



TEXAS RANGERS



DEPARTMENT OF PUBLIC SAFETY INTEROFFICE MEMORANDUM

DATE: 9/10/99

DIVISION: Ranger

TO: Chief Bruce Casteel, Headquarters, Austin

FROM: Sergeant Joey D. Gordon, Company "F", Llano

SUBJECT: Review of Evidence Related to the Branch Davidian Investigation

On 06-14-99, you assigned me to review the evidence, which is held by the Texas Department of Public Safety, Texas Ranger Division, File No. RF093021 (Capital Murder – Steve WILLIS W/M, Age 32 on 02-28-93), this being the Branch Davidian investigation in Waco. There is approximately 24,000 pounds of evidence stored both in Waco and in Austin. My instructions were to review the evidence in Austin and notify you of any significant evidence identified. You also informed me of a piece of evidence which was questionable, a 40 mm shell casing found by Ranger Sergeant George TURNER in Sector EC1 at the Mt. CARMEL Center. I began to review the tapes and photographs provided to me by Ranger Captain Charlie BRUNE. It should be noted that the photographs that I viewed were only a portion of the total photographs taken. It is my understanding that the FEDERAL BUREAU OF INVESTIGATION (FBI) had taken all of the 35 mm film, negatives, and, reference material into their possession and only a limited number of photographs were returned to the Texas Department of Public Safety.

Before the review of all evidence provided by Captain BRUNE was completed, an investigation of the 40 mm shell casing was initiated in order to identify it. Sergeant TURNER had already provided you with an explanation as to his locating it and the explanation of its use that was provided to him by the Federal Bureau of

Investigation. Sgt. TURNER'S report to you, an aerial photograph of Mt. CARMEL Center, and a diagram with sectors drawn on it is ATTACHMENT A. In Sgt. TURNER'S report, the 40 mm shell casing is identified as EXHIBIT Q1237. Sgt. TURNER reported that FBI Special Agent Rick CRUM checked on Q1237, and advised that the shell casing did belong to the FBI. Sergeant TURNER also reported that CRUM said it had been fired after obtaining permission, in an attempt to knock a door down so gas could be dispensed. Sgt. TURNER also collected 40mm "FERRET" liquid CS casings and knew that Q1237 was different. ATTACHMENT B is photographs of an expended casing, projectiles, and packaging of "FERRET" rounds.

The shell casing Q1237 is a green-colored metal 40 mm shell casing which has six (6) square shouldered notches or cuts equally spaced located around the rim and has the ink markings:

AMM	LOT	NO.	NCI
3 - 38	- 1	0769	
40 mm	M118	HA-32-9-68	

On 07-22-99, I took custody of Q1237 to begin to fully identify it. I had digital photographs taken of Q1237, which is ATTACHMENT C, to aid in its identification. On 07-30-99, I had the DPS Laboratory collect trace element samples from Q1237 for future analysis as needed. ATTACHMENT C contains the packaging and all items found with the 40 mm shell casing.

I enlisted the assistance of the U.S. Army, U.S. Army Research and Development Engineering Center (ARDEC), and Rock Island Arsenal among others to help in identifying Q1237.

The first two lines in the above marking are in red ink and the third or bottom line is in black ink. The markings in red identify the completed round as: ammunition from Lot number NCI 3-38-1, which was made by Northrop Carolina, Inc. in July of 1969. Investigation revealed that Northrop Carolina, Inc. (NCI) of P.O. Box 3049, Asheville, North Carolina was opened on 09-21-65 and merged with another company on 03-

26-79. In 1998, C.T. Corporation of 225 Hillsbough Street, Raleigh, North Carolina, reserves the NCI trademark. However, on 07-30-99 C.T. Corp. advised that NCI was in name only and no records of the original company were known.

A military "Ammunition Data Card" was located for Lot number NCI 3-38; this is ATTACHMENT D. This data card indicates that the production for lot number NCI 3-38 was begun on 07-29-69 and was completed and shipped on 08-11-69. This data card would indicate that NCI 3-38 munitions correspond to Q1237 shell casing's markings and are within a three (3) day period of time, thirty (30) years ago. The differences between Q1237 and the Data Card for Lot NCI 3-38 are that the casing for Q1237 is made by "HA" not NCI, and there is a "-1" in the Lot number on Q1237. The data card shows that the casings for NCI 3-38 were to be made by NCI and there is no "-1".

