of a series of pulses which are reflected back from the target vehicle. The times for these pulses to return are measured and from these the speed of vehicle can be calculated. How does a Radar speed camera work? Gatso speed cameras and Radar guns operate by emitting a radio signal at a set frequency (e.g. K Band) which is then reflected by the target vehicle. The reflected signal frequency is shifted in direct proportion to the vehicles speed and this shift is used by the Radar equipment to calculate the vehicles exact speed. There are several radar bands that are used in the UK and Europe, these are: X Band K Band Ka Band Ku Band How does a Radar Detector work? A radar signal is conical in shape much like a torch beam. At 200yards, the normal operation range of a radar gun, the signal is a wide as a dual carriageway. Most of the signal therefore, goes past the target and on up the road - reflecting off trees and houses etc eventually becoming 'radar scatter'. Radar detectors are extremely sensitive radio receivers tuned to these frequencies and can detect very small particles of 'radar scatter' at up to two miles away. Radar and Laser Detector Questions and Answers Question: Is there any advantage to buying and using a radar and/or laser detector? As such devices (radar/laser based) can only be used in known accident blackspots and as such are recorded in the GPS database?Or, can police radar/laser devices be used in unknown locations? Answer: The advantage of radar detection: Alerts to mobile speed camera handheld radar guns, in addition alerts to live radar based fixed cameras e.g. Gatso speed cameras. The disadvantage of radar detection: False alerts via automatic shop door sensors e.g. petrol stations doorways or other radar based roadside devices. The advantage of laser detection: Alerts to mobile speed camera handheld laser guns. The disadvantage of laser detection: None, you shouldn't get any false alerts when using a laser detector. The police and the safety camera partnerships across the UK, should be using known or dedicated accident blackspots which are recorded in the GPS database. However, this is not always the case. With detectors such as Snooper 4ZERO Elite BT (featuring radar and laser detector) if the alerts become too frequent and annoying you can simply turn off the radar band. If you buy a speed camera detector without a radar/laser detector you can't turn it on! Question: I am thinking about purchasing a Radar/Laser detector but was wondering in the UK what mobile cameras are used the most at the side of the road or from vans on bridges etc?Radar or Laser?If its laser then I hear that detectors are a waste of time because you are target =ed and by the time it detects you have already been caught. Is that correct? Answer: Radar and Laser are both used in the UK, however Laser is far more frequently used than Radar. You are correct to stay that a Laser detector can be too late in warning. My recommendation is to buy a speed camera detector with a GPS database and then subscribe to the database. Some GPS based speed camera detectors such as the Snooper 4ZERO Elite BT also include Radar and/or Laser detection. Are Radar and Laser Detectors Legal? It is 100% legal (October 2020) to use a Radar and/or Laser speed camera detector in the United Kingdom to warn of all speed camera locations - fixed and mobile. However the legality differs from country to country in Europe. For example it is understood to be illegal in France, where the Gendarmerie (French Police) have been known to make motorists drive over their Radar and Laser detectors! For further information please visit our Speed Camera Detector legal page. Last updated: 1st August 2024 Police laser guns are a common tool that police officers use to issue speeding tickets all across the United States and Canada. They offer many advantages to a police officer over a radar gun and radar detectors dont actually help against a police laser gun. Laser jammers are required to combat laser guns. How does police laser work and what do you need to know about it to avoid speeding tickets?Police officer shooting laserPolice Laser Gun OverviewUnlike police radar guns which send a big blast of radar waves down the road that anyone running a radar detector can easily pick up on ahead of time, police laser (or lidar) guns send a pinpoint beam of light thats specifically aimed at just one vehicle at a time. This has the advantage of making it easier for the officer to tell which vehicle he is getting a speed reading from as well as not providing advanced warning to oncoming drivers running countermeasures like radar detectors.Police laser gun pinpointing a specific vehicleThe laser beam is very narrow (typically a mere 18 wide at 500 ft away) which makes it easy for police officers to target a specific vehicle and quickly identify which vehicle is producing the number on screen. This is especially useful in heavy traffic when lots of cars are around.Because the laser beam is so narrow and thin, radar detector users typically wont get any advanced warning before theyre targeted. An officer could be targeting the car next to you, ahead of you, or behind you, and your radar detectors laser detector wont be able to pick it up. Heck, its even possible for you to get targeted and your radar detectors laser sensor may not see it at all. Even if it does, by the time your radar detector goes off, its little more than a ticket notifier.Lets take a little closer look at how these police laser guns work.Note: Laser and lidar are used interchangeably. Lidar stands forLight Detection And Ranging.Tour of a police laser gunWould you like to see a police laser gun in action and see what the police officer sees?Heres a quick look at one popular laser gun, the LTI TruSpeed S.Next heres the TSS being used to issue tickets. First up is a vehicle behind me that gets nailed for speeding. Youll notice that my radar detector (Valentine 1) and laser jammer (Blinder HP-905) never goes off, even with the LEO shooting right over my shoulder.and heres a second encounter with me getting shot with laser from behind. I found an officer marked on Waze and wanted to watch him in action to see how he worked. When he finished writing one ticket and got set up to continue clocking vehicles, I drove past him. While driving, I accidentally missed a shift and instead of going from 2nd to 3rd gear, I went from 2nd down to 1st and inadvertently revved my engine as I passed. Whoops! He definitely noticed this, turned towards me, and shot me from behind to see if I was going to speed away. My laser jammers (AntiLaser Priority) went off instantly and I quickly killed my jammers to let him get a speed reading on my car. My radar detector (LRD950) never went off.Usually police officers will shoot laser from a handheld laser gun like this and chase you down themselves to give you a ticket.Other times theyll be set up somewhere shooting and someone else will be issuing the ticket. There may be some chase cars up the road ahead and the officer will radio in to vehicles up the road and theyll make the stop instead. Another option is that there could be a camera hooked up to the lidar gun and instead of making a stop in the first place, the police department will simply send a ticket in the mail.Handheld laser gun with a camera attached to the sideHeres a quick look at how this looks from the drivers point of view. This was up in Edmonton, Alberta. My radar detector (Stinger VIP) alerted me to a known speed trap where police commonly hang out and when I got shot from behind, my laser jammers (AntiLaser Priority) went off from behind and again I immediately killed my jammers to let him get a speed reading. (If youre wondering why Im killing my jammers, something thats very important to do,read this.)As you can see, laser is commonly used to target both the front and rear of vehicles (front is typically far more common) and police officers love using it in areas with higher levels of trafficHow do police laser guns calculate your speed?So how do these lidar guns work?Well if you look at the business end of a lidar gun, youll see two lenses. Behind one lens is an infrared (not visible light) laser transmitter and behind the other lens is a laser receiver that detects the laser beams reflections coming back.Lasers use light and we know the speed of light (roughly 186,000 miles per second). When we send a quick pulse of light out, it will travel from the lidar gun, to the target vehicle, and back. If we measure how much time it takes to get a reflection (time of flight), we can calculate how far the light had to travel. Because the laser beam had to make a round trip to the car and back, if we divide that number by two, well get the distance between the lidar gun and the target vehicle. Thats step one.Now one pulse will give us distance (not speed), but if we shoot a whole series of pulses, we can determine the change in distance over time which will tell us the vehicles speed. (Speed is simply a measure of distance divided by time, ie. feet/second or miles/hour).If its a little confusing to understand by reading, heres a video where I explain this visually and go into more detail.In short, the lidar gun is sending out a constant series of pulses, waiting for the reflections, and with a little math it can determine a vehicles speed, distance, and direction of travel.What areas of a vehicle do police officers target?Laser guns require a reflective target to get a reading off of so police have several primary targets that they aim for when clocking moving vehicles. These include:Headlights / tail lightsGrillLicense plateThose are shiny and reflective targets that make it easy for a laser gun to get a speed reading.Modern laser guns can get a reading off of most anywhere on the car including your bumper, body panels, and so on, but police will generally target the most reflective targets.What are the differences between radar and laser?Police laser is different than police radar. Heres some of the main ways that laser is different than radar:Police officer must be stationary when using laser. With radar they can be stationary or moving.Laser makes it easy to pinpoint a specific vehicle in traffic.Laser guns must be held up to the eye so the officer can aim.Laser doesnt provide radar detector users with advanced warning.Laser is effective against radar detectors.Laser can be jammed by laser jammers.What do handheld laser guns look like?Laser guns come in several different form factors. Here in the US youll almost always encounter handheld guns, typically shaped sort of like a pistol.Here is the Kustom ProLaser III, the most common police laser gun in use in the US.Youll notice that with the PL3, the lenses are set up in a side-by-side configuration. Other laser guns are designed with the lenses stacked on top of one another such as the LTI TruSpeed.Some older guns like the Kustom ProLaser II had one lens actually inside of the other, but this is an older design thats not really used anymore.Some laser guns are shaped less like a gun and more like a set of binoculars. The LTI TruSpeed S is a good example.As with all handheld police laser units, they need to be held up to the eye to be used, allowing the officer to look through the viewfinder and place the crosshair directly onto the desired target.What do photo laser guns look like?Photo laser is a little different. Its basically a police laser gun integrated with a camera and instead of chasing down a speeder, an officer will take a photo and mail the vehicle owner a ticket. Lets take a look at what photo laser guns look like.The easiest way of doing photo laser is to simply combine an existing laser gun and camera and put them together such as with the Kustom LaserWitness Lite.This can be a bit bulky so laser gun manufacturers also offer cameras built directly into the laser guns for a more compact setup such as in the LTI TruCam.There are also some unmanned photo laser setups available too. Since you dont have a person actually aiming the laser guns at specific vehicles, they are set up in a way where they can scan multiple lanes of traffic automatically. Heres an example with the Policscan.Youll notice in that photo, the laser gun is installed in a pole along the side of the road. This is a fixed photo lidar setup.They also have mobile photo lidar setups that can either be set up on the side of the road or installed inside a vehicle parked next to the road.Photo laser is much more common abroad. Here in the US its mostly handheld laser that youll see in practice. There is some manned photo laser and even less unmanned photo laser here, but the vast majority is normal handheld laser.How accurate is laser?Because laser guns are being used to issue speeding tickets and their readings have to hold up in the court of law, they have to be accurate. Police laser guns are generally accurate down to +/- 1 mph or +/- 2 km/h.In order to ensure that the gun has a good lock, it has to get a bunch of return pulses that all make sense. Getting just 2 or 3 pulses isnt enough. Laser guns typically take about 0.3 sec to get a lock on a vehicle and for an example laser gun that fires 200 pulses per second, this means it needs 60 return pulses to get a reading.As a vehicle moves towards or away from the gun, the distances should all make sense something like 1000 feet, 999, 998, 997, 996, and so on. Its only with a smooth set of distances like this that the gun can ensure that its locked onto a single target, it has a clean lock, and so on.How do laser jammers work?Modern laser jammers actually exploit this requirement. What they do is when they detect that a police laser gun is firing at them, they send back their own laser pulses that make absolutely no sense to the gun. What the laser gun will see is distances that look like 1000 feet, 350.2, 26.4, 125.7, 553.8, 300.1, etc. A laser gun looks like that and has no idea what to make of it, so it displays no speed and continues to fire, waiting for a series of return pulses that make sense.For more information about laser jammers, watch my videos on how smart laser jammers work and how brute force laser jammers work.How far away does laser work?How far away can a laser gun acquire a speed? It depends on a variety of factors such as the design of the specific gun, how large the target vehicle is, and even how stable the police officer is (if theyve got more handshake or theyre shooting in the wind, it can be tougher to keep a solid lock on a small vehicle farther away).If you look through manufacturer spec sheets, youll typically see maximum distances listed on the order of 2,000 6,000 feet or so.However, in some areas, theres actually laws regarding how far away officers are legally allowed to shoot, independent of what the gun is capable of. Sometimes they have to shoot within 1,500 feet or less, for example. One reason for this has to do with beam divergence.You see, the laser beam actually starts to widen (diverge) as it travels through space. It doesnt stay a tiny, fixed dot forever.The exact amount that the beam diverges varies from gun to gun, but a beam divergence of around 3 milliradians is pretty common. This means that 500 feet away, the laser beam will be 18 wide (US license plates are 12 wide). 