



Hit Locations

After attending the Front Sight four day defensive handgun course it has come to my attention that the HERO System hit location tables are grossly in error. These are the ASMRB substitute hit location tables and a bit of associated computations on hit probabilities.

Hit Location Table

| 3D6 | Location | Stun | Body | Norm | Armor | CV | Rmult | Area | Hit% |
|-------------------------|----------------|-------|-------|-------|--------|--------------------------|-------|------|------|
| 3 | Head, eyes | x5 | x3 | x2 | 0 (v1) | -8 | x4 | 0.01 | .005 |
| 4 | Head, face | x5 | x3/2 | x2 | 2 (v1) | -7 | x3.5 | 0.06 | .014 |
| 5 | Head, general | x5 | x2 | x2 | 4 (v1) | -6 | x3 | 0.15 | .028 |
| 6 | Hands | x1 | x1/2 | x1/2 | none | -8 | x4 | 0.1 | .046 |
| 7-8 | Arms | x2 | x1/2 | x1/2 | none | -5 | x2.5 | 0.5 | .167 |
| 9 | Shoulders | x3 | x1 | x1 | none | -5 | x2.5 | 0.25 | .116 |
| 10 | Chest, general | x3 | x1 | x1 | 3 (v1) | -3 | x1.5 | 0.25 | .125 |
| 11 | Chest, core | x4 | x3/2 | x3/2 | 3 (v1) | -4 | x2 | 0.15 | .125 |
| 12 | Stomach | x3 | x1 | x1 | none | -5 | x2.5 | 0.25 | .116 |
| 13 | Vitals | x4 | x1 | x1 | none | -6 | x3 | 0.15 | .097 |
| 14 | Thighs | x2 | x1 | x1 | none | -4 | x2 | 0.8 | .069 |
| 15-16 | Legs | x2 | x1/2 | x1/2 | none | -6 | x3 | 0.6 | .074 |
| 17-18 | Feet | x1 | x1/2 | x1/2 | none | -8 | x4 | 0.2 | .019 |
| totals by location, new | | 2.812 | 1.031 | 1.0 | 0.75 | sum over 16 locations | | | |
| totals by location, old | | 2.812 | 1.0 | 1.0 | none | sum over 16 locations | | | |
| totals by odds, new | | 2.875 | 0.954 | 0.956 | 0.889 | sum over 216 dice states | | | |
| totals by odds, old | | 2.866 | 0.942 | 0.942 | none | sum over 216 dice states | | | |

Modified Locations

These are the resulting effectiveness for the new and old location tables. The values given are averages over the statistical and location counts for the new and old locations respectively.

| Locations | Stun | Body | Norm | Armor | OCV | Rmod | Notes |
|-------------------------|-------|-----------|--------------|-------|-----|------|-------------------------------------|
| 1D6+3 Head Shot | | -4 | x2 | | | | Locations 4 through 9 |
| totals, new | 3.0 | 1.0 | 1.083 | 1 | " | " | sum over 6 locations or dice states |
| totals, old | 3.0 | 1.083 | 1.083 | none | " | " | sum over 6 locations or dice states |
| 2D6+1 High Shot | | -2 | x1.5 | | | | Locations 3 through 13 |
| totals by location, new | 3.7 | 1.35 | 1.3 | 1.2 | " | " | sum over 10 locations |
| totals by location, old | 3.7 | 1.3 | 1.3 | none | " | " | sum over 10 locations |
| totals by odds, new | 2.917 | 1.0 | 1.0 | 1.028 | " | " | sum over 36 dice states |
| totals by odds, old | 2.889 | 0.972 | 0.972 | none | " | " | sum over 36 dice states |
| 1D6+7 Core Shot | | -2 | x1.5 | | | | Locations 8 through 13 |
| totals, new | 3.167 | 1 | 1 | 1 | " | " | sum over 6 locations or dice states |
| totals, old | 3.167 | 1 | 1 | none | " | " | sum over 6 locations or dice states |
| 2D6+4 Body Shot | | -1 | x1.25 | | | | Locations 6 through 16 |
| totals by location, new | 2.8 | 0.9 | 0.9 | 0.6 | " | " | sum over 10 locations |
| totals by location, old | 2.8 | 0.9 | 0.9 | none | " | " | sum over 10 locations |
| totals by odds, new | 2.917 | 0.958 | 0.958 | 0.917 | " | " | sum over 36 dice states |
| totals by odds, old | 2.889 | 0.931 | 0.931 | none | " | " | sum over 36 dice states |
| 2D6+7 Low Shot | | -2 | x1.5 | | | | Locations 9 through 18 |
| totals by location, new | 2.6 | 0.9 | 0.9 | 0.6 | " | " | sum over 10 locations |
| totals by location, old | 2.6 | 0.9 | 0.9 | none | " | " | sum over 10 locations |
| totals by odds, new | 2.472 | 0.833 | 0.833 | 0.417 | " | " | sum over 36 dice states |
| totals by odds, old | 2.5 | 0.861 | 0.861 | none | " | " | sum over 36 dice states |
| 1D6+12 Leg Shot | | -4 | x2 | | | | Locations 13 through 18 |
| totals, new | 2.0 | 0.667 | 0.667 | 0 | " | " | sum over 6 locations or dice states |
| totals, old | 2.0 | 0.75 | 0.75 | none | " | " | sum over 6 locations or dice states |

