Angel G7: Review
An in-depth review on WDP's latest creation
Also featuring a G7-'05 Speed side-by-side comparison

Introduction:

Since the first Angel was released, innovation and refinement have continued to drive WDP in their efforts to produce the most advanced electronic-pneumatic marker in paintball. Over the past six generations and totaling almost nine years, WDP has continued to produce a caliber of marker that has remained unmatched. When you think of an Angel, you think of quality, reliability, performance, speed and perfection. Despite the increase of markers on the tournament circuit and the highly competitive nature of marker manufacturing, WDP has stuck to their roots the whole time. The G7 is no different, as its release marks the seventh generation Angel from the large, industrial town just south of where the M5 and M6 meet. WDP's Angel division, under the technical design of John Rice, has developed a faster, more 'efficient' package as it is dubbed. The release of the G7 marks the end of the A4 platform, arguably WDP's most successful marker yet due to the popularity of the Fly and the Eye-Q system. Not to worry though, the Angel LCD, which was discontinued in 2003, still has an abundant stock of accessories and factory components still available at all major service centers.

For those of you that have been living under a rock since the fall of 2004, you're probably unfamiliar with the G7. Likewise, you probably also believe that it's a '05 Speed with an LCD display and a different body. This review will attempt to change your perspective, as you'll see that the G7 takes only the platform from the '05 Speed and will completely redefine how speed is measured. In addition, a section will be devoted to a side-by-side analysis of a '05 Speed and the new G7.

We'll begin with a nuts & bolts look into the marker, showing you what's under the hood and what's been redesigned. Then we'll move onto field performance, efficiency and maintenance expectations. Finally we'll conclude with the side-by-side analysis of the two markers and let you decide which one is right for you.

Nuts & Bolts
To start, the G7 is based off the '05 Speed platform. WDP's design team revamped the trigger frame and inline regulator design last spring with the release of the second

generation Speed. The new look, features a more ergonomic feel. Most notably different about the new design is the one-piece fore grip with a mini-reg cartridge and the EMF, dual-magnetic, trigger design.

While the G7 still garners the same twist-lock clamping feed neck and Eye-Q hardware, that's about all this marker carries over from the '05 Speed design. Even the internals are radical different, however much of that is unseen to the average user unless the marker is disassembled.

We'll work front to back on the G7, providing you with weight measurements, schematics and finally with a side-by-side "multi-angle" view of each component next to a similar '05 Speed component. The G7, much like every other Angel is broken down into the following five "primary" components: Electronics, Pneumatics, Interface, Aesthetics and Performance. Within these five categories are the following ten "physical" components: Low Pressure Regulator, Exhaust Valve System, Ram and hammer, Solenoid, Inline regulator, PCB (board and wiring), Trigger system, Detection system, Bolt and Battery.

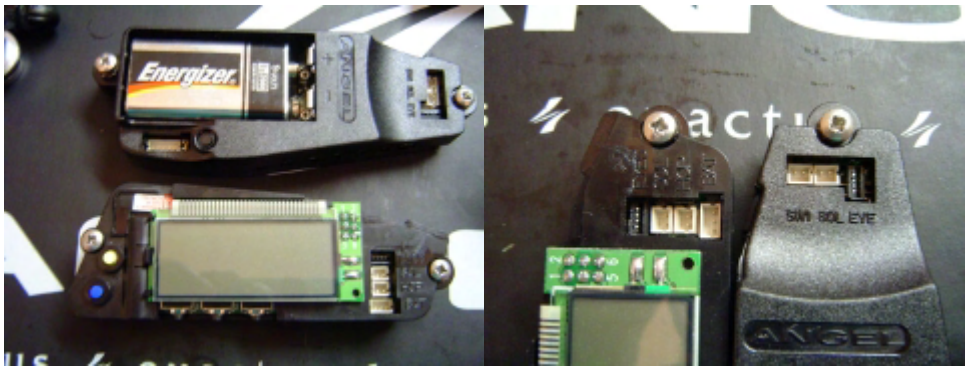
Our first look will be at the electronics system:

Board
The most distinguishing characteristic of the G7 is the board and the LCD display. The LCD display has been a staple on the Angel flagship model since the Angel LCD (2nd generation) was released in August of 1997.

The LCD display was originally criticized as being too extravagant of a design for a paintball marker but it's been a common design feature on several high-end tournament markers over the years. One of the nicest features of the LCD is the ability to see exactly what is being displayed without having to interpret LED lights. As the Angel has advanced, so have the internal menu options. WDP has identified this by providing you with two menu options, basic and advanced. The advanced menu allows you full control over all the available options on the board. However some features can only be modified using the internal menu buttons the external menu buttons. The basic menu is a simpler version of the advanced menu but with fewer options.

With the LCD screen active you'll always have the battery display meter available as well as the three blocks for the timer alarm status (A1, A2, A3). The battery meter is usually a pretty good indicator, however it is designed to be a gauge and it is recommended that you charge your battery based on frequency of use.

The board itself is still housed the plastic PCB, designed to protect the integrity of the board from electrostatic shock. The IR interface on the rear of the board has been added to the board again, allowing for the ability to send/receive marker settings between other G7s.