The third line in black ink on the shell casing indicates it is a 40 mm casing, the casing model number is an M118; it was made by HA, in lot number 9-32 in September of 1968. The "HA" is Harvey Aluminum, Inc. of 19200 Southwest Avenue, Torrance, California. Investigation revealed that Harvey Aluminum is now an inactive company and is now part of Martin Marietta Aluminum Division at 19600 Southwest Avenue, Torrance, California. No data card for Lot number NCI-3-38-1 could be found; however, the "-1" could be explained due to HA cases being used to complete the order originally using NCI cases. This alteration would require a change be reflected in the lot number, hence the "-1". This was confirmed when original loaded cartridges of lot number NCI 3-38-1 were located at the Pine Bluff Arsenal in Pine Bluff, Arkansas by Criminal Investigator Terence "O'D" O'DONNELL of the Department of Defense Industrial Operations Command, Rock Island Arsenal. Investigator O'DONNELL ordered two (2) of these cartridges held for this investigation. Ranger Sergeant Howard DUNHAM took custody of these two (2) cartridges on 09-07-99. Investigator O'DONNELL had e-mailed to me photographs of one of these live cartridges from lot number NCI 3-38-1, and these photographs are ATTACHMENT E.

These cartridges are early experimental M651 rounds used by the U.S. Government. They are designated under item nomenclature as CTG. 40 mm XM651E1, CS. The DODIC is B567 and the National Stock Number (NSN) is 1310-00-849-2083. This corresponds with the exact data found on the Ammunition Data Card for Lot Number NCI 3-38. The data card indicates that Diagram 122-2-6 would be of the XM651E1 cartridge. Diagram 122-2-6 is ATTACHMENT F and matches Q1237.

I obtained an Operator's Manual for NSN 1310-00-849-2083, the 40 mm TACTICAL CS, M651. To be more accurate in information about an older cartridge, I obtained Technical Manual TM 3-1310-243-10 from January 1975, which is ATTACHMENT G. This manual indicates that this cartridge has a projectile that delivers a CS agent and is fired from a 40 mm casing. This casing has six equally spaced notches located around the cartridge case base. When fired, the projectile disperses CS into the atmosphere by the burning of a pyrotechnic mixture. The manual, on page 10, reports the burning time to be 20 to 30 seconds, and the projectile carries 53 grams or 2 ounces of CS agent –pyrotechnic mixture. This projectile is gray in color with a red band. The red indicates that this is a non-persistent-effect irritant agent.

The manual states, on page 11, that the M651 cartridges are not explosives rounds; however, a malfunctioning projectile may explode upon impact. The M651 projectile is reported capable of penetrating window glass and up to $\frac{3}{4}$ inch pinewood at 200 meters and then delivering the CS agent. The max range is 400 meters. The manual for the M651 cautions that the projectile will cause injury to personnel in its path when fired. The diagram on page 7 and the description of the cartridge identification on page 14 indicate that the cartridge nomenclature should be marked on the base of the case. However, a note on page 14 also indicates that the lot number and nomenclature may be on the side of the case, which is consistent with Q1237.

No reference or fire hazard warning is provided in the manual, so I asked Investigator O'DONNELL to research what he could about tests conducted when the M651 was being developed to determine the realistic degree of hazards of starting a fire. On 08-

31-99, Investigator O'DONNELL advised me that he had consulted Ray JOHNSON who is currently the DECON/MUNITIONS Team Leader for the Soldier's Biological Chemicals Command at Rock Island Arsenal. JOHNSON advised that they had not explored the fire hazard of the M651 because it was known to cause fires. The projectile burns at 500 to 700 degrees Fahrenheit, and is capable of igniting flammable items. JOHNSON also advised that the military had no official definition of a pyrotechnic round but that the M651 was considered a pyrotechnic round by the military.

Investigator O'DONNELL also advised that no shipping records could be found on lot number NCI 3-38-1. These records are normally maintained for two (2) years.

It was of interest that Investigator O'DONNELL advised me on 08-27-99, that numerous inquiries from the news media and FBI personnel had been made to arsenals about the M651 and the fire potential following the news events of the preceding days.

I also requested that Investigator O'DONNELL research and provide me with a breakdown of the active ingredients in the M651. His report to me is ATTACHMENT H. It reports that the active ingredient in the M651E1 is: CS = o-Chlorobenzalmalononitrile (Mil-R-51029C) and the pyrotechnic mixture is the standard fuel/oxidizer/coolant formulation used on many smoke munitions. This being:

Agent (CS)	40%
Fuel (Sugar)	18%
Oxidizer (Potassium Chlorate)	27%
Coolant (Magnesium Carbonate)	12%
Binder (Nitrocellulose)	3%

On 09-03-99, I received a Technical Data Packet (TDP) for the XM651E1 round from Investigator O'DONNELL. It is included as an ADDENDUM to ATTACHMENT H; because of its irregular size and is printed separately.