1,000 feet away, the beam is 36 wide. 2,000 feet away, the beam is 72 (6 feet) wide.If you start shooting too far, you increase the likelihood of thinking youre targeting one car but actually getting readings off of the car next to it. This is why some police departments limit the maximum range that officers are allowed to shoot. They want to ensure that when an officer says they got a reading on a particular car, theres no concern that they inadvertently got a reading off of a different car.Not only that, but as you go farther away, the target gets smaller, handshake gets magnified, and sometimes the crosshair itself will actually completely obscure the little speck of a vehicle at a distance. Magnified viewfinders and tripods / leaning against a vehicle can help, but theres still practical limits. While it is possible to get readings off of vehicles thousands of feet away, and bigger vehicles make this easier, laser is generally something youll see at closer distances.Does poor weather affect laser guns?How does rain or snow impact the laser guns ability to get a speed reading? With all the extra precipitation in the air blocking or even reflecting the laser beam, it can be more challenging for a laser gun to get a reading. Its for this reason that many laser guns actually have a poor weather mode.What that does is reduce the minimum range that the gun can get a reading from so that it ignores any very close readings (ie. a big fat rain drop a few feet away from the gun). For example, when set to poor weather mode, the laser gun may require the vehicle to be 200 feet away or more in order to be able to be measured. This ensures that the laser gun is only measuring targets beyond the range of where rain and snow can affect the lasers ability to capture a speed reading.Laser can also be operated within a vehicle and shot through a window or windshield so yes, even if its raining out, police can still user laser.Are some vehicles harder to clock with laser?People often ask if some vehicles are harder to get a reading off of than others. Are black cars harder to get a reading from because theyre less reflective, for example?Modern lidar guns are really good at getting a lock on a vehicle. Any vehicle. Even motorcycles. Older guns used to struggle with this more, but modern guns have no issue getting a lock on cars, particularly at close range which is how laser guns are designed to be used. That said, some vehicles are a little easier or harder than others.Vehicle typeSome of the toughest cars to get a reading on would be low profile sports cars. Big SUVs and vans are much easier to get a reading off of, especially at a distance when the target is smaller. You can probably guess why. When you have a big target, its easier for a lidar gun to get a reading. Sports cars usually have a smaller wedge-shape up front for improved aerodynamics and so the smaller target area can make it tougher to get a lock on the vehicle, especially at a distance, and so it may take a little bit longer to get a reading off of some vehicles than others, but the gun can definitely still do it.Front vs. RearIts normally easier to get a lock on the rear of a vehicle. The front is usually angled and more wedge-shaped to minimize wind resistance while the back is usually pretty flat and perpendicular. The large perpendicular rear of a vehicle is easier to get a speed reading from than the front. Plus everyone has (reflective) license plates in the rear while front plates are only required by some states.Vehicle colorPaint color doesnt make a big difference to laser guns, not anymore anyway. Whether the vehicle is black, white, or silver, a laser gun will be able to get a reading off of the car.How to Defeat Police Laser?As drivers, we may want to have defenses to protect us from laser guns. I recommend having multiple layers of protection to help swing the odds into your favor. What are the different options available, both effective and ineffective, and how well do they work?Radar detectorsRadar detectors have laser detectors built into them so they can alert you to laser up ahead, but in practice theyre nearly useless. Against police radar, sure youll get advanced warning and theyre great for that. Laser is a different animal and you generally wont get advanced warning against laser guns.With laser, your radar detector will typically only go off when the officer is targeting you and by then its too late. By the time it goes off, hes got your speed and your radar detector is little more than a ticket notifier. Great Heck, often times you can get shot and your radar detector wont even go off at all. Thats super common too. With laser being such a thin beam, since your radar detector is installed up on your windshield and hes aiming down at your grill somewhere, the radar detector is too far away to even see the beam.Some people may want to run their radar detector low on their windshield to help increase the odds of detecting laser, but this will diminish radar detection performance and again, even if your radar detector does go off, hes already got your speed anyway so that really wont help much.Now it is possible to sometimes get advanced warning against laser, especially with a very sensitive laser detector in your radar detector. The laser beam can bounce and reflect off of a vehicle thats getting shot ahead of you and you can get alerted before youre the one being clocked. This is known as scatter, but it is extremely rare and is in no way a reliable way to protect yourself from speeding tickets. Theres better solutions available than a radar laser detector.Laser jammersLaser jammers are the best tool you have to combat laser. They are specially designed devices installed in the grill area of your car that not only detect laser like a radar detector, but they also fire back and jam the laser gun, preventing it from getting a reading. When you get shot, the alarms start going off in your car, you slow down to the speed limit, kill your jammers, and let them get a reading off of your car, and you go on your merry way.There are a number of different laser jammers available. However, the best and most effective laser jammer on the market is the AntiLaser Priority. You can read my review of the ALP here.Laser jammers do need to be installed properly in order to be effective. Many people actually do it wrong and wind up installing them in a way where they cant provide adequate protection. Its for this reason that Ive put together a comprehensive laser jammer setup guide to help walk you through the process so that you can avoid all the common mistakes and have an effective laser jammer setup.People often ask about the legality of laser jammers as well. Laws vary from state to state, so check out my article on laser jammer laws if youre curious.Laser scramblersTheres a company called Rocky Mountain Radar which sells radar detectors with a unique feature they call scrambling which is essentially a passive jammer. It functions different than a traditional jammer, but it actually doesnt work at all. RMR is considered to be one of the biggest scammers in the industry and they prey upon innocent customers by advertising a bunch of nonsensical technobabble to try and confuse people, but in reality their products are snake oil.If youd like to see for yourself, Ive tested the RMR C495 against different police lidar guns, Ive tested theRMR Judge against police lidar guns, and Ive put the RMR on an oscilloscope alongside a laser gun and an actual jammer to show the difference between how they operate (the RMR doesnt actually emit anything).The scrambling functionality is nonsense and the company isnt being honest with you. Stay away.Veil laser absorbing paintSpeaking of passive laser protection, another option is Veil. Its a laser absorbing paint that you apply to the reflective areas of your vehicle including your headlights, fog lights, and license plate if applicable. The idea is it absorbs laser, preventing the laser gun from getting a reading for a few seconds, long enough for your radar detector alert (assuming it does) and you can slow down before he gets a reading. Good idea, but unfortunately it has a number of serious issues, even besides the fact that it isnt effective.The previous generation of Veil (G4) had issues with cracking peoples headlights. Veil changed their formula with G5, but it was so dark that youd have bigger issues than dealing with laser guns. If you look at the photo above, the problem is obvious.The formula has been changed yet again to make it lighter, but unfortunately that doesnt change the fact that Veil simply isnt effective at preventing laser guns from getting a reading. You can take a look through several different independent tests (Veil Test A, Veil Test B) and youll see for yourself. Ive run both the old version and the new version in the past before and, well, I definitely dont run it anymore.Against areas of your car where Veil is applied, laser guns can get a reading. Even it could block laser guns, against the parts of your car where Veil cant be applied, such as your bumper or body panels, laser guns can get a reading too so even if it did work, theres still some big problems with the product that formula changes wont resolve.Im all about having several different layers of protection to all complement one another. Veil is less than $100 so its not a lot of money, but unfortunately its nevertheless a poor investment. Not recommended.License plate coversAnother option to help keep you protected is to put a laser diffusing license plate cover over your vehicles license plate. The idea is that even if its not going to fully protect you from laser guns, every little bit helps, right?Ive had a chance to test these out twice before and found that laser guns are still able to get a reading off of a license plate covered with these covers.Not recommended.WazeThe last thing Im going to talk about is something I actually do recommend, running a cloud-based alert sharing app likeWaze. Waze is a free GPS navigation app like Google Maps, but the killer feature is that it allows you to report where police officers are as you drive. See an officer set up on the side of the road running laser? Mark him in Waze and alert everyone else running the app. Theyll do the same for you in return and so everyone wins.Since police officers have be stationary when running laser, unlike when theyre using radar, Waze is an excellent countermeasure for laser.Its certainly not a replacement for laser jammers. Rather, its a complement to it.If an officer just arrived and hasnt been marked in the app yet, if its dark at night and no one can see him, or for some reason hes not in the app yet, your laser jammers will provide you with the save.If hes marked on Waze but youre only running laser jammers up front and he shoots you from behind, your laser jammers wont help but Waze will save you.Theres also times with both of them will protect you, so its all about having multiple effective layers complementing one another to help you improve your odds.Escort LiveFinally, theres another app called Escort Live which is very similar to Waze, except that its designed to integrate with Escort radar detectors. The idea is that when an Escort radar detector gets a legitimate radar or laser alert, it will post that to the cloud automatically (unlike Waze where you have to report police spotted manually) and every driver in the area can benefit.Personally I find that Waze has the edge in alerting simply due to the fact that it has way more users reporting information, but both apps can help so you can run one or both apps backgrounded and hear the audio alerts through your phone when they are present.If you have an Escort Live compatible Escort radar detector like the iX, Max360, or Redline EX, those Live alerts can pop up on the face of your detector so you dont have to pay attention to your phone, a nice little advantage.Escort Redline EX alerting to Ka and Laser alerts ahead via Escort LiveConclusionPolice laser guns are an effective and deadly tool that police officers can use to issue speeding tickets. Learning a little bit about how they work will provide you with more understanding regarding what youre up against and how to defeat it.When properly equipped with the appropriate countermeasures including a good laser jammer and Waze, laser is really no big deal. Heck, grab a dashcam too and then youll be able to share videos all the fun laser encounters that you experience out on the road.Happy driving and drive safely out there! This website contains affiliate links and I sometimes make commissions on purchases. All opinions are my own. I dont do paid or sponsored reviews. Click here to read my affiliate disclosure. In the realm of law enforcement, precision is paramount, particularly when it comes to traffic policing. In the United Kingdom, one device stands out as a beacon of accuracy and reliability in measuring vehicle speeds: the LTI 20-20 UltraLyte laser speed detection device. Widely used by police forces across the UK, the UltraLyte is renowned for its advanced laser technology, allowing officers to precisely target vehicles and obtain speed readings quickly and efficiently.Advanced Laser TechnologyAt the heart of the LTI 20-20 UltraLyte lies its advanced laser technology. This device utilises state-of-the-art laser beams to measure the speed of vehicles with unparalleled accuracy. Unlike traditional radar-based speed detection systems, which emit radio waves, the UltraLyte emits laser pulses towards the target vehicle. These pulses bounce off the vehicle and return to the device, allowing it to calculate the vehicles speed based on the time it takes for the pulses to return.How do police laser guns work?Operating the LTI 20-20 UltraLyteOperating the LTI 20-20 UltraLyte police laser gun is a relatively straightforward process, albeit one that requires training and expertise. To begin, the officer aims the device at the target vehicle, typically using a sight or scope built into the device for precision targeting. Once the target is acquired, the officer activates the