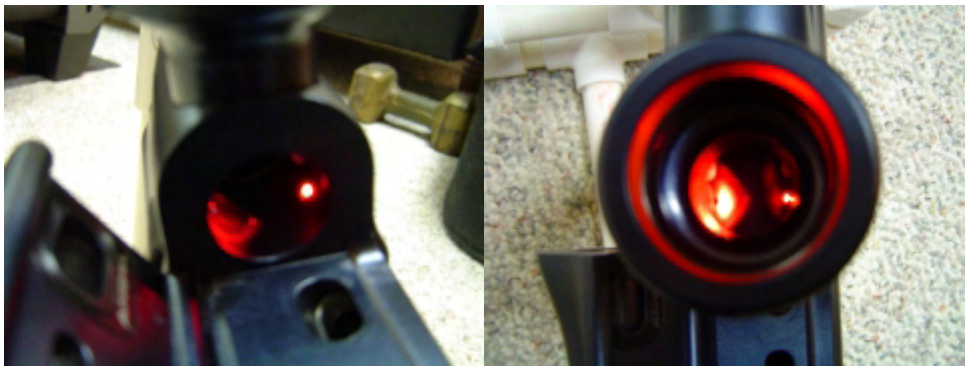


Wiring & Laser Eyes
Most people don't look at the quality of wiring or the wiring design of markers when they go to purchase one, however it's usually the first problem people find with a marker when it stops responding. Wiring is probably the most critical element in an electronic marker when it comes to performance. There are three primary wire segments underneath the hood of the G7, the solenoid wire, the switch/battery wire and the break-beam eye wire (which is actually a ribbon). Although it took WDP a while to integrate a break-beam system into their marker they revolutionized the design of the break-beam eye by using a ribbon cable versus a traditional plastic wrapped copper wire.

WDP's wiring is firm, their soldering onto connectors is clean and secure and the internal passageways for the wiring to travel are clear and defined. Out of all the markers I've seen in shops or on the work bench, WDP continues to excel and set the tone for quality of manufacturing in the electronics category.

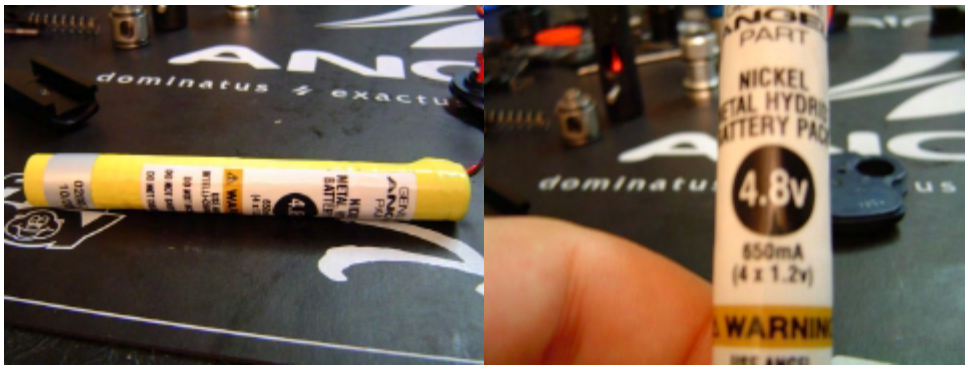
The G7 features the laser eyes made popular by the recent upgrade made available before the G7 was released. They were actually called the "G7 eyes." However, don't get too excited the eyes in the G7 are nothing special in terms of their performance or design. In fact they're identical in every aspect to the eyes found on the Fly and '05 Speed. The difference is in the beam; WDP has designed the beam to be seen by the naked eye. Its frequency is 428,570 GHz, which can also be stated as 428,570 trillion cycles per second. So when you look at red light, your eye receives over four hundred trillion waves every second!

More importantly the visible light gives you an indication if the eyes are working. For instance if the marker is in Live and the eyes are disabled the visible light spectrum will turn off, or if the ribbon has become damaged and no longer sends a signal to the board.



Battery

Another principal design in the Angel G7 is the rechargeable NiMH battery. The battery stack design has continued to evolve with the Angel despite the fact that the majority of electronic pneumatic markers use a 9v battery power supply. The battery is still charged using the intelli-charger that comes with all Angels and still designed to be used with the cigarette lighter adapter for vehicles. The battery is a 4.6v 1800maH battery designed to give approximately 150,000 cycles before a recharge is needed. A full charge takes about 3 hours and the battery was designed to withstand frequent charging without developing a memory effect. However, care should be exercised to only charge the battery when it's low. The weight of the battery has been reduced 1oz from the A4.



Eye-Q system
The Eye-Q system is WDP's name of the anti-chop detection system found in the G7. The logic remains unchanged in the G7, outside of the hopper speed settings that are programmable on the board. The eye logic automatically adjusts to the speed in which hopper is capable of feeding paint, however it is advised that you set your hopper speed up to complement your loader speed.

Moving past the electronics we'll now tackle the pneumatics system:

Low Pressure regulator & Exhaust valve
The LPR and Exhaust Valve system are two more principal design aspects of the Angel that over the years have remained fairly constant. The LPR's main purpose has been to power the ram back to the rest position. Often confused as "operating pressure" the LPR pressure is usually between 40-60psi on the newer style Angels (post-IR3). The lower the LPR pressure the less forced used to return the hammer and usually the less kick of the marker.

The biggest improvement in the LPR is (again) the gas gallery of the main piston. The piston air channel has been dramatically increased, so you'll need a new piston removal tool. In addition the shims on the LPR piston have also been redesigned to allow more airflow and more wear and tear. However the pressure fluctuation shims still remain the thin paper-like material.

The G7 came with 11 shims, bringing my LPR pressure to 82psi out of the box. Immediately upon identifying this setting, I removed 3 shims to bring the LPR pressure down to approximately 65psi. After the marker has been used extensively (8-10 cases) I'll most likely adjust the LPR down to a low enough setting where performance is not compromised. Thus far it appears as though that magical number is around 40-45psi. A fellow technician was able to run his LPR @ 38psi without modification. I'll be very curious to see if the LPR can handle 30psi.

