

THE HISTORY OF U.S. ARMY BOMB DISPOSAL
AND
EXPLOSIVE ORDNANCE DISPOSAL
1941 THRU 1980

COMPILED BY
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U.S. ARMY EOD

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BD/EOD TECHNICIANS HONOR ROLL

The names listed below are of those individuals who gave their lives in the performance of their duties as BD/EOD technicians. In most cases, the individuals listed are not classified as heros because they were killed while performing their duties as BD/EOD technicians. It really makes little difference whether they were called heros or not; for each and everyone of them was a member of a very special organization. The BD/EOD organization has always been very unique in the U.S. Army because it carries out its mission during both war and peace time. When the call for help goes out, EOD can be counted on to respond regardless of how great the danger might be.

1. LT Rodger, June 1943
2. T/SGT Rapp, June 1943

From the available records, it appears that LT Rodger and T/SGT Rapp have the unfortunate distinction of being the first U.S. Army BD technicians killed in WW II. They were both members of the 5th Ord BD Squad which was the first BD unit to participate in an invasion in WW II. The 5th BD Squad was part of the Attu Invasion Force in the Aleutian Islands. They were killed in action while carrying out BD operations a few days after landing on Attu Island.

3. LT William F. Farris, June 1943
4. LT John A. Randall, June 1943

LTs Farris and Randall were killed when a sea mine that they were attempting to render safe exploded. Their's was the first of several deaths which resulted from U.S. Army BD personnel being called on to render safe items of underwater ordnance for which they had not been trained.

5. 1LT Delafield H. Wyckoff, 18 July 1943

At the time of his death; LT Wyckoff was a member of 237th Ord BD Company. LT Wyckoff had been assigned as the BD Officer for the Mandu Assault Landings in New Georgia. While enroute to New Georgia, LT Wyckoff's ship was engaged by the Japanese and sunk. LT Wyckoff was listed as KIA at sea.

6. 1LT Frank E. Smith JR, 17 October 1943
7. SGT Carl E. Christensen, 17 October 1943
8. PFC J. Gatti, 17 October 1943

LT Smith, SGT Christensen, and PFC Gatti were members of the 236th Ord BD Company at the time of their deaths. They were killed while carrying out BD operations near Naples, Italy.

9. SGT Alfred F. Sanders, 22 December 1943

SGT Sanders was a member of the 105th Ord BD Squad at the time of his death. The 105th BD Squad was assigned to the island of Espiritu Santo in the New Hebrides. SGT Sanders was carrying out some experimental work on Japanese and American ordnance when he was killed by an explosion.

10. T/SGT John Blasko, 18 April 1944
11. SGT Carmine C. Nicastro, 18 April 1944
12. T/5 Dominick L. Albanese, 18 April 1944

T/SGT Blasko, SGT Nicastro, and T/5 Albanese were members of the 57th Ord BD Squad at the time of their deaths. They were killed when a captured German ammunition dump near Biguglia, Corsica exploded while they were clearing the ammunition.

13. T/SGT William C. Tait, 9 July 1944

T/SGT Tait was a member of the 6th Ord BD Squad when he was killed during BD operations in France.

14. 1LT Bertram Ostro, 10 August 1944

LT Ostro was returning to his unit near the Normandy Beach when his jeep passed over two mines which exploded killing him instantly.

15. 2LT Charles F. Hale, 12 October 1944 (133rd BD Squad)
16. 1LT Sherwood L. Racey, 12 October 1944 (146th BD Squad)
17. T/5 Robert F. Chapman, SW 12 October 1944, DOW 21 October 1944 (146th BD Squad)

The 133rd and 146th Ord BD Squads were working together near Besancon, France when 2LT Hale, 1LT Racey, and T/5 Chapman were killed. While inspecting some captured German ordnance, a new type of fuze was found. While disassembling the fuze for intelligence purposes, the fuze exploded killing both LTs Hale and Racey, and

seriously wounded T/5 Chapman. T/5 Chapman died from his wounds nine days later.

