

### **10MM NOTES**

#### History:

1. Miami Shooting Incident - 4/11/86
  - A. Ammunition failure - Dove made perfect shot, gun worked perfectly, bullet failed to do what is necessary
  - B. Had bullet met currently established FBI standards, Platt's heart would have been penetrated and he could have lasted only 30 seconds or so - not the four minutes plus after which he killed Grogan and Dove
2. 1987 Weapons Procurement - 8/87
  - A. Examined all currently available 9mm & .45 weapons
  - B. Established no single weapon possessed all the features and capabilities desired for FBI issue pistol
    - 1) All such features & capabilities existed BUT
    - 2) Not all present in one weapon
  - C. Began drafting specifications for FBI pistol
3. Wound Ballistics Workshop - 9/87
  - A. Brought in disparate and opposing theories and views regarding wound ballistics
  - B. Limited consensus obtained:
    - 1) Only two ways to incapacitate human target
      - a) Hit central nervous system (fast incapacitation)
      - b) Loss of blood sufficient to black out brain or drop blood pressure (relatively slow)
    - 2) Penetration of vital organs is critical
    - 3) Given desired penetration, only way to increase effectiveness is to make hole bigger

4. FBI Wound Ballistic Research - 1987-1988
  - A. Adopted documented research of Dr. Martin Fackler, Director, Wound Ballistics Laboratory, U.S. Army Letterman Institute, Presidio of San Francisco, California
  - B. Established bullet performance standards for law enforcement use
    - 1) Minimum 12 inches penetration, & 18 inches is better
    - 2) Bullet should create larger than caliber sized hole (NOTE: See [Handgun Wounding Factors & Effectiveness](#))
5. FBI Ammunition Test Protocol - began 12/88 & ongoing
  - A. Designed to measure bullet effectiveness when used in conditions commonly present in FBI shootings
  - B. Eight penetration tests - five shots per test - 40 shots total
    - 1) Bare 10% gelatin at 10 feet
      - Proven to duplicate wounds in muscle tissue
      - Correlates results with other researchers, all of whom shoot bare gelatin
    - 2) Heavily clothed gelatin at 10 feet
      - Four layers of clothing on gelatin
        - Cotton tee-shirt material
        - Cotton flannel shirt material
        - 10oz down in nylon carrier
        - Heavy denim outer layer
    - 3) Steel at 10 feet
      - 20-gauge steel - heaviest found in car doors
      - Clothed gelatin set 18" behind steel
        - Cotton tee-shirt material
        - Cotton flannel shirt material

- 4) Wallboard at 10 feet
  - Simulates interior wall construction
  - Clothed gelatin set 18" behind wallboard
    - Cotton tee-shirt material
    - Cotton flannel shirt material
- 5) Plywood at 10 feet
  - Simulates construction lumber/wood doors
  - Clothed gelatin set 18" behind plywood
    - Cotton tee-shirt material
    - Cotton flannel shirt material
- 6) Auto windshield glass at 10 feet
  - Glass angled at 45 degrees
    - Shot angled 15 degrees to glass
      - Simulates shooting at driver from left front quarter
  - Clothed gelatin set 18" behind glass
    - Cotton tee-shirt material
    - Cotton flannel shirt material
- 7) Clothed gelatin at 20 yards
  - Two layers of clothing on gelatin
    - Cotton tee-shirt material
    - Cotton flannel shirt material

*(Note: starting in 1990, this test was changed. It now duplicates Test 2 - Heavily Clothed Gelatin [4 layers] but at 20 yards.)*
- 8) Auto windshield glass at 20 yards
  - Glass angled at 45 degrees
    - Simulates shooting at driver from straight ahead
  - Clothed gelatin set 18" behind glass
    - Cotton tee-shirt material
    - Cotton flannel shirt material

C. Other tests performed

- 1) Accuracy
  - 10 round groups at 25 yards
  - Using test barrel & service weapon
- 2) Velocity
  - From test barrel & from service weapon

- 3) Pressure
- 4) Functioning
- 6. FBI Actions Resulting
  - A. Developed 10mm load 12/88
    - 1) Commercial offerings too high pressure, too high velocity
    - 2) Originally seen as potential solution to controversy between big bullet advocates (.45) and high capacity advocates (9mm)
  - B. Tested 4 calibers to determine most effective for adoption by FBI
    - 1) .38 - 158gr LHP+P FBI load (establish minimum standard)
    - 2) 9mm - 147gr subsonic load (best 9mm then available)
    - 3) .45 - 185gr JHP (best .45 load then available)
    - 4) 10mm - 180gr JHP subsonic developed by FBI
  - C. Director approved adoption of 10mm (2/89)
  - D. Initiated procurement of 9500 10mm pistols (5/89)
    - Two manufacturers submitted out of 21 expressing interest
      - Colt (one sample)
      - Smith & Wesson (three samples)
  - E. Awarded contract for weapons to Smith & Wesson (1/90)
    - First 50 delivered 2/89 for test and pre-production evaluation
    - 200 for field-testing and evaluation received 5/90
    - Began issue to New Agents 7/90
    - Began issue to field Firearms Instructors 8/90
    - Begin general Field distribution and issue in 12/90