The LPR's overall design has remained unchanged; you can still remove the main seal for rebuilding purposes after extensive use. However it is unlikely that you'll ever have to work on your LPR unless there's an issue after heavy use or debris has entered the main body.

Now for the exhaust valve system, which sees another facelift and a component removal that's been part of the Angel's design since 1997. The exhaust valve system has been dramatically overhauled to allow for the increase in airflow throughout the entire marker and recovery rate. First and foremost, the spring has been entirely removed from the exhaust valve system, never seen before in Angels. In its place is a two-piece component on a pin and bobbin system. This pin also supports a redesigned, elongated exhaust valve stem. It appears as though the days of replacing exhaust valve stems every 70-80k cycles is gone. Based on the design it looks as though the entire system is designed to be friction free (or close to) and that the exhaust valve stem seal can be replaced on the fly without replacing any component. The seal is a two-piece design, one seal for the gas gallery side and one seal on the valve guide side. The top of the bobbin is secured to the end plug, so

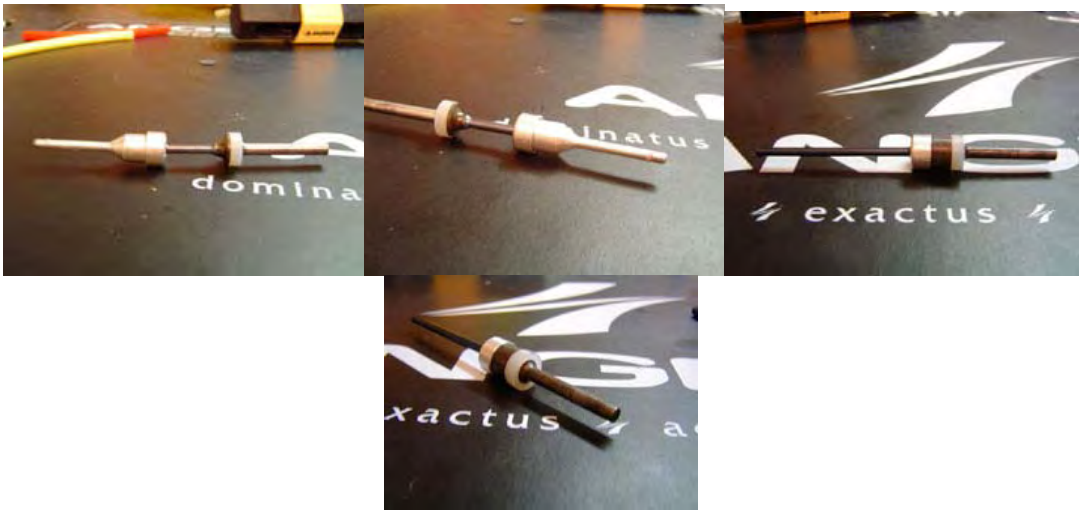
at this point in time you won't be able to use any volumizers with the G7. I'm sure there is a component being designed to work with this new exhaust valve system.

**** Update ****

It appears that WDP has revamped the original design of the exhaust valve system. New G7s (.45 & .90 frames) are shipping with a slightly different valve stem bobin. The design appears to be more streamlined. The steam is no longer a tapered design and the actual rod is a one piece design. After speaking with master tech Ken Crane of Performance Angel I clarified:

"They recently changed the design to one of the new variants, photo 4 & 5 is what the newest variant is. Reasoning behind it? First of all it was easy to produce and after R&D on the component WDP determined that the "wings" on the spring rod were not needed. Originally designed to ensure the rod stayed centered at all times it was later determined that the rod would stay centered on its own without the wings. By eliminating this area of the component it would also eliminate any potential friction caused by the wings.

Does this mean the original design is inferior? Absolutely not. In no way is the new design any better in terms of performance, reliability or even operating pressure. No need to panic, freak out, complain or request a product swap." **(Response courtesy of Ken Crane)**



Lastly, is the revamp of the exhaust valve guide. The guide itself has remained unchanged in principal. The valve stem passes directly through the guide and is pushed open when the hammer cycles forward to hit the valve stem. As the valve stem is pushed out of the guide the air from the exhaust valve gallery is released to power the paintball out of the firing chamber. This is where the dwell comes into play, as the time duration in which the hammer keeps the valve hammer is measured in dwell time (milli-seconds). As the hammer retracts to the rest position the exhaust valve gallery is pressurized and the LPR pressure readjusts to the predetermined pressure range.

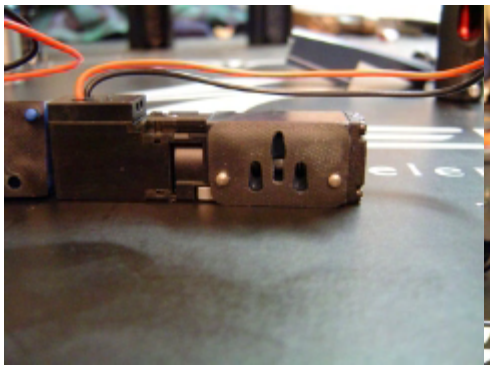
Although it's difficult to see just how different the exhaust valve is from the breech, you'll notice immediately upon removing the component that it is much longer. In addition to being longer the gas galleries have been increased dramatically. The amount of airflow improvement here and the channel to the breech is incredible. More volume, less pressure!

