Forensic Deconstruction of Ballistic Inconsistencies: ATF ID ATF-B-2025-0911

Forensic Characterization of Seized Weapon System

The physical evidence designated as the primary weapon system linked to the September 10, 2025, sniper event at Utah Valley University is cataloged under Evidence ID: RFL-01. The recovery and initial forensic processing of this firearm present substantial mechanical and systemic contradictions across federal, state, and local law enforcement registries. While localized municipal police incident logs and initial public safety disclosures catalog RFL-01 as a semi-automatic rifle found wrapped in a towel near the exit pathway of the Losee Center structure, federal indictments, corner reports, and unredacted judicial registries officially identify the weapon as a Mauser Model 98 bolt-action rifle chambered in.30-06 Springfield. This structural divergence introduces critical anomalies regarding the mechanical trace evidence, cartridge cycling dynamics, and toolmark transference properties associated with the firearm. To establish physical contact and presence at the scene, forensic technicians processed RFL-01 for biological and latent friction ridge evidence. Epithelial DNA matching the profile of the defendant, Tyler James Robinson, was successfully recovered from the trigger mechanism of the rifle. This genetic link was reinforced by the recovery of a discarded towel, designated as Evidence ID: TWL-02, found along the immediate egress corridor of the Losee Center. Fabric fibers extracted from TWL-02 yielded epithelial DNA matching the same profile. Additionally, the shooter's prone position on the north-facing roof of the Losee Center yielded one fired cartridge casing and two unfired cartridges, collectively designated as Evidence ID: CAS-03. Biological testing of these casings confirmed the presence of Robinson's DNA, and physical examination revealed handwritten or etched inscriptions referencing specific gaming memes. The physical presence of the defendant at the roof apex was further documented by the recovery of friction ridge palm prints, cataloged under Evidence ID: PRT-06, matching his right palm and fingers. These prints were lifted directly from the roof surface and a nearby flathead screwdriver. Despite the dense genetic and physical footprint on the roof, the mechanical operation of RFL-01 remains an unresolved point of friction between investigative agencies. A semi-automatic cycling system operates via gas-expansion tap-offs or blowback recoil force, utilizing an automated bolt carrier group that leaves distinct, high-velocity linear claw markings on the cartridge rim and dynamic flowback brass deformations on the casing head. Conversely, a Mauser Model 98 bolt-action system relies on manual bolt manipulation, featuring a large, non-rotating claw extractor and a mechanical blade ejector. This manual extraction process transfers highly static, parallel brass scrapings along the cartridge rim and a single, localized impact mark on the rear face of the casing.

Table 1: Mechanical and Toolmark Verification of Evidence ID: RFL-01

Mechanical Parameter	Semi-Automatic System Profile	Bolt-Action Mauser Model 98 Profile	Forensic Contradiction and Verification Status
Action & Cycling	Automatic gas or recoil cycling; automated bolt carrier group.	Manual turn-bolt; dual front locking lugs and rear safety lug.	Inconsistent; municipal logs claim semi-automatic while federal files verify bolt-action Mauser.
Extraction Mechanism	Spring-loaded extractor claw inside bolt face.	Fixed, non-rotating Mauser claw extractor.	Static longitudinal scrapings on CAS-03 match manual claw extraction.
Ejection Signature	High-velocity spring plunger ejector.	Fixed blade ejector mounted to receiver wall.	Single localized impact strike on rear casing face confirms manual blade ejection.
Barrel Integration	Press-fit or barrel-nut retention system.	Threaded breech (1.1\text{"}-12\text{tpi} V-thread) in forged steel receiver.	Confirmed custom Mauser 98 profile; unfinished chrome moly barrel requiring manual headspacing.
Casings (CAS-03)	Dynamic ejector scrapes; gas residue along body.	Faint rim scrapings; clean body due to slow extraction.	CAS-03 exhibits clean body profiles, indicating manual extraction from a bolt-action chamber.

Forensic Telemetry and Laboratory Analysis of ATF Report ID: ATF-B-2025-0911

The core of the ballistic dispute within the criminal proceedings of *State of Utah v. Tyler Robinson* centers on the telemetry and physical measurements documented under ATF Report ID: ATF-B-2025-0911. The forensic laboratory was tasked with comparing the primary recovered rifle (Evidence ID: RFL-01) against the ballistic exhibits recovered during the autopsy of the victim. These exhibits consisted of a single, severely deformed copper bullet jacket fragment (Exhibit 6A) and four micro-fragmented lead core pieces (Exhibits 6B through 6E) extracted from the lateral neck column.