## 7. Facts About S&W M1076

### A. Size Comparison with S&W M13

- Empty Weight: M1076 - 36 oz. M13 - 32 oz.
- Loaded Weight: M1076 - 44 oz. M13 - 35 oz.
- Length: M1076 - 1/4 inch shorter than M13
- Width: M1076 - 3/8 inch thinner than M13
- Height: M1076 approximately same height as M13

### B. Feature List of M1076

- Tritium sights standard, plain sights optional
- Three magazine capacities: 9, 11 & 15 rounds
- Three different grip shapes available
- Issued with two 9-round, four 11-round & one 15 round magazines
- Issued with holster, 1 double & 1 single mag pouch

## Reasons for Adoption of 10mm

### 1. Initial Test Results (12/88-1/89) on which decision based:

#### A. .38 Special +P – 158-gr lead hollow point

- Success rate meeting 12" minimum: 67.5%
- Wound volume (cubic inches of tissue disrupted): 2.16
- Average penetration: 11.76
- Test barrel average group: 2.992
- Service weapon average group: 10.863

#### B. 9mm Subsonic – 147-gr jacketed hollow point

- Success rate meeting 12" minimum: 67.5%
- Wound volume (cubic inches of tissue disrupted): 2.82
- Average penetration: 13.84
- Test barrel average group: 2.305
- Service weapon average group: 2.774

#### C. .45 ACP – 185-gr jacketed hollow point

- Success rate meeting 12" minimum: 92.5%
- Wound volume (cubic inches of tissue disrupted): 3.98
- Average penetration: 19.95
- Test barrel average group: 2.040
- Service weapon average group: 4.319

- D. 10mm FBI Load – 180-gr jacketed hollow point
- Success rate meeting 12” minimum: 97.5%
  - Wound volume (cubic inches of tissue disrupted): 4.11
  - Average penetration: 17.90
  - Test barrel average group: 0.893
  - Service weapon average group: 2.550

2. Common Questions:

- Since the .45 tested so well, why not adopt it instead of a new gun/caliber?
  - First, the 10mm tested better, albeit marginally better, than the .45 and we were committed to adopt the best round. Nevertheless, the 10mm has far superior accuracy, allows for slightly higher capacity than similar sized .45 weapons, is a new cartridge with room for further improvement whereas the .45 has been around for 80 years and is as good as it is ever going to be, and the recoil of the 10mm is softer than that of a comparably sized .45
  - Second, related answer is that even had the FBI adopted the .45, a new weapon would have still been required. In 1987 we determined that there was no current weapon with all the features in one package that we desired. Regardless of caliber, the FBI would still have specified and procured a new weapon.
  - Third, the difference between the two is marginal and had the Director said “go with the .45”, we would have done so gladly. However, based on the results of the testing, we would not recommend the 9mm for adoption as the FBI issued round.
- Since you developed the 10mm, why not do the same thing with the 9mm?
  - The 9mm has been in existence since 1902. It is actually an older cartridge than the .45. In that time, so many variations and designs have been tried that it is hard to imagine anything new that could be attempted. For example, Federal Cartridge Corp. has 19 different 9mm loadings available. The currently produced 147-grain loadings are the upper practical limit for the caliber in terms of weight. Heavier bullets have not proven feasible, and everything else that you can think of has been tried.