Solenoid

Onto the solenoid, the true electro-pneumatic component of the marker, which still resides behind the bolt and above the ram chamber in the body. However, the solenoid design has been turned sideways to allow for the redesign of the body profile. The solenoid itself is smaller, shorter and advertised as being the best yet from WDP. It's still a 3v solenoid but the air channel into the valve is much larger and the solenoid is rated at better handling the high ROF demand.

The solenoid no longer has the three components used to regulate the airflow from the marker to the solenoid. Now the solenoid only has the main gasket seal and the solenoid secures to the marker directly.

Chances are you'll never have to do anything with the solenoid during use and you should never have to disassemble the valve within the solenoid. Another thing I noticed was the sound of the solenoid, the pitch is much different. The sound was similar to that of Shocker/Matrix.

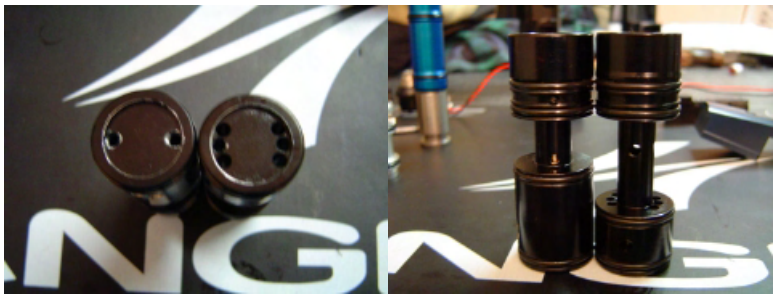



Inline regulator

From the outside, you'd think the mini-reg was identical to the one on the '05 Speed. Outside of the rubber grip (a sticker, really), externally the fore grip looks identical. WDP has gone towards a more traditional macro-line elbow versus the "death grip" macro-line elbows. When the '05 Speed came out the entire mini-reg was redesigned and switched over to a one-piece fore grip and the mini-reg went to a cartridge. However, what really separates the G7's internals here is gas galleries. The internal air passages on the internals here are massive!



The cartridge system is something new for WDP, for years they've used a mini-reg that was removable from the marker. It was even sold separately! The new fore grip design (which favors ergonomics) houses the cartridge and also doubles over as a volumizer. The cartridge sits in the bottom half of the fore grip; the remaining section acts as a volumizer for the marker. The air is directly routed to the exhaust valve gallery side of the marker and distributed to the LPR and solenoid/ram via internal gas galleries.



A dramatic increase is the three "primary" gas galleries of the inline regulator area: the cartridge, the vertical regulator adapter area and the receiver body. The biggest improve of the regulator cartridge is the bottom 1/3 of the component. The input gas galleries have been tripled on each side of the regulator. Plus the gas galleries that the regulated air travels through the cartridge are dramatically increased. Another change to the fore grip is the air transfer between the top of the grip and the receiver body. The air passages milled here are a huge improvement to that of all previous models, with an enlarged passageway to the receiver body.

With the increase in design, operating pressure for the marker is between 150-175psi. Expect somewhere closer 200psi until the marker is broken in, though.

Ram and hammer

Angels kick… or at least that's what everyone seems to think that owns a Matrix or a Shocker. Did you know that in the entire marker there is only one 'moving' part that generates all the power behind the ball before it's shot? The hammer (via the ram rod) cycles back and forth, so really any kick from the marker is due to the cycling action of the hammer and the associated pressure from the LPR. This is what inspired the new ram design, entitled the "zero-kick" ram.

The hammer has been reduced to hardly anything, essentially there's just enough material to handle the workload of the marker and not crack under pressure. The hammer however (despite

some original rumors) is still made of stainless steel. It appears as though WDP has completely removed the brass hammer from their design and at this time have stayed away from delrin. The hammer still connects and is secured to the ramrod in the same method. However the face of the hammer has changed to a solid surface versus the recessed face for the valve stem.

Probably one of the biggest redesign to the G7 is the completely new ram system. When the first Speed came out, the ram was redesigned with the removal of the snap ring. Now, about two years later the ram has been redesigned again even further. First off, no more threading the ram into the body. It slides into the right side tube (as viewing from the rear), just like the LPR assembly of valve body. Its secured into place with the same locking rod as the LPR and valve as well.

The reason for the redesign is to accommodate the back plate lever. This lever adjusts the ram stroke per say. With the level in the closed position the breech cannot be opened as the bolt is actually pushed forward to sit flush with the rear of the firing chamber. Only when the lever is in the open position can the breech be opened. So the ram has been redesigned to allow the bolt to be moved forward and back in the breech independent of the actual cycling motion.

WDP has not officially stated why the ram was redesigned to allow the bolt to move forward in the firing chamber, however the most common response from various owners is to combat "roll back."

What is roll back? Roll back is somewhat a myth but a belief held by some that it is a design flaw in the marker, which is the principal agent in chopping paint. Due to the design of the roto-breech there is (approximately) a 4mm space from where the paintball enters the firing chamber and the bolt face rests. This causes the chambered ball to slightly roll back to the bolt face, allowing the next ball in the feed neck to partially enter the path of the bolt. When the marker is cycled the bolt will smash the partially fed ball and usually result in the marker breaking both paintballs. The result is usually pretty messy.

Due to the redesign of the ram, you'll no longer be needed your ram removal tool for your G7. One of the necessary tuning steps in setting up your marker was to adjust the ram stroke by how far the ram body was threaded into the receiver body. Originally threading the ram into the body and then slowly turning the ram far enough forward to where the breechblock would open with the bolt inserted with some resistance. Now that process has been eliminated as the ram is positioned in a specific location held in place by the blocking rod.