laser, emitting pulses towards the vehicle.The LTI 20-20 police laser gun then measures the time it takes for the pulses to return after bouncing off the vehicle. By analysing this data, the UltraLyte calculates the vehicles speed with remarkable accuracy, providing the officer with real-time speed readings.How does the LTI 20-20 police laser gun calculate your speed?The calculation of a vehicles speed by the LTI 20-20 UltraLyte is based on the principle of time-distance measurement. As the laser pulses travel towards the target vehicle, they cover a certain distance. Once they bounce off the vehicle and return to the device, the device measures the time it took for the pulses to complete this round trip.Using the formula Speed = Distance/Time, the UltraLyte calculates the vehicles speed by dividing the distance covered by the laser pulses by the time it took for them to return. This calculation is performed almost instantaneously, providing officers with accurate speed readings in a matter of seconds.LTI 20-20 Police Laser Gun Strengths and WeaknessesThe LTI 20-20 UltraLyte police laser gun boasts several strengths that have cemented its reputation as a go-to device for traffic policing. Its advanced laser technology allows for precise targeting and accurate speed measurements, even in challenging conditions such as heavy traffic or adverse weather.However, like any technology, the UltraLyte is not without its limitations. One notable weakness is its susceptibility to interference from external factors such as atmospheric conditions or reflective surfaces. Additionally, the device requires a clear line of sight to the target vehicle, meaning it may be less effective in situations where obstacles obstruct the officers view.Despite these limitations, the LTI 20-20 UltraLyte police laser gun remains a cornerstone of traffic enforcement in the UK and one of the biggest challenges a laser speed trap detector can face, valued for its unparalleled accuracy and reliability in measuring vehicle speeds. As technology continues to evolve, its likely that future iterations of the UltraLyte will address these weaknesses while further enhancing its strengths, ensuring that law enforcement officers have access to the most advanced tools for maintaining road safety.Is it possible to detect police laser guns?How does the Aguri LP5000 Laser Pro detect the LTI 20-20 UltraLyte Police Laser Gun?In the race to avoid speeding fines and uphold road safety, drivers often rely on cutting-edge technology. Among these tools is the Aguri LP5000 police laser gun detector, renowned for its prowess in spotting the LTI 20-20 UltraLyte police laser gun. But how does it achieve this? Lets explore.Police Laser Gun Detection BasicsPolice Laser speed guns emit focused beams to measure vehicle speeds. These beams bounce off vehicles and return to the gun, enabling speed calculation based on travel time. Police Laser Detectors like the LP5000 intercept these beams, providing early warning to drivers.Detection MechanismThe Aguri LP5000 Laser Pro boasts specialised laser sensors tuned to detect police laser beams. Upon detection, it triggers audible and visual alerts, giving drivers time to check their speed and ensure they are driving within the speed limit.CompatibilityThe Aguri LP5000 police laser gun detector is calibrated to detect a range of police laser guns, including the LTI 20-20 UltraLyte. Its advanced algorithms discern genuine signals from false alarms, ensuring accuracy in identifying speed enforcement activity.Enhanced Police Laser DetectionWith heightened sensitivity and extended range, the Aguri LP5000 detects police laser gun signals from afar, affording ample reaction time. Multiple sensors within the device ensure comprehensive coverage, minimising the risk of missed alerts.Empowering DriversIn the ongoing cat-and-mouse game between motorists and law enforcement, tools like the Aguri LP5000 Laser Pro police laser gun detector provide vital support. By leveraging sophisticated detection technology, it furnishes drivers with a crucial defense against the LTI 20-20 UltraLyte and other police laser speed guns, empowering them to navigate with confidence and peace of mind.More from Aguri Follow us on Facebook and Instagram for the latest news, special offers and new product launches! Police laser guns are a common tool that police officers use to issue speeding tickets all across the United States and Canada. They offer many advantages to a police officer over a radar gun and radar detectors dont actually help against a police laser gun. Laser jammers are required to combat laser guns. How does police laser work and what do you need to know about it to avoid speeding tickets?Police officer shooting laserPolice Laser Gun OverviewUnlike police radar guns which send a big blast of radar waves down the road that anyone running a radar detector can easily pick up on ahead of time, police laser (or lidar) guns send a pinpoint beam of light thats specifically aimed at just one vehicle at a time. This has the advantage of making it easier for the officer to tell which vehicle he is getting a speed reading from as well as not providing advanced warning to oncoming drivers running countermeasures like radar detectors.Police laser gun pinpointing a specific vehicleThe laser beam is very narrow (typically a mere 18 wide at 500 ft away) which makes it easy for police officers to target a specific vehicle and quickly identify which vehicle is producing the number on screen. This is especially useful in heavy traffic when lots of cars are around.Because the laser beam is so narrow and thin, radar detector users typically wont get any advanced warning before theyre targeted. An officer could be targeting the car next to you, ahead of you, or behind you, and your radar detectors laser detector wont be able to pick it up. Heck, its even possible for you to get targeted and your radar detectors laser sensor may not see it at all. Even if it does, by the time your radar detector goes off, its little more than a ticket notifier.Lets take a little closer look at how these police laser guns work.Note: Laser and lidar are used interchangeably. Lidar stands forLight Detection And Ranging.Tour of a police laser gunWould you like to see a police laser gun in action and see what the police officer sees?Heres a quick look at one popular laser gun, the LTI TruSpeed S.Next heres the TSS being used to issue tickets. 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These include:Headlights / tail lightsGrillLicense plateThose are shiny and reflective targets that make it easy for a laser gun to get a speed reading.Modern laser guns can get a reading off of most anywhere on the car including your bumper, body panels, and so on, but police will generally target the most reflective targets.What are the differences between radar and laser?Police laser is different than police radar. Heres some of the main ways that laser is different than radar:Police officer must be stationary when using laser. With radar they can be stationary or moving.Laser makes it easy to pinpoint a specific vehicle in traffic.Laser guns must be held up to the eye so the officer can aim.Laser doesnt provide radar detector users with advanced warning.Laser is effective against radar detectors.Laser can be jammed by laser jammers.What do handheld laser guns look like?Laser guns come in several different form factors. 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Its basically a police laser gun integrated with a camera and instead of chasing down a speeder, an officer will take a photo and mail the vehicle owner a ticket. Lets take a look at what photo laser guns look like.The easiest way of doing photo laser is to simply combine an existing laser gun and camera and put them together such as with the Kustom LaserWitness Lite.This can be a bit bulky so laser gun manufacturers also offer cameras built directly into the laser guns for a more compact setup such as in the LTI TruCam.There are also some unmanned photo laser setups available too. Since you dont have a person actually aiming the laser guns at specific vehicles, they are set up in a way where they can scan multiple lanes of traffic automatically. Heres an example with the Policscan.Youll notice in that photo, the laser gun is installed in a pole along the side of the road. This is a fixed photo lidar setup.They also have mobile photo lidar setups that can either be set up on the side of the road or installed inside a vehicle parked next to the road.Photo laser is much more common abroad. Here in the US its mostly handheld laser that youll see in practice. There is some manned photo laser and even less unmanned photo laser here, but the vast majority is normal handheld laser.How accurate is laser?Because laser guns are being used to issue speeding tickets and their readings have to hold up in the court of law, they have to be accurate. Police laser guns are generally accurate down to +/- 1 mph or +/- 2 km/h.In order to ensure that the gun has a good lock, it has to get a bunch of return pulses that all make sense. Getting just 2 or 3 pulses isnt enough. 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What the laser gun will see is distances that look like 1000 feet, 350.2, 26.4, 125.7, 553.8, 300.1, etc. A laser gun looks like that and has no idea what to make of it, so it displays no speed and continues to fire, waiting for a series of return pulses that make sense.For more information about laser jammers, watch my videos on how smart laser jammers work and how brute force laser jammers work.How far away does laser work?How far away can a laser gun acquire a speed? It depends on a variety of factors such as the design of the specific gun, how large the target vehicle is, and even how stable the police officer is (if theyve got more handshake or theyre shooting in the wind, it can be tougher to keep a solid lock on a small vehicle farther away).If you look through manufacturer spec sheets, youll typically see maximum distances listed on the order of 2,000 6,000 feet or so.However, in some areas, theres actually laws regarding how far away officers are legally allowed to shoot, independent of what the gun is capable of. Sometimes they have to shoot within 1,500 feet or less, for example. One reason for this has to do with beam divergence.You see, the laser beam actually starts to widen (diverge) as it travels through space. It doesnt stay a tiny, fixed dot forever.The exact amount that the beam diverges varies from gun to gun, but a beam divergence of around 3 milliradians is pretty common. 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really no big deal. Heck, grab a dashcam too and then youll be able to share videos all the fun laser encounters that you experience out on the road.Happy driving and drive safely out there! This website contains affiliate links and I sometimes make commissions on purchases. All opinions are my own. I dont do paid or sponsored reviews. Click here to read my affiliate disclosure. Updated: 7-12-2025 by Veil Guy What is police laser?Police laser or police lidar, as its often referred to, is lidar used for measuring speed and for the issuance of speeding citations.LIDAR is an acronym for LIght Detection And Ranging.Lidar is mainly used for accurately measuring distances.Before we discuss how you can protect yourself from police laser traffic enforcement, lets first describe what it is.A police lidargun emits a highly focused beam of invisible infrared light in the near infrared region of light that is centered at a wavelength of 904nm and is only about 22 inches (56cm) in diameter at 1000 feet (300m), much tighter than the spread of police radar.Are police laser speed guns accurate?The short answer is, yes, very.A police lidar gun is very accurate and can often determine you speed to the 10th of miles per hour. Unlike police radar which directly determines a vehicles speed by measuring its doppler (speed induced frequency) shift, a police lidar gun calculates speed by observing the changing amount of time is takes to see a series of reflected pulses of light over a discreet period of time.Police laser was first introduced as a traffic enforcement tool in the early 1990s as a better alternative to police radar and offers police departments inherent advantages, namely:Precise targeting of vehicles out of a busy roadwayDifficult detection by motoristsFarther usable operating range than police radarHigher conviction rates than police radarTodays fifth generation police laser guns provide superior construction quality with improved optics, circuitry, and speed detection algorithms that are far more advanced and are proving to be especially lethal to drivers on the roadways, including those who use expensive laser jammers.Can police a police lidar speed gun be used at night?Yes this form of traffic enforcement can be and is often used at night and speed measuring distances can increase significantly making it extremely hard to know that your speed is being clocked.Can police laser be used in the rain or fog?Inclement weather can certainly have a negative impact on an officer trying to obtain your speed. Typically range drops from thousands of feet to a mere hundred or so. Newer police lasers have an inclement weather mode which can help improve speed detection ranges, however, its been our experience that when the weather gets poor, laser isnt used much as a means of speed enforcement. Its worth noting that even police radar is adversely affected by bad weather and ranges also tend to drop.But in any event, just because the distance drops, doesnt mean that police laser enforcement isnt any less lethal. Its also harder for you radar detector to detect the infrared laser light in these circumstances.Whats the maximum targeting range of police laser?Laser can be operated from very far distances, much farther than police radar, making it extremely difficult for the driver to know that they are being targeted. Unlike police radar, police lidar can be operated at such great distances, police officers really dont even have to hide like police radar operators, because its extremely hard to spot them from those extreme targeting distances. Some laser guns can successfully measure your speed as far away as 4000 feet or more, though generally targeting distances are below 2800 feet.Why is police laser more lethal than radar?Lidar enforcement technology was created specifically to target a select vehicle from a pack of them at much greater distance and precision than radar. It is not uncommon to drive in certain states and find yourself being targeted at greater than 2000 feet. Its routinely done in Maryland and