- Aren't you afraid of over-penetration?
  - The fear of over-penetration is a misconception, which was created back when law enforcement was trying to overcome misinformed public resistance to the use of hollow point ammunition. In the process, we began to believe it ourselves. First, our lawyers are unaware of any successful legal action resulting from the injury of a bystander due to a round over-penetrating the subject. We are aware of numerous instances of Agents/officers being killed because their round did not penetrate enough (Grogan and Dove, for example). Further, if you examine shooting statistics you will see that officers hit the subject somewhere around 20-30% of the time. Thus 70-80% of the shots fired never hit their intended target, and nobody ever worries about them - only the ones that might "over penetrate" the bad guy. Third, as our testing shows, even the most frangible bullets designed specifically for shallow penetration will plug up when striking wood or wallboard and then penetrate like full metal jacketed ammunition. We are aware of successful legal actions where an innocent party has been struck by a shot passing through a wall, but as we have proven, ALL of them will do that.
  - Another overlooked factor is that frequently the bullet must penetrate some obstacle before reaching the desired target area, such as glass, clothing, arms, etc. If all of our shots were at the subject's unobstructed, frontal chest area then the required penetration could be less, but such ideal conditions are seldom present.
- How much does the gun cost?
  - The weapon with standard night sights, three grip options and seven magazines (2 nine round, 4 11 round and 1 fifteen round) costs the FBI \$295 a copy. We doubt you will be able to get them for that, as I believe S&W is looking upon us as a "loss leader". We anticipate their contract price for departmental orders will be in the \$400+ range.
- What about women and small-handed shooters?
  - We do not anticipate any major problems. Our experience is that they have difficulty with revolvers for two reasons: the requirement for a long, heavy double action trigger pull for every shot fired, and the extremely inefficient shape of revolver grips for the transmission of recoil into the hand. The recoil is focused on the bone structure of the small hand, and before long bruises the hand and thumb bones. Every

shot fired is then painful to the shooter. The pistol (any pistol) softens the recoil by virtue of the energy absorbing action of the slide, and transmits it into the hand more efficiently and in a manner not damaging to the hand. We have found that they shoot better, shoot more often, and enjoy it for the first time - all of which translates into a better shooter - because there is no pain or discomfort in the hand. Further, only the first shot is double action, and that is shorter and smoother than on our revolvers. Most of their shooting is done in the short, single action mode, which follows the first shot. The average double action trigger weight of our 10mm pistol is 11.5 pounds, and the average single action trigger is 6 pounds.

- Secondly, the weapons have three different grip shapes available so we will be better able to fit the weapon to the individual Agent's hand.
- Isn't the gun going to be large and heavy?
  - The weapon is actually smaller in overall dimensions than our currently issued Smith & Wesson M13 revolver with a 3-inch barrel. Our 10mm pistol is approximately one-quarter inch shorter in over all length, about the same over all height, and three-eighths of an inch thinner than the M13. So it carries far more comfortably and unobtrusively, especially if a good weight-bearing holster is used. A fully loaded M13 weighs 35 ounces. The Model 1076 fully loaded weighs just over 43 ounces, only 5 ounces more than a fully loaded SIG-Sauer P226. Empty, it is only about 3.5 ounces heavier than the empty M13.
- How long will the transition take?
  - About 2-years. The bottleneck is our gun vault. They estimate they can process 100 guns a week, so our distribution is based on that rate. 9500 Agents equals 95 weeks, and that is not counting weapons processed for issuance to New Agent Classes.
- Will your contract eat up S&W's production to the extent that nobody else can get them for a while?
  - S&W's production capability is far in excess of our 100 gun a week delivery requirement. For example, Virginia State Police contracted with S&W for about 2200 of the weapons, identical to ours but with a five inch barrel instead of our 4.25" inch barrel and they received their entire order by July, 1990. Their transition is complete, and all of their



troopers are now armed with the 5" version of our gun, called the Model 1026.

- ❑ Is anyone else making 10mm pistols?
  - Yes. For example, Colt has their Double Eagle double action pistol available in 10mm and their single action Delta model. Ruger is developing one that should appear sometime this year. SIG-Sauer is developing one, and I believe it will appear in one to two years. Glock has chambered their weapon in 10mm.
- ❑ Do you anticipate shoulder weapons in 10mm?
  - Yes. Colt, Ruger and H&K are all working on developing a 10mm shoulder weapon and or submachine gun.
- ❑ Can police departments get ammunition tested that they are interested in?
  - Yes. We will be happy to test ammunition for police. We will require 300 rounds for the test, and need to know what firearm they want it tested in. Contact our Ballistic Technician Ted Hollabaugh at 703-640-3280 to arrange the testing, or determine if the round may have already been tested.
- ❑ Why didn't the 9mm do better - that is surprising?
  - The 9mm is no more effective than the .38 Special, which should not be surprising since they are the same caliber bullets (.35 caliber) at the same range of velocities and bullet weights.
- ❑ Are you saying the 9mm is no good?
  - No. We are saying it is as good as the .38 Special, which has served us for a long time. It has severe limitations, which we are not willing to accept. It is woefully inadequate for shooting at people in cars, for example, and over half of our shootings involve vehicles. It is a marginally adequate wounding agent. We have had a number of 9mm shootings over the past couple of years, and if you define a good shooting as one in which the subject stops whatever he was doing when he gets shot, we have yet to have a good one, and we are hitting our adversaries multiple times. We have shot half a dozen dogs in the past year and have not killed one yet, although we have run up a significant veterinary bill. The 9mm with proper ammunition is not a bad round.