Optional: Sub Locations

A note about sub portions of hit locations. In general, the effective Body Multiplier will be an additional x1/2 to the location for purposes of determining Impairment and Disabling. Sub locations may have other effects as well. For example, groin hits (#13, Vitals) would be calculated as Body x1/2 and Stun x4 but with no PD rather than the usual Body x1 and Stun x4. Other sub locations would have other side effects.

Dice Rolling Statistics

Here are some dice rolling statistics for your convenience.

| | | | | | | |
|------------|------|------|----|------|------|---|
| 1D6 | 1 | 2 | 3 | 4 | 5 | 6 |
| states | 1 | 1 | 1 | 1 | 1 | 1 |
| N- | 1 | 2 | 3 | 4 | 5 | 6 |
| frac. | .167 | .333 | .5 | .667 | .833 | 1 |

| | | | | | | | | | | | |
|------------|------|------|------|------|------|------|------|------|------|------|----|
| 2D6 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| states | 1 | 2 | 3 | 4 | 5 | 6 | 5 | 4 | 3 | 2 | 1 |
| N- | 1 | 3 | 6 | 10 | 15 | 21 | 26 | 30 | 33 | 35 | 36 |
| frac. | .028 | .083 | .167 | .278 | .417 | .583 | .722 | .833 | .917 | .972 | 1 |

| | | | | | | | | | | | | | | | | |
|------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|
| 3D6 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| states | 1 | 3 | 6 | 10 | 15 | 21 | 25 | 27 | 27 | 25 | 21 | 15 | 10 | 6 | 3 | 1 |
| N- | 1 | 4 | 10 | 20 | 35 | 56 | 81 | 108 | 135 | 160 | 181 | 196 | 206 | 212 | 215 | 216 |
| frac. | .005 | .019 | .046 | .093 | .162 | .259 | .375 | .500 | .625 | .741 | .838 | .907 | .954 | .981 | .995 | 1 |

Autofire Statistics

Here are some statistics on the average number of hits one can expect with a given burst size (or RoF) and a given "to hit" number. Note that at the higher rates of fire even low "to hit" numbers can have high average hit counts.

| To Hit #: | 3- | 4- | 5- | 6- | 7- | 8- | 9- | 10- | 11- | 12- | 13- | 14- | 15- | 16- | 17- | 18- | 19- | 20- | 21- | 22- |
|----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1 Per 4 | 0.005 | 0.019 | 0.046 | 0.093 | 0.167 | 0.278 | 0.421 | 0.593 | 0.792 | 1.019 | 1.259 | 1.500 | 1.745 | 2.000 | 2.255 | 2.500 | 2.745 | 3.000 | 3.255 | 3.500 |
| 1 Per 2 | 0.005 | 0.019 | 0.051 | 0.111 | 0.213 | 0.370 | 0.588 | 0.870 | 1.213 | 1.611 | 2.051 | 2.519 | 3.005 | 3.500 | 4.000 | 4.500 | 5.000 | 5.500 | 6.000 | 6.500 |
| 1 Per 1 | 0.005 | 0.023 | 0.069 | 0.162 | 0.324 | 0.583 | 0.958 | 1.458 | 2.083 | 2.824 | 3.662 | 4.569 | 5.523 | 6.505 | 7.500 | 8.500 | 9.500 | 10.50 | 11.50 | 12.50 |
| 2 Per 1 | 0.009 | 0.046 | 0.139 | 0.324 | 0.648 | 1.167 | 1.917 | 2.917 | 4.167 | 5.648 | 7.324 | 9.139 | 11.05 | 13.01 | 15.00 | 17.00 | 19.00 | 21.00 | 23.00 | 25.00 |

Notes & Observations

Aside from the hit location modifications above I have a few observations about OCV, DCV, and Setting in room-to-room combat.