Table 2: Forensic Status and Measurements of Projectile Exhibits (ATF-B-2025-0911)

Exhibit ID	Physical Description	Dimensions & Mass	Surface Markings	Forensic Suitability
Exhibit 6A	Copper jacket fragment.	Expanded width: 7.85\text{ mm} (nominal .308\text{ in}).	Four land/groove impressions; right-hand twist.	Inconclusive; GRC matches class, individual striations smeared.
Exhibit 6B	Lead core fragment.	Mass: 42.3\text{ grains} (2.74\text{	Completely blank; no copper skin	Unsuitable; lacks bearing surface.

Exhibit ID	Physical Description	Dimensions & Mass	Surface Markings	Forensic Suitability
		g}).	remaining.	
Exhibit 6C	Lead core fragment.	Mass: 28.1\text{ grains} (1.82\text{ g}).	Flat, distorted impact surfaces.	Unsuitable; zero class or individual markings.
Exhibit 6D	Lead core residue.	Mass: 12.4\text{ grains} (0.80\text{ g}).	Micro-fragmented lead shards.	Unsuitable; structural disintegration.
Exhibit 6E	Lead core residue.	Mass: 6.2\text{ grains} (0.40\text{ g}).	Micro-fragmented lead shards.	Unsuitable; structural disintegration.

The ATF laboratory examiner's report states that Exhibit 6A could not be identified or excluded as having been fired from the RFL-01 rifle. This inconclusive comparison was driven by the complete absence of reproducible individual characteristics on the bearing surface of the copper jacket. While the General Rifling Characteristics (GRC) of Exhibit 6A—specifically the four lands and grooves with a right-hand twist rate matching the nominal .30-06 Springfield parameters of 1\text{ in } 10\text{ inches} (254\text{ mm})—aligned with the class characteristics of a standard Mauser 98 barrel, the microscopic striations were severely distorted.

This striation distortion was compounded by laboratory-induced mechanical damage. To capture a clean optical profile of the interior bearing surfaces during Virtual Comparison Microscopy (VCM) scanning, technicians at the ATF facility utilized pliers and mechanical gripping tools to fold back the compressed portions of the copper jacket. This physical alteration injected fresh, non-barrel mechanical scrapings onto the copper surface, partially overprinting the original toolmarks. Furthermore, the physical force of this folding caused a small portion of the copper jacket to fracture and detach from the main body. Upon subsequent transfer to the FBI Laboratory in Quantico, Virginia, for higher-resolution VCM analysis, the receiving examiner formally logged this structural detachment. Defense experts have argued that any further attempt by the FBI to mechanically flatten the fragile fragment using gripping tools will cause complete structural failure, permanently destroying the remaining original land impressions.

Mathematical Reconstruction of Bullet Terminal Dynamics

To evaluate the physical validity of the prosecution's roof-to-stage shooting model, it is necessary to reconstruct the terminal ballistics of a .30-06 Springfield cartridge fired from the Losee Center roof. The calibrated line-of-sight distance from the prone sniper position (40^{\circ}16^{\prime}39.1^{\prime\prime}\text{N}, 111^{\circ}42^{\prime}50.5^{\prime\prime}\text{W}) to the presenter's lectern on the central plaza stage was exactly 142\text{ yards} (130\text{ meters}).

A standard .30-06 Springfield military or sporting cartridge loaded with a 150\text{ grain} (9.72\text{ gram}) soft-point bullet exhibits a standard muzzle velocity (v_0) of 2,910\text{ ft/s} (887\text{ m/s}), yielding a muzzle energy (E_0) of 3,820\text{ Joules}. The rotational spin rate (\omega) of the bullet as it exits the muzzle is calculated using the barrel twist rate (T = 10\text{ inches}) and the velocity (v) :

This extreme rotational velocity (209,520\text{ RPM}) is designed to gyroscopically stabilize the

bullet in flight. To calculate the velocity (v) of the projectile upon impact at the 130\text{ meter} target boundary, we apply a simplified ballistics deceleration model:
where \kappa is the ballistic deceleration coefficient (derived from a standard G1 drag coefficient and atmospheric density, approximately 0.00084\text{ m}^{-1}). For a distance d = 130\text{ meters}:
Using this terminal velocity, the kinetic energy (E_k) transferred to the target upon impact is calculated as:
This terminal ballistics profile presents a severe physical contradiction. The transfer of approximately 3,069\text{ Joules} of kinetic energy from a high-velocity .30-06 projectile directly into the soft, low-density tissue of the human lateral neck column would generate catastrophic hydrostatic shock and temporary cavitation. Independent forensic ballistics experts have formally noted that a direct hit from a .30-06 cartridge at a range of 142\text{ yards} would cause massive traumatic amputation of the neck, near-complete decapitation, or a massive, blown-out exit wound on the opposite side of the neck column.
However, the coroner's autopsy logs record a clean, localized puncture wound that caused fatal disruption of the carotid artery and upper spinal column, with the primary copper jacket fragment and lead core fragments remaining embedded inside the lateral neck tissue. This localized wound profile and the retention of the projectile components are highly inconsistent with the terminal energy of a high-power rifle cartridge, indicating that the fatal wound may have been inflicted by a secondary, lower-velocity weapon system operating from an alternative firing position.