One thing to be mindful of with the new ram design is that when the marker is degassed, the bolt will remain in the forward position and must be pushed back with a squeegee to the neutral position. Not a huge problem but one that could be overlooked.

Thirdly we'll decipher the interface system:

Board

The menu for the G7 remains basically unchanged from the Fly; the only noticeable difference is the addition of the hopper speed settings. This is probably the most notable electronic difference on the side of performance. The previous hopper settings were labeled: slow, medium, fast and super fast (sfast). On the G7 these settings have replaced by 16 speed settings, marked 1-16. IR3 owners need not fear, although WDP has implemented a digit system again to their marker the hopper speed settings work different than the COPS sensitivity settings.

The hopper settings, thus far from my experience, appear to be WDP's way of allowing the user to set the BIP delay or (ball in place). To maximize the speed of your marker and decrease the chances for chopping paint, you'd want to set a BIP appropriate to the speed of your loader. A lower speed setting on the G7 would be designed for a loader such as the 9v or 12v Revolution. Whereas a speed setting of 12-16 would be designed for more capable loaders, like the Halo B as the loader is capable of feeding paint into the marker much quicker and more consistent that the Revolution loaders.

The G7's factory default is 8, which has proven to be adequate setting for the Halo B and Evolution II loaders. In preliminary testing, I found that the marker could handle a speed setting of 13 before paint breakage became a problem. The ROF difference between eight and twelve was minimal, so I decided to leave my marker at 10 for the majority of my on-field testing. The speed can be accessed and adjusted through the external buttons on the rear of the trigger frame.

The board still features the same old settings and options (Send, Fetch, ROF, TR, Vibes, LCD light, alarm timers, mode, temperature, dwell, trip and total shot counter).

WDP has partially removed the electronic safety feature on the marker. The G7 no longer boots into the electronic safety option, rather after the marker finishes it's boot sequence it is Live with the eyes enabled, or whatever mode you had the marker set to upon powering it down. Unfortunately, this new feature isn't without some drawbacks. The boot sequence takes about 3 seconds from the time you activate the switch to the time that the marker can fire (as indicated by the red LED on the rear of the trigger frame). So while the marker has an "on and go" capability it's still not instant.

Unfortunately for those A4 Fly owners who were familiar with the 3.7 code, the G7 does not have the ability to disable and re-enable the eyes without cycling between safe & live or by cycling the power. Once the eyes are disabled, you must either make the marker safe or turn it off to regain the ability to use semi-auto (Mode 1) with the eyes enabled.

Breech Action

Despite all the changes to the marker's overall external design, the roto-breech design still remains the central focus of the marker. Allowing for quick and easy action to the bolt and firing chamber, the Angel is still the only marker in paintball to feature this design (or anything like it). Since the design of the Angel, the breech was held into place by two

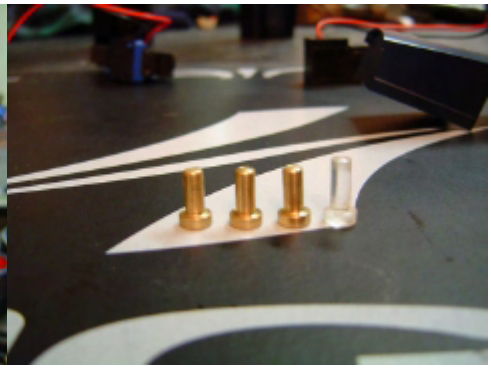
breech rods (one on each bottom-corner of the actual block). To open the breech you'd pull one of the breech rods out via the breech rod knob and the breechblock would swing open on a hinge, created by the other breech rod.

The breech rod that normally was used to open the breechblock has been completely eliminated from the design of the marker. The breech is now opened by the lever on the rear of the marker, which actually moves the hammer forward or back in the chamber below the breech. With the lever in the 'closed' position the breech cannot be opened as the ram pushes the bolt forward to the rear of the firing chamber. With the lever in the "open" position the breech can be opened and the marker power can be cycled (on/off switch).

Keeping in mind again that when the marker is degassed and the lever moved to the open position the bolt will not return to the rest position, you'll need to push the bolt back into the breech with a squeegee.

Menu buttons

The three-button external menu pad is still located on the rear of the trigger frame, only this time the buttons are enclosed with a plastic/rubber composite membrane pad. The menu buttons are marked with 1 dot, 2 dots and 3 dots. The top button is used to switch between safe & live, the middle button is used to navigate the internal menus and the bottom button is used to confirm a selection. The buttons are a short, brass material that sits right below the membrane pad.



**** Update ****

WDP has swapped out the original membrane pad with the "updated" advertised TPR membrane pad. All G7s since early May of 2005 have been shipping with the new pad. In addition, WDP has been using the clear plastic Fly buttons in all of the G7s and have eliminated the brass (shorter) buttons. Although the new membrane pad fixes the problem it still makes it easier to navigate the menu buttons with the longer Fly buttons.

The eyes can be disabled for dry firing by holding the trigger down for 2 seconds, the laser eyes will turn off, the marker vibes will signal the switch and the blinking LED will turn to a solid red LED.

The marker can be switched to Safe at any point in time by pressing and holding the top external function button for two seconds. The LED will switch to a solid green light, indicating that the marker has been put into safe and cannot be fired. The marker can be switched back to Live by pressing the same top button for 1 second.