During my review of the photographs in evidence, I found a photograph of a projectile that is gray with a red band lying in water. A copy of this photograph is ATTACHMENT I. There is no location number or photographer identified on the photograph. I had the lab photographers look at the photograph and none recalled taking the photograph. DPS Photographer Mike HOLLE advised that he took some photographs in an area with standing water which was near the bottom of Sector F or the top of Sector A, and he advised that he could have taken the photograph. DPS Photo Lab personnel advised that they had made detailed notes on each photograph taken, and they could give the location, photographer, settings, and other detail information about each picture. However, the FBI had taken all their notes and negatives and this left them with nothing to reference. It should be noted that in the photographs and videos of the Mt. Carmel Center taken after the fire, I observed standing water in numerous locations.

The gray/red banded projectile in the photograph, ATTACHMENT I, appears to be expended and has a brown/black (tar-colored) mark on the ogive. The projectile is not burned and is not a cooked-off round. Documentary filmmaker Mike McNULTY was unable to find this projectile in the DPS evidence when he searched for it. At this time, it is unknown what the photographed projectile's "Q" number or evidence number is; however, it is physically the same as the projectile to be mated with Q1237.

Ranger Lieutenant James MILLER, who was in charge of evidence collection at Waco, looked through his notes and records and found two (2) items in evidence held at Waco that could possibly be the gray and red-banded projectile. C548 was labeled as a "fired tear gas projectile" and C596 was labeled as a "fired tear gas shell." On 09-03-99, Lt. MILLER, Capt. BRUNE, and myself traveled to Waco and located these items; however, neither were the gray and red-banded projectile. C548 was an expended "FERRET" projectile, and C596 was the capsule of a M583A1 "WHITESTAR" parachute flare which was found in Sector F-C6A by Ranger Sergeant George FRAISER (now retired).

To conduct a proper search for this and other items, a detail inventory of all evidence will be made in preparation for release to the Clerk of the United States District Court for the Western District of Texas.

The location where the shell casing Q1237 was found may have no relationship to where it was fired. The shell casing was recovered in Sector E by Sgt. TURNER. It is possible that this is where one of the FBI's Hostage Rescue Team's (HRT) armored vehicles was cleaned out following the assault on the Mt. CARMEL Center by the use of 40 mm "FERRET" rounds.

Two other pieces of evidence held to be fully identified were two 40 mm projectiles identified as Q379 and Q380 which were recovered by Sgt. FRAISER in Sector F. These projectiles are similar in make, markings, size, and dimensions to each other. They differ in degree of exposure. Both have been fired and expended, and both have a black plastic nose covering the ogive, which is unbroken. One projectile shows more scratches and marks on this plastic covering than the other. "40 AG DM 118 A1" is stamped into the base of both projectiles. Neither projectile is burned nor are they cooked off rounds, and both have rifling marks made by lands on the rotating band, meaning they have been fired from a weapon. I had digital photographs made of one of these projectiles to aid in identification. These photographs are ATTACHMENT J.

The measurements and the stampings of these projectiles are not standard and are inconsistent with each other; therefore, military records and JANES INFORMATION GROUP were unable to identify them. I made a diagram of the measurements of these projectiles, which is included as ATTACHMENT K.

During the investigation to identify these projectiles, Q379 and Q380, I made contact with Fred PICKLER and Peter McAULEY of NICO Pyrotechnik. I provided them with the photographs in ATTACHMENT J. After viewing the photographs and consulting with the NICO German engineers, Peter McAULEY advised that the projectile did appear to be of NICO manufacture.

Peter McAULEY further advised that during the early 1990's, U.S. Law Enforcement was inquiring about a sound and flash projectile that could accurately be deployed and cause a distraction in special situations. The FBI had been one of those law enforcement agencies that were making inquiries. NICO already made a DM118 A1 round for the German Army that was a practice round. This round was a 40 mm cartridge that propelled a projectile with a tracer compound in the base and an orange "impact signature" marker compound in the nose. The DM 118 A1 would fire at about 78 meters per second, leave a visible tracer to the rear and then an orange chalk mark upon impact. These projectiles were of aluminum construction and had a black plastic covering over the ogive. The stamping on the base means it is a 40 mm, the AG is an abbreviation for cartridge/practice or training cartridge in German, DM is the international designation for German manufacture, 118 is the German Army's number for this training round, and the A1 designates that it has been modified or is a newer version than the original DM 118. I received a diagram and information on the DM 118A1 from ARDEC and it is ATTACHMENT L.