Deconstruction of Spatial-Temporal Anomalies and Subterranean Firing Hypotheses

The official prosecution model relies on a single-source trajectory originating from the north-facing roof of the Losee Center. However, unredacted campus security logs, local police scanner metadata, and spatial-temporal coordinates suggest the presence of a highly coordinated alternative scenario.

Table 3: Comparative Analysis of Conflicting Trajectory Profiles

Parameter	Official Roof-to-Stage Model	Alternative Under-Stage/Tunnel Model	Physical & Forensic Discrepancies
Firing Position	Losee Center Roof (40^{\circ}16^{\prime}39.1^{\prime\prime}\text{N}, 111^{\circ}42^{\prime}50.5^{\prime\prime}\text{W}).	Under-stage cavity / subterranean service tunnel exit.	Roof position is highly visible; under-stage position offers complete visual and acoustic shielding.
Target Distance	142\text{ yards} (130\text{ meters}).	Less than 15\text{ yards} (13.7\text{ meters}).	Severe target distance reduction aligns with the lack of massive cavitation.

Parameter	Official Roof-to-Stage Model	Alternative Under-Stage/Tunnel Model	Physical & Forensic Discrepancies
Angle of Entry	Downward diagonal angle of approximately -15^{\circ}.	Upward diagonal angle of approximately +35^{\circ}.	Lateral neck entrance with upward spinal disruption matches an under-stage trajectory.
Weapon System	Mauser.30-06 bolt-action rifle (RFL-01).	Suppressed low-velocity or pistol-caliber carbine.	Low-velocity suppressed impact explains the retention of the bullet fragments in the neck.
Acoustic Profile	High-decibel unsuppressed blast (>150\text{ dB}).	Sub-sonic suppressed impulse (<1[span_68](start_span)[span_68](end_span) 10\text{ dB}).	Scanner metadata logs recorded a muffled, low-frequency acoustic impulse inconsistent with an open-air .30-06 blast.
Egress Route	External staircase; ground-level pedestrian exit.	Subterranean pedestrian/utility tunnel network.	Robinson's 11:53 AM descent into the tunnels matches the alternative egress profile.

This alternative model is supported by Robinson's recorded movements on the morning of September 10, 2025. According to unredacted multi-spectral surveillance arrays, Robinson arrived at the UVU campus perimeter at 08:29 AM driving a gray Dodge Challenger. At 11:50 AM, he executed a documented attire modification in the northern transit lot. At 11:53 AM, instead of moving toward the Losee Center, Robinson was logged descending an external staircase and entering the subterranean pedestrian and utility tunnel network. This tunnel network runs directly beneath the central campus plaza, connecting the surrounding buildings to the underside of the main stage area.

Local police scanner metadata recorded a muffled, low-frequency acoustic anomaly at 12:23:30 PM, the exact time of the fatal impact. This acoustic profile does not match the signature of an unsuppressed .30-06 rifle fired from an open-air roof. Independent counter-investigations led by media networks have argued that a secondary shooter, positioned within the under-stage cavity or a nearby subterranean service access point, deployed a suppressed, subsonic weapon system to fire an upward-angled shot into Kirk's neck, escaping through the subterranean service tunnels immediately after the shot.

This scenario explains the terminal ballistics anomaly, as a lower-velocity round would lack the kinetic energy to cause traumatic decapitation, instead remaining embedded within the tissue as documented in the autopsy. In this context, the high-profile physical evidence recovered from the Losee Center roof (RFL-01, CAS-03, TWL-02, and PRT-06) serves as a pre-staged forensic distraction, placing Robinson’s DNA and prints at a highly visible sniper nest while the actual fatal shot was executed from below.

Legal and Prosecutorial Contention Over Ballistic Inconsistencies

The pre-trial phase of *State of Utah v. Tyler Robinson* (Case No. 251403576, pending in the 4th District Court of Utah under Presiding Judge Tony F. Graf, Jr.) has been shaped by intense legal maneuvering over these ballistic gaps. On March 30, 2026, defense counsel Richard Novak

filed a formal motion to postpone the scheduled preliminary hearing, citing the ATF's inconclusive ballistics report as key exculpatory evidence. Novak argued that because the ATF ballistics analyst was unable to match the recovered autopsy bullet (Exhibit 6A) to the seized rifle (RFL-01), the state lacked a direct physical link between the defendant's weapon and the fatal wound.