Next we'll weigh in on the performance components:

Bolt
Although the COPS system has been void of the marker design for over a year, the bolts in both the Fly and '05 Speed still were designed to accommodate the rod that triggered the actual sensor. The R&D team finally designed the bolt without the channel in place, a nice touch to symbolize a change in design.

One of the new designs to the bolt is the recessed slot on each side for the ball detents. This is a first for the WDP bolt, even before they switched to the dual-detent system. Perhaps created to prevent detent stick or to eliminate excessive wear from the detents as the bolt cycles rapidly across the component.

Another new design to the bolt is the overall length of the bolt. Since the LCD was released in mid-1998, the bolt has remained the same width and length. Originally lengthen to allow for a more efficient and stable firing platform, the G7 bolt has been

lengthen to compensate for the new design feature of the ram. The bolt (which now slides forward when the marker is gassed) benefits from this increase in length to eliminate any potential roll back.

Ball Detents

WDP has had four design impressions at how the detent cover conforms to the body of the marker. The first design was on the Fly and the covers were more external to the body shape. The second design was on the Joy Division and Master Tech bodies, the covers were recessed into the body. The '05 Speed body has a similar eye cover design to the Joy Division and Master Tech body mold. The third attempt was with the Euro Angel / Mamba Angel, here the eye covers followed similar suit to the Fly where they did not mold to the body and almost protruded from the body.

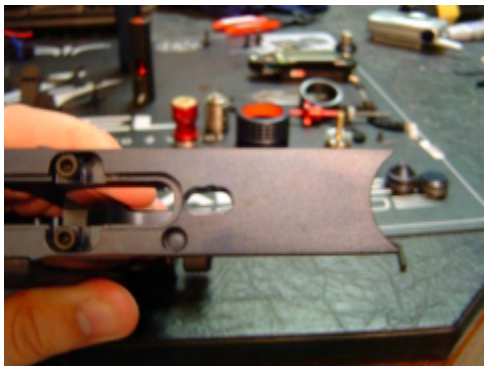
The G7 however as a more unique design, as the eye covers are completely flush with the body. Rather than following the '05 Speed design the eyes are flush with the body rather than recessed. The only flaw I see with the eye covers is the fact that they do not match the color of my body. The marker, which was graphite dust, has black dust eye covers. No exact understanding as to why the eye covers don't match. Thus far only the black dust and black gloss G7 bodies have matching eye covers. The red, blue and graphite markers all have black dust.

Underneath the detent covers it's still the same old marker.

Trigger Frame

The last vital component area of the marker is the trigger frame. Externally, the trigger frame appears to be almost identical to the '05 Speed. However there are a few areas that beneath the surface show why this marker truly is the flagship model. One of the surprising design changes that struck me immediately was the lack of COPS hardware

slot. The void spot (which was filled nicely by the eye strap) is now no longer present in the trigger frame tray.



The trigger system is identical to the '05 Speed, using WDP's EMF trigger system. Originally created for the '05 Speed, this trigger uses a ball-bearing pivot point and a dual magnetic design. The trigger no longer interfaces with the board at all, there is zero physical interaction between the trigger and the board as the opto-switch plate is attached to the actual trigger. The TOE screw is still present and adjusts the angle at which the switch plate will break the beam when the trigger is pulled.

The trigger buffers (on each pivot point) are not installed when the marker is shipped from factory, but they do come in the spares kit that come with each new G7. I actually found that the trigger buffers did not fit when I went to insert the trigger without some effort and once they were in place the free flowing pull of the trigger was much stiffer due to the friction of the buffers. I strongly recommend keeping them removed.

The vernier wheel design is still used, however the vernier wheels have a magnet within the central part of each wheel. This magnet sits centered over the magnet found on the top of the trigger and acts as a return force when the trigger is moving. To some people the trigger pull from the two magnets is a bit stiff; I personally found that replacing the rear vernier wheel with a blank (non-magnetic) wheel from a Fly gave the trigger pull a much lighter & crisper pull. How you adjust your trigger is really up to you.

The G7 marks the return of the LCD display, menu buttons and the ability to use intellifeed. A membrane pad on the rear of the trigger frame now covers the menu buttons.

This is WDP's first attempt at a membrane and thus far it's the only low point of the marker. Unfortunately, due to an issue with the supplier the original (and advertised) membrane was delayed in manufacturing. Originally this caused an initial delay in the release of the G7 to the public. After about 10-days of delay the marker was released with a prototype membrane pad in its place. The membrane pad has proven to be plain and dull and actually difficult to push the menu buttons, its material is quite stiff and combined with the shorter menu buttons it was actually impossible for me to make the marker Safe with gloves on. WDP has finished receiving the original TPR membrane pad and will be offering this as a replacement to the prototype via their Master Tech centers. It'd be best to contact them when they confirm receipt of the component.

WDP has decided to stick with the panel grip cheeks instead of the old-style 'wrap around' grip cheeks found on all previous Angels. There are two thin, independent grip cheeks that secure to the side of the trigger frame into a recessed area. This provides a snug fit to ensure that dirt, paint or moisture enter the trigger frame and possibly damage the board. The grip cheeks have also been designed to allow for the IR transfer between G7s, a design that has been around Angels since the IR3. Unfortunately, WDP has yet to produce software that will allow you to program your marker using your Palm or Pocket PC since the original one for the IR3. No mention of a software program to work with the G7.