Virginia, for example (only New Jersey has restricted targeting to 1000 feet or fewer).So at these distances the likelihood is that you wont even see the officer at all and by the time you do, it will be far too late.Long-distance targeting without advanced warning is what makes laser difficult to beat without a countermeasure such as Veil or a jammer (where legal) or both in combination.Can police lidar guns take pictures for evidence against you?Unfortunately, some guns do have the ability to take photos showing your vehicle and your speed, making it even more difficult to fight the speeding ticket in court, with the video evidence. The good news these guns cost police departments upwards of $7000 apiece, roughly four to five times the cost of a conventional gun. They tend to also be quite bulky. The exception to this is the LTI SXB which is very small and has bluetooth connectivity to a smartphone which can do the recording. But in all my travels, I have yet to encounter such a unit.Do police lidar detectors work?A good laser detector can be very good at detecting laser, although without the protection that Veil provides, drivers typically have little time to react (see videos with and without Veil). Only the Valentines front and rear lidar detector has demonstrated that it can provide advanced warnings when other vehicles are being targeted ahead and around you.How can you avoid lidar traffic enforcement speeding tickets?So, now that we have defined the threat, lets explore a simple way to protect you from being successfully targeted.Veil is a patented stealth technology which works by absorbing police lasers infrared light pulses (much the same way sunglasses absorb the visible sunlight). This makes it much harder on the guns to see their own reflected light pulses. The most reflective parts of an automobile or motorcycle are its headlights and license plates.By treating them with the Veil, the remaining and less reflective parts that are not treated wont give the guns enough of a reflection that they require at a given distance to be able to obtain a speed reading. This buys the driver precious additional time to safely react and to slow down during an attempted speed measurement.Discover how Veil can help keep you ticket free.Other popular articles Back to Top Police laser guns are a common tool that police officers use to issue speeding tickets all across the United States and Canada. They offer many advantages to a police officer over a radar gun and radar detectors dont actually help against a police laser gun. Laser jammers are required to combat laser guns. 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While it is possible to get readings off of vehicles thousands of feet away, and bigger vehicles make this easier, laser is generally something youll see at closer distances.Does poor weather affect laser guns?How does rain or snow impact the laser guns ability to get a speed reading? With all the extra precipitation in the air blocking or even reflecting the laser beam, it can be more challenging for a laser gun to get a reading. Its for this reading that many laser guns actually have a poor weather mode.What that does is reduce the minimum range that the gun can get a reading from so that it ignores any very close readings (ie. a big fat rain drop a few feet away from the gun). For example, when set to poor weather mode, the laser gun may require the vehicle to be 200 feet away or more in order to be able to be measured. This ensures that the laser gun is only measuring targets beyond the range of where rain and snow can affect the lasers ability to capture a speed reading.Laser can also be operated within a vehicle and shot through a window or windshield so yes, even if its raining out, police can still user laser.Are some vehicles harder to clock with laser?People often ask if some vehicles are harder to get a reading off of than others. Are black cars harder to get a reading from because theyre less reflective, for example?Modern lidar guns are really good at getting a lock on a vehicle. Any vehicle. Even motorcycles. Older guns used to struggle with this more, but modern guns have no issue getting a lock on cars, particularly at close range which is how laser guns are designed to be used. That said, some vehicles are a little easier or harder than others.Vehicle typeSome of the toughest cars to get a reading on would be low profile sports cars. Big SUVs and vans are much easier to get a reading off of, especially at a distance when the target is smaller. You can probably guess why. When you have a big target, its easier for a lidar gun to get a reading. Sports cars usually have a smaller wedge-shape up front for improved aerodynamics and so the smaller target area can make it tougher to get a lock on the vehicle, especially at a distance, and so it may take a little bit longer to get a reading off of some vehicles than others, but the gun can definitely still do it.Front vs. RearIts normally easier to get a lock on the rear of a vehicle. The front is usually angled and more wedge-shaped to minimize wind resistance while the back is usually pretty flat and perpendicular. The large perpendicular rear of a vehicle is easier to get a speed reading from than the front. Plus everyone has (reflective) license plates in the rear while front plates are only required by some states.Vehicle colorPaint color doesnt make a big difference to laser guns, not anymore anyway. Whether the vehicle is black, white, or silver, a laser gun will be able to get a reading off of the car.How to Defeat Police Laser?As drivers, we may want to have defenses to protect us from laser guns. I recommend having multiple layers of protection to help swing the odds into your favor. What are the different options available, both effective and ineffective, and how well do they work?Radar detectorsRadar detectors have laser detectors built into them so they can alert you to laser up ahead, but in practice theyre nearly useless. Against police radar, sure youll get advanced warning and theyre great for that. Laser is a different animal and you generally wont get advanced warning against laser guns.With laser, your radar detector will typically only go off when the officer is targeting you and by then its too late. By the time it goes off, hes got your speed and your radar detector is little more than a ticket notifier. Great Heck, often times you can get shot and your radar detector wont even go off at all. Thats super common too. With laser being such a thin beam, since your radar detector is installed up on your windshield and hes aiming down at your grill somewhere, the radar detector is too far away to even see the beam.Some people may want to run their radar detector low on their windshield to help increase the odds of detecting laser, but this will diminish radar detection performance and again, even if your radar detector does go off, hes already got your speed anyway so that really wont help much.Now it is possible to sometimes get advanced warning against laser, especially with a very sensitive laser detector in your radar detector. The laser beam can bounce and reflect off of a vehicle thats getting shot ahead of you and you can get alerted before youre the one being clocked. This is known as scatter, but it is extremely rare and is in no way a reliable way to protect yourself from speeding tickets. Theres better solutions available than a radar laser detector.Laser jammersLaser jammers are the best tool you have to combat laser. They are specially designed devices installed in the grill area of your car that not only detect laser like a radar detector, but they also fire back and jam the laser gun, preventing it from getting a reading. When you get shot, the alarms start going off in your car, you slow down to the speed limit, kill your jammers, and let them get a reading off of your car, and you go on your merry way.There are a number of different laser jammers available. However, the best and most effective laser jammer on the market is the AntiLaser Priority. You can read my review of the ALP here.Laser jammers do need to be installed properly in order to be effective. Many people actually do it wrong and wind up installing them in a way where they cant provide adequate protection. Its for this reason that Ive put together a comprehensive laser jammer setup guide to help walk you through the process so that you can avoid all the common mistakes and have an effective laser jammer setup.People often ask about the legality of laser jammers as well. Laws vary from state to state, so check out my article on laser jammer laws if youre curious.Laser scramblersTheres a company called Rocky Mountain Radar which sells radar detectors with a unique feature they call scrambling which is essentially a passive jammer. It functions different than a traditional jammer, but it actually doesnt work at all. RMR is considered to be one of the biggest scammers in the industry and they prey upon innocent customers by advertising a bunch of nonsensical technobabble to try and confuse people, but in reality their products are snake oil.If youd like to see for yourself, Ive tested the RMR C495 against different police lidar guns, Ive tested theRMR Judge against police lidar guns, and Ive put the RMR on an oscilloscope alongside a laser gun and an actual jammer to show the difference between how they operate (the RMR doesnt actually emit anything).The scrambling functionality is nonsense and the company isnt being honest with you. Stay away.Veil laser absorbing paintSpeaking of passive laser protection, another option is Veil. Its a laser absorbing paint that you apply to the reflective areas of your vehicle including your headlights, fog lights, and license plate if applicable. The idea is it absorbs laser, preventing the laser gun from getting a reading for a few seconds, long enough for your radar detector alert (assuming it does) and you can slow down before he gets a reading. Good idea, but unfortunately it has a number of serious issues, even besides the fact that it isnt effective.The previous generation of Veil (G4) had issues with cracking peoples headlights. Veil changed their formula with G5, but it was so dark that youd have bigger issues than dealing with laser guns. If you look at the photo above, the problem is obvious.The formula has been changed yet again to make it lighter, but unfortunately that doesnt change the fact that Veil simply isnt effective at preventing laser guns from getting a reading. You can take a look through several different independent tests (Veil Test A, Veil Test B) and youll see for yourself. Ive run both the old version and the new version in the past before and, well, I definitely dont run it anymore.Against areas of your car where Veil is applied, laser guns can get a reading. Even it could block laser guns, against the parts of your car where Veil cant be applied, such as your bumper or body panels, laser guns can get a reading too so even if it did work, theres still some big problems with the product that formula changes wont resolve.Im all about having several different layers of protection to all complement one another. Veil is less than $100 so its not a lot of money, but unfortunately its nevertheless a poor investment. Not recommended.License plate coversAnother option to help keep you protected is to put a laser diffusing license plate cover over your vehicles license plate. The idea is that even if its not going to fully protect you from laser guns, every little bit helps, right?Ive had a chance to test these out twice before and found that laser guns are still able to get a reading off of a license plate covered with these covers.Not recommended.WazeThe last thing Im going to talk about is something I actually do recommend, running a cloud-based alert sharing app likeWaze. Waze is a free GPS navigation app like Google Maps, but the killer feature is that it allows you to report where police officers are as you drive. See an officer set up on the side of the road running laser? Mark him in Waze and alert everyone else running the app. Theyll do the same for you in return and so everyone wins.Since police officers have be stationary when running laser, unlike when theyre using radar, Waze is an excellent countermeasure for laser.Its certainly not a replacement for laser jammers. Rather, its a complement to it.If an officer just arrived and hasnt been marked in the app yet, if its dark at night and no one can see him, or for some reason hes not in the app yet, your laser jammers will provide you with the save.If hes marked on Waze but youre only running laser jammers up front and he shoots you from behind, your laser jammers wont help but Waze will save you.Theres also times with both of them will protect you, so its all about having multiple effective layers complementing one another to help you improve your odds.Escort LiveFinally, theres another app called Escort Live which is very similar to Waze, except that its designed to integrate with Escort radar detectors. The idea is that when an Escort radar detector gets a legitimate radar or laser alert, it will post that to the cloud automatically (unlike Waze where you have to report police spotted manually) and every driver in the area can benefit.Personally I find that Waze has the edge in alerting simply due to the fact that it has way more users reporting information, but both apps can help so you can run one or both apps backgrounded and hear the audio alerts through your phone when they are present.If you have an Escort Live compatible Escort radar detector like the iX, Max360, or Redline EX, those Live alerts can pop up on the face of your detector so you dont have to pay attention to your phone, a nice little advantage.Escort Redline EX alerting to Ka and Laser alerts ahead via Escort LiveConclusionPolice laser guns are an effective and deadly tool that police officers can use to issue speeding tickets. Learning a little bit about how they work will provide you with more understanding regarding what youre up against and how to defeat it.When properly equipped with the appropriate countermeasures including a good laser jammer and Waze, laser is really no big deal. Heck, grab a dashcam too and then youll be able to share videos all the fun laser encounters that you experience out on the road.Happy driving and drive safely out there! This website contains affiliate links and I sometimes make commissions on purchases. All opinions are my own. I dont do paid or sponsored reviews. Click here to read my affiliate disclosure. Police laser guns are a common tool that police officers use to issue speeding tickets all across the United States