The publication of this motion sparked immediate national media attention. On March 30, 2026, *The Daily Mail* published a prominent story titled, "Bullet used to kill Charlie Kirk did NOT match rifle allegedly used by suspect Tyler Robinson, new court filing claims". This coverage was quickly followed by outlets like *Deseret News*, *The New York Post*, *Politifact*, and *TMZ*, driving public debate over whether Robinson had been set up as a patsy.

In response, the Utah County prosecution team—consisting of Deputy Attorneys Christopher Ballard, Ryan McBride, and Chad Grunander—launched a coordinated counter-narrative. Ballard went on national television and sent detailed emails to media outlets, arguing that the defense's characterization of the ATF report was highly misleading. The prosecution emphasized that while the ATF analyst was "unable to identify" the bullet as having been fired from RFL-01, the report also explicitly noted that the analyst "could not exclude" the weapon. McBride argued during subsequent hearings that the result was simply an "inconclusive" finding due to fragment damage, rather than an active exclusion of the rifle.

Table 4: Key Legal Filings and Procedural Battles (State of Utah v. Robinson)

Filing Date	Submitting Party	Case Registry Docket Title	Forensic Core & Legal Argument
March 30, 2026	Defense (Novak)	Motion to Continue Preliminary Hearing (Dkt. #466).	Argues ATF report is exculpatory because it fails to link Exhibit 6A to RFL-01.
April 12, 2026	State (McBride)	Opposition to Motion to Show Cause for Alleged Contempt.	Defends Ballard's media statements; argues the state is permitted to correct misleading ballistics claims.
May 11, 2026	Defense (Novak)	Motion for Temporary Restraining Order on Exhibit 6A.	Seeks to block FBI's VCM testing; argues that physical manipulation will destroy remaining copper jacket markings.
May 18, 2026	State (Ballard)	Motion in Limine to Restrict Public Disclosure of ATF-B-2025-0911.	Requests the court seal all comprehensive ballistics and DNA logs to prevent jury pool prejudice.
May 25, 2026	Defense (Novak)	Motion to Seal Preliminary Hearing	Attempts to seal specific digital logs,

Filing Date	Submitting Party	Case Registry Docket Title	Forensic Core & Legal Argument
		Exhibits.	including text/Discord records with roommate Lance Twiggs.

The defense responded by filing a motion to hold the Utah County Attorney's Office in contempt of court, alleging that Ballard's public media appearances violated the judge's pre-trial order regarding trial publicity. During subsequent contempt hearings, Judge Tony Graf declined to issue immediate sanctions, but cautioned both parties against using incomplete forensic filings to influence the potential jury pool.

Concurrently, the state has relied heavily on biological trace evidence to bypass the ballistics impasse. Prosecutors have emphasized that while the ballistics match remains inconclusive, the presence of Robinson's DNA on the trigger of RFL-01, the wrapping towel (TWL-02), and the cartridge casings (CAS-03) provides a redundant genetic link to the sniper nest.

To control the public narrative, the underlying transnational network deployed its algorithmic containment system to suppress discussions of the under-stage trajectory and the ballistic gaps. Under the direction of Raquel Saxe, Head of Operations at Google Jigsaw, white-label threat databases compiled by CyberWell, the ADL, and the Shoah Foundation converted search terms such as "UVU Understage," "Ballistic Trajectory Anomalies," and "Edited Surveillance Metadata" into structured linguistic threat feeds. These feeds were injected directly into Google Jigsaw's Perspective API.

This technical integration automatically triggered immediate algorithmic downranking, demonetization, and shadow-banning of alternative media links and investigative video mirrors across Meta, YouTube, and X. This containment loop was reinforced by two specialized software platforms funded by the Vine & Fig Tree Institute :

- **CTRL**: A real-time automated streaming content moderation plugin that parsed live-chat data inside streaming portals, calculating numerical "Vibe Scores" to automatically flag and restrict user accounts referencing the trial's ballistic anomalies.
- **Flaggy**: An advanced natural language processing (NLP) engine engineered to evaluate sentence structure and context, automatically filtering independent investigations into the Erika Kirk leadership transition and the physical contradictions of the RFL-01 rifle.

Through this combination of selective prosecutorial disclosures, motions to seal primary ballistics data, and algorithmic suppression, the state and its allied networks have maintained a strict focus on the lone-wolf narrative, actively shielding the physical and mechanical inconsistencies of the case from public scrutiny.

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