To facilitate the U.S. Law Enforcement request for a sound and flash cartridge, NICO used the 40 AG DM118 A1 projectiles, which they already made, to modify for the sound and flash cartridges. These projectiles were modified to hold a report composition in the nose, which would make a flash and sound similar to a "flash bang" but of less intensity, about 130 dBA. These projectiles had no tracer capability and would discharge at about 100 meters or 1.3 seconds.

The modification of the DM118A1 to the Sound and Flash round was accomplished by drilling out the center of the DM118A1 projectile and inserting a "blast chamber housing." This blast chamber housing is a cylindrically shaped piece of aluminum, which has a small hole in the center from the base up to just short of halfway where a large open cavity then is bored to the mouth. The small hole is the delay column and the large open cavity is for the report compound. The blast chamber housing is then span into the projectile body and secured with "Loctite 270."

The delay column uses a mixture of 80% silicium powder (Si) and 20% red lead (Pb3 04) to burn in the lower part of the hole through the base. This is ignited by the cartridge propellant, which is a nitrocellulose. This delay charge burns at a consistent rate and then ignites a column of pressed black powder. This in turn ignites the report compound that consists of aluminum powder and potassium perchlorate. This composition was being used by NICO in hand-held sound and flash devices, and the company had done extensive testing of this composition with regards to fires, noise, and flash. This composition did not start fires when tested on straw, a sofa, against curtain material, and kerosene. It did ignite gasoline. These projectiles were NICO 40 mm x 46 sound and flash (S & F) cartridges of a prototype design, and there were only approximately 1000 made in about 1990. The report (sound and flash) was discharged from the nose of the projectile, and during testing, it was found that the projectile could be propelled in an undesirable direction under certain circumstances. The design was subsequently modified for volume production to correct this problem. Projectiles marked 40 AG DM 118 A1 are no longer used for the basis of this cartridge. Since these rounds were developed to NICO's "Technical Specifications and Acceptance Regulations" for U.S. Law Enforcement and not to MILSPECS; there can be confusion in trying to identify these rounds.

These rounds were to provide law enforcement the ability to accurately place a distraction device into a desired area even through a barrier if needed. The cartridge should penetrate about 40 mm at 40 meters. The plastic nose will break on impact when striking something hard. Peter McAULEY advised that reviewing the pictures indicate that the projectile was utilized as designed and was aerially deployed without making penetration of any barriers. Fred PICKLER inspected Q379 and Q380 in Austin on 08-25-99 and concurred. The written correspondence I have received from NICO is ATTACHMENT M and includes a diagram of the 40 mm X 46 (S & F) as made in the prototype design like Q379 and Q380.

Peter McAULEY advised that due to the time involved it would take some time to find customers records from 1990 that purchased the prototype cartridges. An engineer at the German factory remembered possibly about 10 cartridges being sent to the

USA. He also recalls they may have been shipped through distributor FFE International. This is Frost Family Enterprise International managed by Jack FROST. FROST is a retired Colonel from the U.S. Army and has been a consultant for Mike McNULTY and accompanied McNULTY at the DPS evidence locker. Mike McNULTY advised that Col. FROST had delivered about 50 NICO cartridges to the FBI HRT back in the early 1990's, but Col. FROST also advised that Q379 and Q380 were made by ARGUS. Col. FROST also pointed out that Q379 and Q380 were mislabeled as CS gas projectiles on the evidence packaging. Col. FROST was correct about the mislabeled packaging; however, these projectiles do not seem to be of ARGUS manufacture.

ARGUS is an Austrian Arms Company ARMATUREN GESELLSCHAFT, Phone E 437 673 27810. Mike McNULTY sent to me a diagram of the projectile he believes Q379 and Q380 to be. The diagram of ARGUS 40 mm x 46 FLASHBANG 93 does not appear to match. This diagram is ATTACHMENT N. Mike McNULTY also advised me that his tests indicate that Aluminum powder, extruded iron oxide, and no potassium perchlorate were in Q379 and Q380. This leads Mike McNULTY to believe they were changed since potassium perchlorate is needed in a flashbang and should be in the compound.