and Canada. They offer many advantages to a police officer over a radar gun and radar detectors dont actually help against a police laser gun. Laser jammers are required to combat laser guns. How does police laser work and what do you need to know about it to avoid speeding tickets?Police officer shooting laserPolice Laser Gun OverviewUnlike police radar guns which send a big blast of radar waves down the road that anyone running a radar detector can easily pick up on ahead of time, police laser (or lidar) guns send a pinpoint beam of light thats specifically aimed at just one vehicle at a time. This has the advantage of making it easier for the officer to tell which vehicle he is getting a speed reading from as well as not providing advanced warning to oncoming drivers running countermeasures like radar detectors.Police laser gun pinpointing a specific vehicleThe laser beam is very narrow (typically a mere 18 wide at 500 ft away) which makes it easy for police officers to target a specific vehicle and quickly identify which vehicle is producing the number on screen. This is especially useful in heavy traffic when lots of cars are around.Because the laser beam is so narrow and thin, radar detector users typically wont get any advanced warning before theyre targeted. An officer could be targeting the car next to you, ahead of you, or behind you, and your radar detectors laser detector wont be able to pick it up. Heck, its even possible for you to get targeted and your radar detectors laser sensor may not see it at all. Even if it does, by the time your radar detector goes off, its little more than a ticket notifier.Lets take a little closer look at how these police laser guns work.Note: Laser and lidar are used interchangeably. Lidar stands forLight Detection And Ranging.Tour of a police laser gunWould you like to see a police laser gun in action and see what the police officer sees?Heres a quick look at one popular laser gun, the LTI TruSpeed S.Next heres the TSS being used to issue tickets. First up is a vehicle behind me that gets nailed for speeding. Youll notice that my radar detector (Valentine 1) and laser jammer (Blinder HP-905) never goes off, even with the LEO shooting right over my shoulder.and heres a second encounter with me getting shot with laser from behind. I found an officer marked on Waze and wanted to watch him in action to see how he worked. When he finished writing one ticket and got set up to continue clocking vehicles, I drove past him. While driving, I accidentally missed a shift and instead of going from 2nd to 3rd gear, I went from 2nd down to 1st and inadvertently revved my engine as I passed. Whoops! He definitely noticed this, turned towards me, and shot me from behind to see if I was going to speed away. My laser jammers (AntiLaser Priority) went off instantly and I quickly killed my jammers to let him get a speed reading on my car. My radar detector (LRD950) never went off.Usually police officers will shoot laser from a handheld laser gun like this and chase you down themselves to give you a ticket.Other times theyll be set up somewhere shooting and someone else will be issuing the ticket. There may be some chase cars up the road ahead and the officer will radio in to vehicles up the road and theyll make the stop instead. Another option is that there could be a camera hooked up to the lidar gun and instead of making a stop in the first place, the police department will simply send a ticket in the mail.Handheld laser gun with a camera attached to the sideHeres a quick look at how this looks from the drivers point of view. This was up in Edmonton, Alberta. My radar detector (Stinger VIP) alerted me to a known speed trap where police commonly hang out and when I got shot from behind, my laser jammers (AntiLaser Priority) went off from behind and again I immediately killed my jammers to let him get a speed reading. (If youre wondering why Im killing my jammers, something thats very important to do,read this.)As you can see, laser is commonly used to target both the front and rear of vehicles (front is typically far more common) and police officers love using it in areas with higher levels of trafficHow do police laser guns calculate your speed?So how do these lidar guns work?Well if you look at the business end of a lidar gun, youll see two lenses. Behind one lens is an infrared (not visible light) laser transmitter and behind the other lens is a laser receiver that detects the laser beams reflections coming back.Lasers use light and we know the speed of light (roughly 186,000 miles per second). When we send a quick pulse of light out, it will travel from the lidar gun, to the target vehicle, and back. If we measure how much time it takes to get a reflection (time of flight), we can calculate how far the light had to travel. Because the laser beam had to make a round trip to the car and back, if we divide that number by two, well get the distance between the lidar gun and the target vehicle. Thats step one.Now one pulse will give us distance (not speed), but if we shoot a whole series of pulses, we can determine the change in distance over time which will tell us the vehicles speed. (Speed is simply a measure of distance divided by time, ie. feet/second or miles/hour).If its a little confusing to understand by reading, heres a video where I explain this visually and go into more detail.In short, the lidar gun is sending out a constant series of pulses, waiting for the reflections, and with a little math it can determine a vehicles speed, distance, and direction of travel.What areas of a vehicle do police officers target?Laser guns require a reflective target to get a reading off of so police have several primary targets that they aim for when clocking moving vehicles. These include:Headlights / tail lightsGrillLicense plateThose are shiny and reflective targets that make it easy for a laser gun to get a speed reading.Modern laser guns can get a reading off of most anywhere on the car including your bumper, body panels, and so on, but police will generally target the most reflective targets.What are the differences between radar and laser?Police laser is different than police radar. Heres some of the main ways that laser is different than radar:Police officer must be stationary when using laser. With radar they can be stationary or moving.Laser makes it easy to pinpoint a specific vehicle in traffic.Laser guns must be held up to the eye so the officer can aim.Laser doesnt provide radar detector users with advanced warning.Laser is effective against radar detectors.Laser can be jammed by laser jammers.What do handheld laser guns look like?Laser guns come in several different form factors. Here in the US youll almost always encounter handheld guns, typically shaped sort of like a pistol.Here is the Kustom ProLaser III, the most common police laser gun in use in the US.Youll notice that with the PL3, the lenses are set up in a side-by-side configuration. Other laser guns are designed with the lenses stacked on top of one another such as the LTI TruSpeed.Some older guns like the Kustom ProLaser II had one lens actually inside of the other, but this is an older design thats not really used anymore.Some laser guns are shaped less like a gun and more like a set of binoculars. The LTI TruSpeed S is a good example.As with all handheld police laser units, they need to be held up to the eye to be used, allowing the officer to look through the viewfinder and place the crosshair directly onto the desired target.What do photo laser guns look like?Photo laser is a little different. Its basically a police laser gun integrated with a camera and instead of chasing down a speeder, an officer will take a photo and mail the vehicle owner a ticket. Lets take a look at what photo laser guns look like.The easiest way of doing photo laser is to simply combine an existing laser gun and camera and put them together such as with the Kustom LaserWitness Lite.This can be a bit bulky so laser gun manufacturers also offer cameras built directly into the laser guns for a more compact setup such as in the LTI TruCam.There are also some unmanned photo laser setups available too. Since you dont have a person actually aiming the laser guns at specific vehicles, they are set up in a way where they can scan multiple lanes of traffic automatically. Heres an example with the Policscan.Youll notice in that photo, the laser gun is installed in a pole along the side of the road. This is a fixed photo lidar setup.They also have mobile photo lidar setups that can either be set up on the side of the road or installed inside a vehicle parked next to the road.Photo laser is much more common abroad. Here in the US its mostly handheld laser that youll see in practice. There is some manned photo laser and even less unmanned photo laser here, but the vast majority is normal handheld laser.How accurate is laser?Because laser guns are being used to issue speeding tickets and their readings have to hold up in the court of law, they have to be accurate. Police laser guns are generally accurate down to +/- 1 mph or +/- 2 km/h.In order to ensure that the gun has a good lock, it has to get a bunch of return pulses that all make sense. Getting just 2 or 3 pulses isnt enough. Laser guns typically take about 0.3 sec to get a lock on a vehicle and for an example laser gun that fires 200 pulses per second, this means it needs 60 return pulses to get a reading.As a vehicle moves towards or away from the gun, the distances should all make sense something like 1000 feet, 999, 998, 997, 996, and so on. Its only with a smooth set of distances like this that the gun can ensure that its locked onto a single target, it has a clean lock, and so on.How do laser jammers work?Modern laser jammers actually exploit this requirement. What they do is when they detect that a police laser gun is firing at them, they send back their own laser pulses that make absolutely no sense to the gun. What the laser gun will see is distances that look like 1000 feet, 350.2, 26.4, 125.7, 553.8, 300.1, etc. A laser gun looks like that and has no idea what to make of it, so it displays no speed and continues to fire, waiting for a series of return pulses that make sense.For more information about laser jammers, watch my videos on how smart laser jammers work and how brute force laser jammers work.How far away does laser work?How far away can a laser gun acquire a speed? It depends on a variety of factors such as the design of the specific gun, how large the target vehicle is, and even how stable the police officer is (if theyve got more handshake or theyre shooting in the wind, it can be tougher to keep a solid lock on a small vehicle farther away).If you look through manufacturer spec sheets, youll typically see maximum distances listed on the order of 2,000 6,000 feet or so.However, in some areas, theres actually laws regarding how far away officers are legally allowed to shoot, independent of what the gun is capable of. Sometimes they have to shoot within 1,500 feet or less, for example. One reason for this has to do with beam divergence.You see, the laser beam actually starts to widen (diverge) as it travels through space. It doesnt stay a tiny, fixed dot forever.The exact amount that the beam diverges varies from gun to gun, but a beam divergence of around 3 milliradians is pretty common. This means that 500 feet away, the laser beam will be 18 wide (US license plates are 12 wide). 1,000 feet away, the beam is 36 wide. 2,000 feet away, the beam is 72 (6 feet) wide.If you start shooting too far, you increase the likelihood of thinking youre targeting one car but actually getting readings off of the car next to it. This is why some police departments limit the maximum range that officers are allowed to shoot. They want to ensure that when an officer says they got a reading on a particular car, theres no concern that they inadvertently got a reading off of a different car.Not only that, but as you go farther away, the target gets smaller, handshake gets magnified, and sometimes the crosshair itself will actually completely obscure the little speck of a vehicle at a distance. Magnified viewfinders and tripods / leaning against a vehicle can help, but theres still practical limits. While it is possible to get readings off of vehicles thousands of feet away, and bigger vehicles make this easier, laser is generally something youll see at closer distances.Does poor weather affect laser guns?How does rain or snow impact the laser guns ability to get a speed reading? With all the extra precipitation in the air blocking or even reflecting the laser beam, it can be more challenging for a laser gun to get a reading. Its for this reading that many laser guns actually have a poor weather mode.What that does is reduce the minimum range that the gun can get a reading from so that it ignores any very close readings (ie. a big fat rain drop a few feet away from the gun). For example, when set to poor weather mode, the laser gun may require the vehicle to be 200 feet away or more in order to be able to be measured. This ensures that the laser gun is only measuring targets beyond the range of where rain and snow can affect the lasers ability to capture a speed reading.Laser can also be operated within a vehicle and shot through a window or windshield so yes, even if its raining out, police can still user laser.Are some vehicles harder to clock with laser?People often ask if some vehicles are harder to get a reading off of than others. Are black cars harder to get a reading from because theyre less reflective, for example?Modern lidar guns are really good at getting a lock on a vehicle. Any vehicle. Even motorcycles. Older guns used to struggle with this more, but modern guns have no issue getting a lock on cars, particularly at close range which is how laser guns are designed to be used. That said, some vehicles are a little easier or harder than others.Vehicle typeSome of the toughest cars to get a reading on would be low profile sports cars. Big SUVs and vans are much easier to get a reading off of, especially at a distance when the target is smaller. You can probably guess why. When you have a big target, its easier for a lidar gun to get a reading. Sports cars usually have a smaller wedge-shape up front for improved aerodynamics and so the smaller target area can make it tougher to get a lock on the vehicle, especially at a distance, and so it may take a little bit longer to get a reading off of some vehicles than others, but the gun can definitely still do it.Front vs. RearIts normally easier to get a lock on the rear of a vehicle. The front is usually angled and more wedge-shaped to minimize wind resistance while the back is usually pretty flat and perpendicular. The large perpendicular rear of a vehicle is easier to get a speed reading from than the front. Plus everyone has (reflective) license plates in the rear while front plates are only required by some states.Vehicle colorPaint color doesnt make a big difference to laser guns, not anymore anyway. Whether the vehicle is black, white, or silver, a laser gun will be able to get a reading off of the car.How to Defeat Police Laser?As drivers, we may want to have defenses to protect us from laser guns. I recommend having multiple layers of protection to help swing the odds into your favor. What are the different options available, both effective and ineffective, and how well do they work?Radar detectorsRadar detectors have laser detectors built into them so they can alert you to laser up ahead, but in practice theyre nearly useless. Against police radar, sure youll get advanced warning and theyre great for that. Laser is a different animal and you generally wont get advanced warning against laser guns.With laser, your radar detector will typically only go off when the officer is targeting you and by then its too late. By the time it goes off, hes got your speed and your radar detector is little more than a ticket notifier. Great Heck, often times you can get shot and your radar detector wont even go off at all. Thats super common too. 