OCV

If you do not have sufficient strength to use the weapon then all shots after the initial in a given phase should be resolved at OCV = 0. Yep, that's right, zero. The gun is out of control and is only pointed in the direction of the target. Hits are randomly located and can not be directed at individual target locations. It *may* be possible to use the limited area locations (high, body, etc.) but I'm not even sure of this.

DCV

I now do *not* think the high DCV values we've sometimes encountered in room-to-room combat are at all unreasonable. You just would not believe how difficult it can be to hit a stationary target at about twice arm's length after popping around a corner. ...Really embarrassing in fact. The question of the target, as Mike put it, "vibrating in place" is not such a mystery given how hard it can be to hit a stationary target when you are in a real hurry to not get shot first. If you want to hit the dodging guy you should use suppression fire at the area he's in - do not try to hit him as an individual. I'll know more after I take the submachine gun class.

Set

Setting should increase OCV more than it does now. It should give a location OCV bonus equal to its OCV contribution. Target locations were very much easier to hit when I set on them and took some time. My hit probability was about 50% to hit a stationary 1 inch square at 10 meters when set and braced. On the other hand I could only hit a torso sized "moving" target from the same range when forced to draw and shoot in less than three seconds.

Range Multipliers

Perhaps the solution to most of the OCV issues would be to assign Range Multipliers in addition to part of the OCV modifiers to hit locations. Suppose we assign a range multiplier of x2 (cumulative) for every -4 OCV of the original location modifier and then cut the OCV location modifier in half -- as if the target were stationary. If the target is in fact stationary (DCV 0) then its locations would have modifiers of 0 (none) but the range multipliers would still be counted. This would work *much* better for missile weapons than the current system which is better for hand-to-hand weapons. Consult the new location table to see what these range multipliers would look like.

- Assign a range multiplier of x2 for every -4 OCV of the unmodified location modifier.
- Use only half (round down) of the original, full OCV location modifier if the target has a DCV.
- Use a location modifier of 0 (none) for any location if the target has no DCV (is stationary). The range multipliers would still be at full value.

| Location OCV mod | 0 | -1 | -2 | -3 | -4 | -5 | -6 | -7 | -8 | -9 | -10 |
|------------------|---|------|-----|-----|----|-----|----|-----|----|----|-----|
| Range Multiplier | 1 | 1.25 | 1.5 | 1.5 | 2 | 2.5 | 3 | 3.5 | 4 | 5 | 6 |

Ego Roll for Combat: "Combat Cool"

All persons entering into close combat are required to make a modified Ego roll before engagement in order to use their full OCV effectively. This is called a "Combat Cool" roll and is an indication of how a combatant retains their composure against being momentarily intimidated by an immediate threat. Without a successful roll the combatant is in "panic fire" mode -- is acting on their fight or flight instinct -- and is too rushed to attack accurately. The roll can be attempted once per phase that the attacker is engaged until it is successfully made. Once the roll is made they may use their Dex/Skill OCV levels as usual for the rest of the engagement.

The *highest value* of any levels in any skills or expertise that would tend to build immediate confidence in attacker effectiveness may be applied to the Ego roll:

- Combat levels gained from fight experience in the kind of weapons at hand may be used as a modifier to the roll. (Note: levels in hand to hand, etc., do not count if you are using a gun, etc.)
- Levels in Tactics, or other trained techniques for dealing with combat situations, may be used as a modifier to the roll.
- Levels in resistance to Presence attacks may be used as a modifier to the roll. (Note: levels in Ego Defense generally *do not* count.)

Against the attacker's Ego roll is the defender's effective Presence modifiers. A hallway full of SWAT team is a bit more intimidating than a convenience store owner with a .38 revolver. Modifiers from defender presence are the ref's discretion.

The roll affects missile and melee combat differently. Melee combatants will only lose their skill levels but not their OCV from Dex while missile combatants will lose both.

- Missile Combat: Persons using missile weapons will not be able to use any of their OCV from either Dex or skill levels if they fail their roll for "Combat Cool."
- Melee Combat: Persons in melee combat will not be able to use OCV from skill levels but would retain their Dex based OCV if they fail their roll for "Combat Cool." Additionally, melee combatants failing their roll are not allowed to use any trained combat maneuvers.

In any case, a successful Presence Attack by the opposition will undo the effects of an established successful "Combat Cool" roll and put the combatant back into "panic fire" mode.