It is just nowhere near as effective as the 10mm and .45 offerings, and the disparity between it and the larger calibers has remained a constant throughout all the testing we have done over the past two years.

- What is different about your pistol other than the caliber?
  - Nothing revolutionary. It is a composite of the features we identified as desirable, all of which existed in varying degrees among available weapons. It is an all steel, conventional double action pistol with no manual safety, and no magazine disconnect. It has a 40,000 round warranty on the slide and the frame, which is important to us because we expect a weapon to be able to last an Agent's career. Although we will replace the weapon if something better comes along, we do not want to be in the position of having to replace it simply because it is worn out in a few years. In a 20-year career, an Agent will fire at least 40,000 rounds.
- Will your gun handle the hot stuff on the market?
  - Yes. Several hundred rounds of higher velocity ammunition have been fired through the pistols by the FTU without visible problems. Smith & Wesson initiated a program to fire a M1076 to destruction with the hottest commercial ammunition on the market (Norma), but discontinued the test after approximately 18,000 rounds. Nothing had broken, and they had more pressing matters to spend their time on. However, although illuminating, this is insufficient data at this time to project the longevity of one of these pistols, which is fed a steady diet of the "hot" loads.
- How much time will be necessary to train Agents with the new weapon?
  - Recruits are no problem. They start clean on day one learning the skills they need, and by the time they graduate (112 hours and over 5500 rounds later) they are better, more proficient shooters than we produced with revolvers. The problem is the field Agent who has spent years learning and ingraining revolver skills and habits. With them, we must break the old habits and instill new, different skills, which apply to shooting pistols, such as a different grip, different trigger control technique, and different operating features. We will require a five-day transition training for each Agent and budget 2000 rounds per Agent for that purpose. The few who still are not sufficiently proficient

to be issued the weapon will receive regular remedial training until such time as they are.

- ❑ Will you continue to allow revolvers?
  - Only temporarily. Once the transition is completed, the FBI will be a pure pistol agency. There will be no revolvers. We have a personally owned pistol program now whereby an Agent can purchase a pistol (either 9mm or .45) and be authorized to carry it. The personally owned pistol program will continue unchanged, so the Agent can choose to carry the issued 10mm, or a personally owned 9mm or .45. Currently, we authorize all the Smith & Wesson and Sauer-Sauer pistols for personally owned use, and the new weapons in those calibers plus 10mm and .40 S&W will be added to the list as they become available.
- ❑ What is the best round in?
  - 9mm - the Federal 147 grain HydraShok
  - .45 - the Federal 230 grain HydraShok
  - 10mm - the FBI load, a 180 grain Sierra bullet at 980 feet per second
  - .380 - there isn't one. The full metal jacketed round is the best of a bad choice, but only because it might penetrate.
  - .357 - we haven't found one that is sufficiently better than the best .38 load to justify all the sound and fury of shooting it, unless you need the increased effective range, which the higher velocity gives you. We have only tested five so far, and none of them stands out.
  - .38 Special - the Federal 147 grain HydraShok

NOTE: there are a lot of rounds we have not tested, so all of the above recommendations are strictly limited to those we have tested. The testing is continuing, and in time we will have an even better basis for comparison.

- ❑ Can we get copies of the test results?
  - Yes. Send a letter to the Firearms Training Unit (attn: Ted Hollabaugh) at Quantico and he will send a copy to you. Or call him at (703) 640-1386.
- ❑ Isn't shot placement the most important requirement in a shooting incident, and doesn't that make the issue of caliber less important?

- Shot placement is obviously critical, and our test criteria presume that the shot is placed in the vital area of the body, which contains the brain, upper spinal cord, heart and aorta/vena cava. This area runs from just above the eyes to the diaphragm, and is about 4 inches wide. But, as our experience in Miami amply illustrates, shot placement is only the first part of the equation. Jerry Dove placed his shot perfectly. Bullet performance is critical to translate shot placement into an effective, incapacitating wound. If shot placement was all that mattered, we could arm all Agents with .22's. Secondly, perfect shot placement may be difficult to attain in the stress and dynamics of a shooting incident. The larger calibers offer a "margin of error" in that where a smaller bullet may just miss the aorta, for example, the larger one in the same placement will damage it. A good example is killing a 400 pound pig with a .22, something commonly done on the farm. If the shot placement is exactly right, the pig is instantly killed. If it is off less than an inch, the pig goes wild and the process of killing it becomes rather lengthy and involved, whereas a larger caliber would succeed with a larger margin of miss than an inch. (Larger calibers are not used because they ruin too much of the pig - a consideration that does not come into play in a shooting incident - and besides which, nobody is going to die if the pig is not instantly killed anyway. In shootings, just the opposite is true).