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different independent tests (Veil Test A, Veil Test B) and youll see for yourself. Ive run both the old version and the new version in the past before and, well, I definitely dont run it anymore.Against areas of your car where Veil is applied, laser guns can get a reading. Even it could block laser guns, against the parts of your car where Veil cant be applied, such as your bumper or body panels, laser guns can get a reading too so even if it did work, theres still some big problems with the product that formula changes wont resolve.Im all about having several different layers of protection to all complement one another. Veil is less than $100 so its not a lot of money, but unfortunately its nevertheless a poor investment. Not recommended.License plate coversAnother option to help keep you protected is to put a laser diffusing license plate cover over your vehicles license plate. 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Learning a little bit about how they work will provide you with more understanding regarding what youre up against and how to defeat it.When properly equipped with the appropriate countermeasures including a good laser jammer and Waze, laser is really no big deal. Heck, grab a dashcam too and then youll be able to share videos all the fun laser encounters that you experience out on the road.Happy driving and drive safely out there! This website contains affiliate links and I sometimes make commissions on purchases. All opinions are my own. I dont do paid or sponsored reviews. Click here to read my affiliate disclosure. One of the most interesting things about being a radar detector manufacturer is that we get to see what the most common support questions are that come across our help desk. Radar detection and ticket avoidance can be a confusing subject sometimes thats the whole reason we created Radar University. Interestingly, of all the questions that are submitted, perhaps none is more common than, Whats the difference between Radar and Laser?Most people are familiar with the concept of handheld radar guns being used for speed enforcement traditionally, this is how speed readings were always obtained. But over the last fifteen years, a new type of speed enforcement technology has become more and more popular LIDAR, which is more commonly known as laser to the average driving enthusiast.Whats wrong with radar?Over several decades of successful use, radar had established itself as the go-to speed measurement tool for law enforcement officers. And why not? It was relatively cheap, accurate, easy to use, and reliable. From a usability perspective, there are really two primary problems with radar it has difficulty with heavy traffic, and it can be detected by radar detectors from a very long range away.Both usability problems with radar are caused by fundamental principles of how they work. Radar guns emit broad waves and measure speed by timing the return reflection from these waves bouncing off of cars. Radar waves are by nature physically wide if someone is shooting a radar gun at a tree one mile away, the radar waves emitted by the gun will also strike every other tree within a few hundred feet of the one being aimed at.Since these waves are wide and can travel for great distance, even though a police officer might be aiming at one particular car, the radar waves will continue to travel and bounce off of terrain and other objects for several miles. This is what radar detectors are actually picking up most of the time when they alert the radar reflections from a police officer shooting someone else up ahead of you.This same broadness is also what causes radar guns problems in heavy traffic. On a deserted highway where there may only be one car at a time, the width of the radar waves is not a problem. But on crowded city roads, radar waves will be hitting many different cars simultaneously. Contrary to one popular myth, this does not mean that radar guns cannot detect speed at all they still can. However, they will sometimes not be able to pinpoint target a randomly selected car from traffic.Radar gun manufacturers deal with the traffic problem in different ways some radar guns simply show the speed of the car moving fastest, and others can show the speed of three or four cars simultaneously. But none of them can provide the instant, pinpoint accuracy of a LIDAR gun.Advantages of Laser over RadarAt the most basic level, laser guns operate in a similar way to radar guns. LIDAR guns send out pulses of light (instead of radar) and measure vehicle speed based on the returned reflection pulses that bounce off of cars. However, unlike radar waves, the pulses that laser guns send out are extremely narrow you can think of them literally like the beam from a laser pointer.This solved both usability problems that traditional radar guns face. With a tight beam pattern that varies from just a few inches wide to a few feet, police officers can use LIDAR guns to measure the speed of individual, specific vehicles in heavy traffic. They simply look through the site, target a car, and pull the trigger. It typically takes about half a second for the speed to be obtained.Can radar detectors pick up laser? Problematically for radar detectors, the narrow beam of laser guns also mean that they cannot be reliably detected at distance. It is not uncommon for even the best radar detectors to not pick up a LIDAR gun beam until you are within visual distance of the police officer and by then, its probably too late. This is why the laser detection feature on most radar detectors is often called the ticket notifier. If it goes off, the police officer probably already has your speed.Can good radar detectors technically detect laser? Yes.Will radar detectors save you from a laser ticket? Perhaps, but it is a rare occurrence. For true protection against laser you will need to purchase a laser jammer.Defeating LIDAR with Laser JammersFear not though, as avid driving enthusiasts we have developed a solution for excellent LIDAR protection as well the Radenso RC M AL Priority Laser Defense Kit. While detecting laser beams from a distance with radar detectors isnt very effective, it is possible to shift or jam laser guns so that they cannot obtain a reading on your vehicle.Laser jammers, or shifters, are usually comprised of several small sensors that are installed on the front of your vehicle. These sensors have the ability to detect when a laser beam is targeting your car, and then return fire with a laser beam of their own. This return beam will be slightly modified from what the police LIDAR gun is expecting, and these additional unexpected laser pulses will make it impossible for the gun to get a speed reading.When running laser jammers, it is important to practice proper jamming etiquette. There are two styles of operating a laser jammer: Jam to Kill and Jam to Gun. Jam to Kill, or JTK, is when the user receives notification of a laser hit, gently and safely slows down to the speed limit, and then disables the laser jammer via a button press. Operated in this fashion, the police officer will not even realize he has been jammed; he will obtain a reading of the vehicle traveling at the speed limit and no ticket will be issued.Jam to Gun, or JTG, is when the user fails to disable the laser jammer and continues jamming the laser beam until they drive past the police officer. This is considered poor form and antagonistic in the radar detector community. When selecting a laser jammer, it is critical that you choose one that has a timer to automatically disable the jammer after a user-defined period of time. For example, the Radenso AL Priority Laser Defense Kit lets the user choose anywhere from 1-9 seconds.We generally recommend that our users set their jammers to a five or six second timeout. This will give you plenty of time to safely slow down to the speed limit before the jammer automatically disables and allows a speed reading. This is ideal, since you will not even have to remove your hands from the steering wheel to press a button.Whats next?Now that radar and laser speed enforcement are popular, the public is becoming aware that companies like us have developed solutions to them. Naturally, they have taken the next step in the cat and mouse game and have begun developing new technology.Automated speed cameras? Multaradar and MRCT radar? Dont worry, weve got that covered too. Learn more here! 21st Jan,2019 A police laser (or lidar) gun is generally the device thats used by traffic enforcers and policemen to measure the speed of cars on the road. It is commonly called a speed gun, but officially, it is called Police Lidar which means Light Detection and Ranging. Other types of speed guns are used for professional sports as well, including baseball (pitching speed), tennis (serving speed), cricket (bowling speed), and other speed of athletes.The Police Lidar is an accurate device that gives fast feedback. Its much easier to use that the older Vascar (. Upon hitting the trigger, the police can immediately get the speed of the vehicle it is targeting. The gun shoots out a focused beam of infrared that accurately measures speed up to the 10th of an MPH.How does police lidar work?People often mix up police lidar with police radar, but these two have different ways of measuring speed, although they have been used by traffic officers as speed measuring gadgets. The police lidar uses an infrared beam and the Doppler Effect to compare the difference in the frequency and then, of course, calculate the speed. A radar, however, sends out a radio pulse instead of an infrared. It then calculates the signals Doppler shift to measure the speed. The accuracy of the police lidar comes from the thousands of time and distance samples that have been taken, as well as the available complex algorithms. It measures time the light makes the roundtrip time to a car and back, which is achieved in less than a second. Its because the laser light moves 1 ft (30 cm) per nanosecond or 984 million ft (300 million meters) per second.The laser gun counts how long it takes a roundtrip then calculates the distance of the car using that information. In one second, the police lidar can get many samples and compare the change in distance between samples to get the speed of the car. The ability of police lidar to take hundreds of samples in just a fraction of a second makes it high in terms of accuracy.Advantages of Using LidarPolice lidar has been used for traffic law enforcement for a very long time, and although it has been around for many years, it has been updated continuously. The updates were necessary because detectors have been able to easily detect the presence of lidar guns. The newest versions of police lidar were targeted to be more invisible from radar detectors, although the leading ones are still working. For traffic enforcers, here are some of the advantages of using police lidar over other speed capturing devices:Much harder to be detected by radar detectors.The longer range of detection than that of a radar gun.Speed calculation is precise (as precise as 10th of an mph)Precision allows police to apprehend much faster and easier.Radar detector users arent usually warned with a police lidar presence.Although these advantages put the police laser/lidar ahead of the radar gun, there are still a few police that uses radar gun and even catch speeders with them. But the laser/lidar gun is much more utilized in many places now.How Drivers Detect The Presence of a Police LidarRadar detectors have been around for a long time too, as they are great devices to detect if any police are calculating their speed. But as radar detectors have been too good at warning the drivers, the upgrade of police enforcers into laser guns was implemented. Some brands have incorporated a LIDAR detector in their radar detector models. Nowadays, almost all trusted radar detector models carry a laser detecting capability in their features.But aside from radar detectors that can detect laser, people sometimes use laser jammers too. Despite laser jammers being illegal in many states in the United States and many other places in the world, some still try to get away and hide them to lessen their chances of being caught by traffic enforcers. Laser jammers dont only alert the driver when theres a lidar gun in the area, but fires back to the police officer jam his LIDAR gun and block it from detecting your vehicles speed. A safer way to know the presence of a police lidar in a particular place is through a community threat-sharing features. Some radar detectors have this feature, which is often accessed and utilized by connecting your device with your smartphone. Some of these community threat-sharing apps include the Cobra iRadar and Escort Live plus a few free apps (tap for our list), wherein drivers can report their sightings of speed traps, red-light cameras, or LIDAR gun.ConclusionPolice lidar is very effective in calculating the speed of a moving vehicle, and its accuracy is impressive as well. However, although it boasts of an upgrade in the detection department, it still isnt invisible to radar detectors, especially the newer models. Although there can be advantages on the part of drivers using radar detectors, take