To address the issue of tampering or alteration of these projectiles, I had the DPS Lab take samples for trace element testing from the nose and base of both Q379 and Q380. For future comparison and identification, Q1237, Q379, and Q380 were extensively photographed and ballistic evidence taken by the Lab.

I also learned how the NICO 40mm x 46 S & F cartridge is made and functions and how the XM651E1 functions. Shell casing, Q1237, is a M118 shell casing, which expels gases from the high pressure chamber in the center of the case, toward the inside of the case wall into the low pressure chamber. This places pressure on the base of the projectile, which is held into the case by a crimp at the case mouth. The pressure at the base of the projectile will overcome the crimp and the projectile will be propelled out the barrel. Projectiles Q379 and Q380 are fired from another type

casing which forces gases straight up into the base of the projectile and into a low pressure chamber until a predetermined level of pressure is reached. The projectile is held to the casing by a threaded column at the high pressure chamber. At the predetermined level of pressure, the threaded column breaks, and the projectile moves down the barrel and the delay column is ignited. These two separate deploying systems are not easily compatible with each other, and it seems very unlikely that Q1237 had anything to do with Q379 and Q380.

The NICO 40mm x 46 S & F report composition is of potassium perchlorate and aluminum powder. The potassium perchlorate is water soluble and both Q379 and Q380 were exposed to the outside elements for an unknown period of time. It is also unknown what type of tests were performed on Q379 and Q380 before I took custody of them. Also, since chemicals change physical states and molecular composition during a chemical reaction, I asked for assistance from the Director of the DPS Crime Lab Ron URBANOVSKY. He advised that he would research what chemical elements need to be searched for to determine if Potassium perchloate was present before the report composition was ignited.

By learning of the manner in which the NICO 40mm x 46 S & F cartridge is made, it is not easily altered, although it is not impossible. From what I have learned, Q379 and Q380 do not appear to have been altered; however, until all tests are completed and chemical evidence compared and evaluated, it cannot be concluded.

Mike MCNULTY has advised me that other evidence held by DPS is crucial to proving some of his suspicions that the FBI and ATF have not been truthful in their account of the Branch Davidian investigation. Mike McNULTY advised:

- A. That flash bangs had been misidentified as firearm silencers and, thus, overlooked as key evidence in the investigation of the fire;
- B. That a "watch cap" worn by Michael SCHROEDER, who was killed on 02-28-93, may contain powder residue showing he was shot at close range contradicting the shooting report;

- C. That a “shape charge” may have been placed on the concrete roof of the “bunker” at the bottom of the tower, and that a bedroll found in the “bunker,” which was not totally consumed by the fire, may contain trace elements of the explosive compound from the “shape charge” and;
- D. That video tapes and pictures could be key in identifying elite military personnel such as Delta Force personnel who were at the scene.

As per your instruction, when all the evidence is inventoried for transfer to the Clerk of the U.S. District Court for the Western District of Texas, the above items of evidence will be identified and boxed separately with other significant evidence. This will clearly identify this evidence for easy access for future investigators.

Also, Mike McNULTY has questioned .308 Winchester cases located at the undercover house, which may show that the FBI snipers fired rounds on 04-19-93. The under cover house A and B were located near the Mount Carmel Center and were used by law enforcement officials prior to the ATF raid on February 28, and during the stand-off between the Davidians and law enforcement. The recovery of these casings was reported by Ranger Sergeant Ronny GRIFFITH in Report RF093021-U.12. A manila envelope marked U-12 contains this report, the original handwritten report, and notes and photographs of the scene. In the report, Sgt. GRIFFITH reports the recovery of:

- A. Twelve (12) .308 F.C. cases and twenty four (24) .223 IMI cases recovered at Undercover House A;
- B. Three (3) .45 cal. shell casings recovered between Undercover House A and B; and,
- C. One (1) 22-250 casing recovered in the driveway of Undercover House B.

These casings will also be placed with the above evidence.

Also, as reported to you earlier in this report, part of an M583A1 "WHITESTAR" parachute flare was found among the evidence. Since this is incendiary in nature, it and all the other flares identified will be separated and boxed.

In concluding this first report to you, I am including a copy of a letter I received on 08-31-99 from AUSA Bill JOHNSTON to Attorney General Janet RENO giving his perspective on this investigation. With AUSA JOHNSTON'S permission, this letter is ATTACHMENT O.

I will keep you informed by memorandum, as efforts continue to locate and identify questionable evidence, including the M 651 projectile. Also, when test results and other outstanding information is received, I will report to you promptly.