Clamping Feed

The clamping feed design on the Angel is still the same, using o-rings instead of a collar that locks down with a screw. However, WDP has switched the o-ring design from 4 individual o-rings to a one-piece rubber clamp that resembles four large o-rings. Previously, the A4 and Speed came with about 16 o-rings; usually some marked with yellow paint spots that meant they were thicker to provide a more secure fit on the Evolution feedneck. Now with the one-piece design the collar secures extremely tight to both the Halo and Evolution feed necks with no sanding required. In fact, I found that initially the Halo feedneck was difficult to slide into the feed neck, a very light coat of oil allowed much easier access without compromising a secure fit.

Lastly we'll rate the aesthetics:

Milling
WDP has tried all sorts of milling schemes on their markers since the original design, the G7 reminded me vaguely of a cross between the '05 Speed and A4 Fly. Most importantly, WDP has carved off as much excess metal as possible from the body.

**** Update ****
WDP has also finally released the much anticipated .45 frame, similar to the '05 Speed.

While good anodizing can cover up most milling flaws or tool marks the milling on the G7 is smooth, consistent and clean. You'll notice that they even shaved off some material from the trigger frame and the bottom of the receiver body where the vernier wheels reside.

In terms of creativity, the G7 does not have an exotic milling scheme, however most 'stock' markers don't by design. WDP has already stated that they will be releasing various aftermarket versions of the G7, such as the popular Force and Cobra models. In addition it is anticipated that they'll also release a Joy Division and Arsenal edition G7.

Anodizing

If there's been one 'flaw' in the Angel over the past few years it's been the quality of anodizing that WDP has provided on their markers. While the anodizing wasn't poor, it lacked durability during extensive and heavy use. The anodizing on the mini-reg seemed to fade after a few months, the corners of the marker body would fade and show the clear aluminum underneath and the finish was far from scratch resistant. In addition, WDP began to favor a "dust" finish more so than a polish finish. Until the G7, the 'stock' model hasn't been offered in a gloss finish since the first batch of IR3s.

Thankfully, WDP has revamped their anodizing process for the G7. When taking apart the marker I noticed that each eye cover, solenoid plate, marker body, trigger frame and breechblock had matching 4-digit serial numbers. Apparently this was done to ensure that all these components were anodized to match and be polished together. The result was a spectacular, clean finish to the marker. Clearly, the quality of anodizing on the marker is thicker than previous Angels. Unfortunately though, the eye covers don't match the receiver body, no know reason why this was done this way.

The G7 is currently offered in black gloss, red gloss, blue gloss, graphite gloss, black dust and graphite dust.

TPR

When the '05 Speed was released, a new material was introduced for the rubber components of the marker. The grip cheek material was changed and a rubber piece was used to cover the rear LED panel. Most likely in response to the way that the Skinz material would shed over time on the grip cheeks this new material appears to be much more durable to friction while still providing grip. The problem thus far, though, the TPR appears to be the weakest link. The material is glued onto the marker and so far the glue

has proven to be fairly resistant but not crazy glue. That's apparent by the breech seal that is known to randomly fall off after extensive use.

The G7 uses a similar membrane as the '05 Speed only this time the membrane covers the majority of the area and has the functional buttons under it.

Manual
Up until recently, WDP had the only high-quality manual in all of manufacturing. DYE and Planet Eclipse have stepped up to produce equally as impressive color manuals. However, WDP's thoroughness and clarity still continues to be their focus when producing the manual/operator's guide. The manual is very thorough in explaining how to adjust settings, set up your marker, disassemble your marker and provide necessary maintenance.

Understanding the manual is the key to getting your marker to perform it's best. Upon reading the manual you'll find that the majority of your questions are contained within the 40+ pages of the full color, glossy paper.

Presentation
While the WDP manual continues to display the TLC put forth in each marker, the box has remained virtually unchanged since the IR3. To this day, the first generation IR3 still has the best box cover and packaging. The marker came secure in a thin box with a foam mold for the marker, stock barrel and accessories. The box did not come shrink wrapped as it was received from Ken Crane at Performance Angel; I imagine he tested the marker prior to shipping it out.

Craftsmanship/Quality
After looking under the hood of the G7, we now have a clear understanding of what has changed. Now, a further look into the evolution of the '05 Speed into the G7 and what exactly has changed between these similarly structured markers.

Performance
So in the end, everyone wants to know: "How does it shoot?" After having shot every generation of Angel and almost every configuration of those Angels possible, I can gladly say that it still shoots like an Angel. However, WDP has designed the most efficient Angel yet by far! Not to mention the marker lacks the 'kick' of previous generations due to these redesigned internals. So does that mean that you'll be able to shoot the G7 blindfolded and think you're shooting a Matrix?

Yes, the marker is motionless in my hands when setup properly. During high ROFs the marker however does display a little movement but nowhere near what previous models have felt like. Not to mention the sound registry of the marker is completely unique for any previous model. One of the onlookers stated: "It sounds like the vacuum noise of the shocker/matrix."

The G7 is capable of running extremely low-pressure ranges, without compromising efficiency and without harming paint. Out of the box, the G7 was set to 80psi (LPR), 11ms dwell and an operating pressure of approximately 190psi. The air system was a 450psi preset 'LP' Crossfire air system.

Efficiency
Efficiency is something that everyone likes to boast about but often times no one really cares about. As the majority of fields operate under an all-day flat fee air pass system, the need to shoot a case off a 4500psi fill is often times not necessary. With the elimination of 10-man, the days of back players carrying 10+ pods onto the field maybe behind us.
The G7 is no different than every other Angel, extremely efficient. Out of the box, with a decent paint-to-barrel match you can expect 1200-1400 shots off a warm 4500psi (68ci bottle). However, my expectations were immediately exceeded even with the stock settings and the dwell set so high. Off a warm 4500psi fill (about 4200psi) I emptied 1700 rounds with about 600psi left in the bottle. At that rate, it's very possible with tweaked settings to shoot over a case of paint off a 68ci bottle.