note that lidar technology is an ongoing development.Even though until today, most reliable radar detectors can detect and laser jammers can mess with the police lidar gun detection, there might be a coming upgrade so that the police can easily apprehend those who are speeding and breaking the law. But for those with an advanced radar detector and laser jammers, the security of not being able to be given ticket is higherbut remember that the safest way to not get caught is to no speed at all. William Johnson is the owner and founder of RatedRadarDetector.org. He writes about car accessories, with his passion stemming from a deep enthusiasm for all things automotive. His website, RRD, focuses on in-depth reviews of car accessories to help people find the best and latest products in the market. Police laser guns are a common tool that police officers use to issue speeding tickets all across the United States and Canada. They offer many advantages to a police officer over a radar gun and radar detectors dont actually help against a police laser gun. Laser jammers are required to combat laser guns. How does police laser work and what do you need to know about it to avoid speeding tickets?Police officer shooting laserPolice Laser Gun OverviewUnlike police radar guns which send a big blast of radar waves down the road that anyone running a radar detector can easily pick up on ahead of time, police laser (or lidar) guns send a pinpoint beam of light thats specifically aimed at just one vehicle at a time. This has the advantage of making it easier for the officer to tell which vehicle he is getting a speed reading from as well as not providing advanced warning to oncoming drivers running countermeasures like radar detectors.Police laser gun pinpointing a specific vehicleThe laser beam is very narrow (typically a mere 18 wide at 500 ft away) which makes it easy for police officers to target a specific vehicle and quickly identify which vehicle is producing the number on screen. This is especially useful in heavy traffic when lots of cars are around.Because the laser beam is so narrow and thin, radar detector users typically wont get any advanced warning before theyre targeted. An officer could be targeting the car next to you, ahead of you, or behind you, and your radar detectors laser detector wont be able to pick it up. Heck, its even possible for you to get targeted and your radar detectors laser sensor may not see it at all. Even if it does, by the time your radar detector goes off, its little more than a ticket notifier.Lets take a little closer look at how these police laser guns work.Note: Laser and lidar are used interchangeably. Lidar stands forLight Detection And Ranging.Tour of a police laser gunWould you like to see a police laser gun in action and see what the police officer sees?Heres a quick look at one popular laser gun, the LTI TruSpeed S.Next heres the TSS being used to issue tickets. First up is a vehicle behind me that gets nailed for speeding. Youll notice that my radar detector (Valentine 1) and laser jammer (Blinder HP-905) never goes off, even with the LEO shooting right over my shoulder.and heres a second encounter with me getting shot with laser from behind. I found an officer marked on Waze and wanted to watch him in action to see how he worked. When he finished writing one ticket and got set up to continue clocking vehicles, I drove past him. While driving, I accidentally missed a shift and instead of going from 2nd to 3rd gear, I went from 2nd down to 1st and inadvertently revved my engine as I passed. Whoops! He definitely noticed this, turned towards me, and shot me from behind to see if I was going to speed away. My laser jammers (AntiLaser Priority) went off instantly and I quickly killed my jammers to let him get a speed reading on my car. My radar detector (LRD950) never went off.Usually police officers will shoot laser from a handheld laser gun like this and chase you down themselves to give you a ticket.Other times theyll be set up somewhere shooting and someone else will be issuing the ticket. There may be some chase cars up the road ahead and the officer will radio in to vehicles up the road and theyll make the stop instead. Another option is that there could be a camera hooked up to the lidar gun and instead of making a stop in the first place, the police department will simply send a ticket in the mail.Handheld laser gun with a camera attached to the sideHeres a quick look at how this looks from the drivers point of view. This was up in Edmonton, Alberta. My radar detector (Stinger VIP) alerted me to a known speed trap where police commonly hang out and when I got shot from behind, my laser jammers (AntiLaser Priority) went off from behind and again I immediately killed my jammers to let him get a speed reading. (If youre wondering why Im killing my jammers, something thats very important to do,read this.)As you can see, laser is commonly used to target both the front and rear of vehicles (front is typically far more common) and police officers love using it in areas with higher levels of trafficHow do police laser guns calculate your speed?So how do these lidar guns work?Well if you look at the business end of a lidar gun, youll see two lenses. Behind one lens is an infrared (not visible light) laser transmitter and behind the other lens is a laser receiver that detects the laser beams reflections coming back.Lasers use light and we know the speed of light (roughly 186,000 miles per second). When we send a quick pulse of light out, it will travel from the lidar gun, to the target vehicle, and back. If we measure how much time it takes to get a reflection (time of flight), we can calculate how far the light had to travel. Because the laser beam had to make a round trip to the car and back, if we divide that number by two, well get the distance between the lidar gun and the target vehicle. Thats step one.Now one pulse will give us distance (not speed), but if we shoot a whole series of pulses, we can determine the change in distance over time which will tell us the vehicles speed. (Speed is simply a measure of distance divided by time, ie. feet/second or miles/hour).If its a little confusing to understand by reading, heres a video where I explain this visually and go into more detail.In short, the lidar gun is sending out a constant series of pulses, waiting for the reflections, and with a little math it can determine a vehicles speed, distance, and direction of travel.What areas of a vehicle do police officers target?Laser guns require a reflective target to get a reading off of so police have several primary targets that they aim for when clocking moving vehicles. These include:Headlights / tail lightsGrillLicense plateThose are shiny and reflective targets that make it easy for a laser gun to get a speed reading.Modern laser guns can get a reading off of most anywhere on the car including your bumper, body panels, and so on, but police will generally target the most reflective targets.What are the differences between radar and laser?Police laser is different than police radar. Heres some of the main ways that laser is different than radar:Police officer must be stationary when using laser. With radar they can be stationary or moving.Laser makes it easy to pinpoint a specific vehicle in traffic.Laser guns must be held up to the eye so the officer can aim.Laser doesnt provide radar detector users with advanced warning.Laser is effective against radar detectors.Laser can be jammed by laser jammers.What do handheld laser guns look like?Laser guns come in several different form factors. Here in the US youll almost always encounter handheld guns, typically shaped sort of like a pistol.Here is the Kustom ProLaser III, the most common police laser gun in use in the US.Youll notice that with the PL3, the lenses are set up in a side-by-side configuration. Other laser guns are designed with the lenses stacked on top of one another such as the LTI TruSpeed.Some older guns like the Kustom ProLaser II had one lens actually inside of the other, but this is an older design thats not really used anymore.Some laser guns are shaped less like a gun and more like a set of binoculars. The LTI TruSpeed S is a good example.As with all handheld police laser units, they need to be held up to the eye to be used, allowing the officer to look through the viewfinder and place the crosshair directly onto the desired target.What do photo laser guns look like?Photo laser is a little different. Its basically a police laser gun integrated with a camera and instead of chasing down a speeder, an officer will take a photo and mail the vehicle owner a ticket. Lets take a look at what photo laser guns look like.The easiest way of doing photo laser is to simply combine an existing laser gun and camera and put them together such as with the Kustom LaserWitness Lite.This can be a bit bulky so laser gun manufacturers also offer cameras built directly into the laser guns for a more compact setup such as in the LTI TruCam.There are also some unmanned photo laser setups available too. Since you dont have a person actually aiming the laser guns at specific vehicles, they are set up in a way where they can scan multiple lanes of traffic automatically. Heres an example with the Polican.Youll notice in that photo, the laser gun is installed in a pole along the side of the road. This is a fixed photo lidar setup.They also have mobile photo lidar setups that can either be set up on the side of the road or installed inside a vehicle parked next to the road.Photo laser is much more common abroad. Here in the US its mostly handheld laser that youll see in practice. There is some manned photo laser and even less unmanned photo laser here, but the vast majority is normal handheld laser.How accurate is laser?Because laser guns are being used to issue speeding tickets and their readings have to hold up in the court of law, they have to be accurate. Police laser guns are generally accurate down to +/- 1 mph or +/- 2 km/h.In order to ensure that the gun has a good lock, it has to get a bunch of return pulses that all make sense. Getting just 2 or 3 pulses isnt enough. Laser guns typically take about 0.3 sec to get a lock on a vehicle and for an example laser gun that fires 200 pulses per second, this means it needs 60 return pulses to get a reading.As a vehicle moves towards or away from the gun, the distances should all make sense something like 1000 feet, 999, 998, 997, 996, and so on. Its only with a smooth set of distances like this that the gun can ensure that its locked onto a single target, it has a clean lock, and so on.How do laser jammers work?Modern laser jammers actually exploit this requirement. What they do is when they detect that a police laser gun is firing at them, they send back their own laser pulses that make absolutely no sense to the gun. What the laser gun will see is distances that look like 1000 feet, 350.2, 26.4, 125.7, 553.8, 300.1, etc. A laser gun looks like that and has no idea what to make of it, so it displays no speed and continues to fire, waiting for a series of return pulses that make sense.For more information about laser jammers, watch my videos on how smart laser jammers work and how brute force laser jammers work.How far away does laser work?How far away can a laser gun acquire a speed? It depends on a variety of factors such as the design of the specific gun, how large the target vehicle is, and even how stable the police officer is (if theyve got more handshake or theyre shooting in the wind, it can be tougher to keep a solid lock on a small vehicle farther away).If you look through manufacturer spec sheets, youll typically see maximum distances listed on the order of 2,000 6,000 feet or so.However, in some areas, theres actually laws regarding how far away officers are legally allowed to shoot, independent of what the gun is capable of. Sometimes they have to shoot within 1,500 feet or less, for example. One reason for this has to do with beam divergence.You see, the laser beam actually starts to widen (diverge) as it travels through space. It doesnt stay a tiny, fixed dot forever.The exact amount that the beam diverges varies from gun to gun, but a beam divergence of around 3 milliradians is pretty common. This means that 500 feet away, the laser beam will be 18 wide (US license plates are 12 wide). 1,000 feet away, the beam is 36 wide. 2,000 feet away, the beam is 72 (6 feet) wide.If you start shooting too far, you increase the likelihood of thinking youre targeting one car but actually getting readings off of the car next to it. This is why some police departments limit the maximum range that officers are allowed to shoot. They want to ensure that when an officer says they got a reading on a particular car, theres no concern that they inadvertently got a reading off of a different car.Not only that, but as you go farther away, the target gets smaller, handshake gets magnified, and sometimes the crosshair itself will actually completely obscure the little speck of a vehicle at a distance. Magnified viewfinders and tripods / leaning against a vehicle can help, but theres still practical limits. While it is possible to get readings off of vehicles thousands of feet away, and bigger vehicles make this easier, laser is generally something youll see at closer distances.Does poor weather affect laser guns?How does rain or snow impact the laser guns ability to get a speed reading? With all the extra precipitation in the air blocking or even reflecting the laser beam, it can be more challenging for a laser gun to get a reading. Its for this reading that many laser guns actually have a poor weather mode.What that does is reduce the minimum range that the gun can get a reading from so that it ignores any very close readings (ie. a big fat rain drop a few feet away from the gun). For example, when set to poor weather mode, the laser gun may require the vehicle to be 200 feet away or more in order to be able to be measured. This ensures that the laser gun is only measuring targets beyond the range of where rain and snow can affect the lasers ability to capture a speed reading.Laser can also be operated within a vehicle and shot through a window or windshield so yes, even if its raining out, police can still user laser.Are some vehicles harder to clock with laser?People often ask if some vehicles are harder to get a reading off of than others. Are black cars harder to get a reading from because theyre less reflective, for example?Modern lidar guns are really good at getting a lock on a vehicle. Any vehicle. Even motorcycles. Older guns used to struggle with this more, but modern guns have no issue getting a lock on cars, particularly at close range which is how laser guns are designed to be used. That said, some vehicles are a little easier or harder than others.Vehicle typeSome of the toughest cars to get a reading on would be low profile sports cars. Big SUVs and vans are much easier to get a reading off of, especially at a distance when the target is smaller. You can probably guess why. When you have a big target, its easier for a lidar gun to get a reading. Sports cars usually have a smaller wedge-shape up front for improved aerodynamics and so the smaller target area can make it tougher to get a lock on the vehicle, especially at a distance, and so it may take a little bit longer to get a reading off of some vehicles than others, but the gun can definitely still do it.Front vs. RearIts normally easier to get a lock on the rear of a vehicle. The front is usually angled and more wedge-shaped to minimize wind resistance while the back is usually pretty flat and perpendicular. The large perpendicular rear of a vehicle is easier to get a speed reading from than the front. Plus everyone has (reflective) license plates in the rear while front plates are only required by some states.Vehicle colorPaint color doesnt make a big difference to laser guns, not anymore anyway. Whether the vehicle is black, white, or silver, a laser gun will be able to get a reading off of the car.How to Defeat Police Laser?As drivers, we may want to have defenses to protect us from laser guns. I recommend having multiple layers of protection to help swing the odds into your favor. What are the different options available, both effective and ineffective, and how well do they work?Radar detectorsRadar detectors have laser detectors built into them so they can alert you to laser up ahead, but in practice theyre nearly useless. Against police radar, sure youll get advanced warning and theyre great for that. Laser is a different animal and you generally wont get advanced warning against laser guns.With laser, your radar detector will typically only go off when the officer is targeting you and by then its too late. By the time it goes off, hes got your speed and your radar detector is little more than a ticket notifier. Great Heck, often times you can get shot and your radar detector wont even go off at all. Thats super common too. With laser being such a thin beam, since your radar detector is installed up on your windshield and hes aiming down at your grill somewhere, the radar detector is too far away to even see the beam.Some people may want to run their radar detector low on their windshield to help increase the odds of detecting laser, but this will diminish radar detection performance and again, even if your radar detector does go off, hes already got your speed anyway so that really wont help much.Now it is possible to sometimes get advanced warning against laser, especially with a very sensitive laser detector in your radar detector. The laser beam can bounce and reflect off of a vehicle thats getting shot ahead of you and you can get alerted before youre the one being clocked. This is known as scatter, but it is extremely rare and is in no way a reliable way to protect yourself from speeding tickets. Theres better solutions available than a radar laser detector.Laser jammersLaser jammers are the best tool you have to combat laser. They are specially designed devices installed in the grill area of your car that not only detect laser like a radar detector, but they also fire back and jam the laser gun, preventing it from getting a reading. When you get shot, the alarms start going off in your car, you slow down to the speed limit, kill your jammers, and let them get a reading off of your car, and you go on your merry way.There are a number of different laser jammers available. However, the best and most effective laser jammer on the market is the AntiLaser Priority. You can read my review of the ALP here.Laser jammers do need to be installed properly in order to be effective. Many people actually do it wrong and wind up installing them in a way where they cant provide adequate protection. Its for this reason that Ive put together a comprehensive laser jammer setup guide to help walk you through the process so that you can avoid all the common mistakes and have an effective laser jammer setup.People often ask about the legality of laser jammers as well. Laws vary from state to state, so check out my article on laser jammer laws if youre curious.Laser scramblersTheres a company called Rocky Mountain Radar which sells radar detectors with a unique feature they call scrambling which is essentially a passive jammer. It functions different than a traditional jammer, but it actually doesnt work at all. RMR is considered to be one of the biggest scammers in the industry and they prey upon innocent customers by advertising a bunch of nonsensical technobabble to try and confuse people, but in reality their products are snake oil.If youd like to see for yourself, Ive tested the RMR C495 against different police lidar guns, Ive tested theRMR Judge against police lidar guns, and Ive put the RMR on an oscilloscope alongside a laser gun and an actual jammer to show the difference between how they operate (the RMR doesnt actually emit anything).The scrambling functionality is nonsense and the company isnt being honest with you. Stay away.Veil laser absorbing paintSpeaking of passive laser protection, another option is Veil. Its a laser absorbing paint that you apply to the reflective areas of your vehicle including your headlights, fog lights, and license plate if applicable. The idea is it absorbs laser, preventing the laser gun from getting a reading for a few seconds, long enough for your radar detector alert (assuming it does) and you can slow down before he gets a reading. Good idea, but unfortunately it has a number of serious issues, even besides the fact that it isnt effective.The previous generation of Veil (G4) had issues with cracking peoples headlights. Veil changed their formula with G5, but it was so dark that youd have bigger issues than dealing with laser guns. If you look at the photo above, the problem is obvious.The formula has been changed yet again to make it lighter, but unfortunately that doesnt change the fact that Veil simply isnt effective at preventing laser guns from getting a reading. You can take a look through several different independent tests (Veil Test A, Veil Test B) and youll see for yourself. Ive run both the old version and the new version in the past before and, well, I definitely dont run it anymore.Against areas of your car where Veil is applied, laser guns can get a reading. Even it could block laser guns, against the parts of your car where Veil cant be applied, such as your bumper or body panels, laser guns can get a reading too so even if it did work, theres still some big problems with the product that formula changes wont resolve.Im all about having several different layers of protection to all complement one another. Veil is less than $100 so its not a lot of money, but unfortunately its nevertheless a poor investment. Not recommended.License plate coversAnother option to help keep you protected is to put a laser diffusing license plate cover over your vehicles license plate. The idea is that even if its not going to fully protect you from laser guns, every little bit helps, right?Ive had a chance to test these out twice before and found that laser guns are still able to get a reading off of a license plate covered with these covers.Not recommended.WazeThe last thing Im going to talk about is something I actually do recommend, running a cloud-based alert sharing app likeWaze. Waze is a free GPS navigation app like Google Maps, but the killer feature is that it allows you to report where police officers are as you drive. See an officer set up on the side of the road running laser? Mark him in Waze and alert everyone else running the app. Theyll do the same for you in return and so everyone wins.Since police officers have be stationary when running laser, unlike when theyre using radar, Waze is an excellent countermeasure for laser.Its certainly not a replacement for laser jammers. Rather, its a complement to it.If an officer just arrived and hasnt been marked in the app yet, if its dark at night and no one can see him, or for some reason hes not in the app yet, your laser jammers will provide you with the save.If hes marked on Waze but youre only running laser jammers up front and he shoots you from behind, your laser jammers wont help but Waze will save you.Theres also times with both of them will protect you, so its all about having multiple effective layers complementing one another to help you improve your odds.Escort LiveFinally, theres another app called Escort Live which is very similar to Waze, except that its designed to integrate with Escort radar detectors. The idea is that when an Escort radar detector gets a legitimate radar or laser alert, it will post that to the cloud automatically (unlike Waze where you have to report police spotted manually) and every driver in the area can benefit.Personally I find that Waze has the edge in alerting simply due to the fact that it has way more users reporting information, but both apps can help so you can run one or both apps backgrounded and hear the audio alerts through your phone when they are present.If you have an Escort Live compatible Escort radar detector like the iX, Max360, or Redline EX, those Live alerts can pop up on the face of your detector so you dont have to pay attention to your phone, a nice little advantage.Escort Redline EX alerting to Ka and Laser alerts ahead via Escort LiveConclusionPolice laser guns are an effective and deadly tool that police officers can use to issue speeding tickets. Learning a little bit about how they work will provide you with more understanding regarding what youre up against and how to defeat it.When properly equipped with the appropriate countermeasures including a good laser jammer and Waze, laser is really no big deal. Heck, grab a dashcam too and then youll be able to share videos all the fun laser encounters that you experience out on the road.Happy driving and drive safely out there! This website contains affiliate links and I sometimes make commissions on purchases. All opinions are my own. I dont do paid or sponsored reviews. Click here to read my affiliate disclosure. Skip to main content Reddit and its partners use cookies and similar technologies to provide you with a better experience. By accepting all cookies, you agree to our use of cookies to deliver and maintain our services and site, improve the quality of Reddit, personalize Reddit content and advertising, and measure the effectiveness of advertising. By rejecting non-essential cookies, Reddit may still use certain cookies to ensure the proper functionality of our platform. For more information, please see our Cookie Notice and our Privacy Policy. The police laser gun is referred to as the Police Lidar, which is an acronym for Light Detection and Ranging. In short, when the police officer triggers the laser, it emits a highly focused infrared beam that is very accurate. So accurate that it can determine your vehicles speed to the 10th of a MPH.Tackling the improved radar detectors that brands such as Valentine, Cobra, Escort and others are developing means the police had to improve their technology too.It is often mixed up with a police radar but the police lidar measures the speed of a vehicle by the infrared beam at the target vehicle, which then gets reflected back to the gun. Using the Doppler effect and comparing the difference in frequency from the original frequency, the speed can be calculated.Why is Lidar Better than Radar?Police Lidar has been around for many years but has been improved over the years with the latest being very hard to detect. Below are some of the advantages of police lidar when capturing speeding vehicles:Harder to detect by vehicles using radar detectorsFurther operating range than RadarMore precise (up to a 10th of a MPH)Easier convictions due to the precisionNo warning to radar detector usersEven with all these benefits, the police still use the radar and are still catching many speeding motorist this way too. Many people also use laser jammers to avoid getting caught by a laser gun too, which is why using both will improve their chances of catching a speeding vehicle. Unlike the radar jammer that is illegal in every state, the laser jammer is not and is quite common.However, a police officer using a laser detector must be stationary whereas a police radar can be used whilst on the move.Does Police Lidar Work at Night?The old myth that the laser gun will not work during the night is simply untrue. Police lidar does work during the night as it emits its own light and it does not need anyambient light to operate. However, just like the radar, lidar does have slight issues with heavy rain and snow but this does not mean it will not always work of course.How Does Lidar Work?Lidar operates in a similar fashion to a police radar by using the Doppler effect and comparing the difference in frequency against the original transmitted. The laser gun uses an infrared beam that travels at the speed of light, which then hits your car. The beam is then bounced back to the device and the calculation of the amount of time it took to come back is made.The police lidar is very accurate and this is thanks to the thousands of samples of the time and distance taken and the complex algorithmic calculations. All of this is achieved in less than a second.ConclusionRadar guns are much easier to detect than a police laser, which is making police officers jobs much easier. At ProCarReviews, we are working hard to find the latest radar detectors that detect lidar technology just as well as the police radar. The likes of laser scramblers and laser jammers can be a pain for many police officers and can result in the laser gun being unable to get a reading.Laser guns do require the police officer to target a reflective target such as the grill, headlight, license plate and other shiny areas. This makes the readings much easier to achieve but police forces with the latest laser guns can target anywhere on the car.For those that want to learn more about the police lidar, the below video goes into much more detail and why the technology is working so well. Alternatively, read our article on what are the radar detector laws.

How does laser speed detection work. How does a laser speed detector work. How does police laser speed detection work. Do radar laser detectors really work. Do laser detectors really work. Laser speed detector accuracy.