I anticipate that for front players who prefer a small bottle (45ci) you should be able to shoot about 1200rds, give or take. The need for a 88ci or 92ci seems completely unnecessary unless you're unable to get 4500psi, play scenario games, or have found a way to carry 20+ pods onto the field and move.

Speed
As technology has continued to advance, so too has loader technology. The G7 board is capped at 31bps, which means that the electronics of the marker limit the maximum rate of fire to 31bps. The rate of fire with the eyes disabled can be user set up to 25bps, however it is recommended that this number does not exceed the capable feed rate of the loader.

The biggest factor in speed is often times related to more than just the feed rate of your loader but also your marker's ability to handle recharge. If the marker cannot refresh the valve chamber with enough pressure before the next shot is fired you run the risk of not only losing out on the maximum ROF of the marker but the maximum velocity. While a properly setup Angel won't give you problems, WDP has continued to refine the internals of the Angel to not only operate under extremely high rates of fire but remain efficient.

Reliability
Hands down, no questions asked, this is a title that no one can take away from WDP. The proven reliability and track record of WDP markers is unparalleled in paintball. The G7 is no different, in terms of quality control from the factory and long-term dependability in the field. The Angel's design has focused heavily on minimizing day-to-day maintenance and use little to no lubrication in the process.

Angel owners over the years will be the first to tell you that not only is the Angel extremely easy to maintain but the manual spells out exactly what should be and how

often. You'll find that for the first thirty-to-forty thousand cycles you'll only ever need to use more than a few drops of oil.

As a true testament to WDP, my LCD has worked flawlessly since 1998 with all but one original component. With over 800,000 cycles of use on the shot counter only the valve stem has been replaced (at about every 80,000 cycles). The fact that WDP has now redesigned how the valve stem is manufactured I'd imagine that even this change maybe eliminated.

Conclusion:

Dislikes/flaws/short comings

As great as the G7 is, it's still not perfect. Although I was originally a fan of the clamping feed neck on the Angel, after having tried a CCM rise on my '05 Speed I much prefer the locking collar design. While the new one-piece o-ring seal does secure a much tighter fit on the feedneck, I'm surprised that WDP has not gone in with the rest of the common designs yet.

Next is the TPR material that WDP has been using on various other contact points of the marker. While I've been a big fan of the redesigned grip cheeks, I dislike the TPR material on the front of the fore grip and now the rear of the trigger frame. While the membrane pad idea was unique the problem in manufacturing put a sour spot on the matter. Although, WDP is in the process of making the actual piece available, it's still unfortunate.

Plus the glue used on the '05 Speed (which is probably the same for the G7 TPR components) proved unable to withstand the stress of use as it fell off after a few days of play. While the TPR pieces are a nice addition and do aide in grip on the marker they do run the risk of falling off and then becoming eyesores, especially the TPR on the front of the fore grip.

Time will tell on how long the components hold up for, hopefully as long as the marker continues to work which at the rate that Angels age, it's going to be a long time.

Overall

So after having read everything above, you've now learned exactly what is different about the G7. Is this marker worth the $1,500 price tag? Or better, is this marker worth the $500 extra dollars over the '05 Speed? It's a difficult question, one that DM4 owners probably ask when they look at the DM5 or Intimidator owners ask when they look at the newer generations.

The G7 is a refined '05 Speed with some more bells and whistles and LCD display and a rechargeable battery. Is it a better marker? Yes. Is it a more efficient marker? Yes. Is it a faster marker? No. Is it more accurate? No. Does it have less kick? Yes. It's certainly an investment decision and thus far the majority of G7 owners I've seen online are not first-time Angel owners.

As WDP continues to innovate, they'll continue to improve on areas that warrant redesign. Even the G7 will be improved upon in future generations. As an Angel owner of 7 years now, I've seen the Angel evolve from almost the beginning and I've been more than impressed. Impressed enough to have only shot Angels in those past 7-years!
The price tag on the G7 is competitive with other high-end tournament level markers; right now the only thing stopping you from obtaining one is the incredibly high demand on them from distributors.

While I would never discard my '05 Speed, it has been placed in my gear bag in favor of the G7. Considering how infrequently (5 times in 7 years) my marker has gone down on me in a game I can't imagine the Speed seeing much action. My advice? See if you can find someone at your area field or local store with a G7 and try it out. If you're a fan of WDP's superior craftsmanship and engineering you'll be a fan of this marker.

In the 3-weeks I've owned my marker it's proven to meet all of my expectations and the redesigned internals have far exceeded them. The new breech action and ram design are different and easy to see just why they were added. If you're looking to add WDP's latest and greatest to your gear bag or collection then the G7 should definitely be on your list. However, if your current marker seems to be working great for you, then maybe holding out for a customer G7 is something that would make more sense. In either case, WDP continues to prove in the form of their newest product that they are still the manufacturer to beat.

About the Author:
Jason Fearing is an active member in all the various WDP/Angel forums attended the April 2004 tech class for the Fly, Speed and A4. He's been an exclusive Angel owner since November of 1999 and has owned every generation of Angel, except the V6. Currently he owns a first generation LCD, A4 Fly, '05 Speed and a G7.

He is the co-founder of Angel-Owners.com and has written numerous Angel related articles, reviews and FAQs. He can be reached at jason_fearing@msn.com.