18. T/5 Donald E. Bailey, 29 October 1944

T/5 Bailey was a member of the 20th Ord BD Squad when he was killed. The 20th BD Squad was providing BD support to the U.S. Army units which had been besieging the city of Aachen, Germany for some time. During this period, the 20th BD Squad had been under German artillery fire several times a day. During one of these barrages, T/5 Bailey was hit by a piece of shrapnel which passed through his head. He died shortly after arriving at the field hospital.

19. T/5 Frank L. Dickinson, 27 February 1945

T/5 Dickinson was a member of the 131st Ord BD Squad when he was killed. His unit had been tasked with the collection of U.S and German ordnance located on or near the MSRs. The 131st was using ammo handlers and truck drivers from units in their area. T/5 Dickinson was using a driver and four ammo handlers to assist him. T/5 Dickinson had been instructed to unload the ordnance in the ammo storage area near Distorff, France. He had unloaded the German ammo in the captured ammo storage area and was in route to the U.S. ammo storage area in the ASP when his truck exploded killing him, the driver and the four ammo handlers.

20. T/5 Donald W. Vickers, 20 March 1945

T/5 Vickers was a member of the 50th Ord BD Squad when he was killed. The 50th BD Squad was checking some captured German munitions prior to moving them to a holding area. T/5 Vickers picked up a German mine to check it when it exploded killing him instantly. At the time of his death his unit was operating in Braives, Belgium.

21. T/5 Joseph F. Fedele, 20 March 1945

T/5 Fedele was a member of the 67th Ord BD Squad when he was killed. The 67th BD Squad was clearing UXBs near Bar Le Duc, France when one of the bombs exploded killing T/5 Fedele.

22. CPT George C. Sarauw, 18 April 1945
23. 2LT Arthur J. Zellmer, 18 April 1945
24. T/SGT Francis H. Zurn, 18 April 1945
25. T/5 Raymond J. Rondeau, 18 April 1945
26. T/5 Elmer J. Craddock, 18 April 1945

CPT Sarauw, 2LT Zellmer, T/SGT Zurn, T/5 Rondeau, and T/5 Craddock were all members of the 92nd Ord BD Squad when they were killed. They were participating in the assault landing on Ie Jima Ryukyu Island when their vehicle detonated a mine killing everyone.

27. 1LT Earl M. Hamilton, 7 May 1945

LT Hamilton was killed in action during BD operations in Verona, Italy.

28. CPT Raymond L. Batershell, 18 May 1945
29. T/5 George H. Beggs, 18 May 1945
30. T/5 Harry Pollock, 18 May 1945

CPT Batershell, T/5 Beggs, and T/5 Pollock were members of the 154th Ord BD Squad at the time of their deaths. They were investigating an abandoned truck load of German munitions when it exploded killing everyone present.

31. CPT Richard A. Metress, 8 June 1945
32. T/SGT Howard A. Laith, 8 June 1945
33. T/5 William J. Hackett, 8 June 1945
34. T/5 Anthony Piergrossi, 8 June 1945

CPT Metress, T/SGT Laith, T/5 Hackett, and T/5 Piergrossi were members of the 209th Ord BD Squad at the time of their deaths. The 209th BD Squad was assigned to the island of Mandog Mindanao in the Philippines when it was called upon to render safe a Japanese depth charge. As there were no Navy MD or BD personnel available, CPT Metress was attempting to disarm the depth charge when it detonated killing everyone present.

35. CPT Samuel R. Brough, 10 July 1945
36. T/5 John Becki, 10 July 1945

CPT Brough and T/5 Becki were members of the 99th Ord BD Squad when they were killed. In preparation for a sea dump off the island of Okinawa, the 99th BD Squad was loading Japanese ordnance on their truck in a holding area when the truck load of ordnance exploded killing CPT Brough, T/5 Becki, and several other personnel in the area.

37. T/5 Walter E. Louthan, 21/22 July 1945
38. T/5 Clinton E. Geer, SW 21/22 July 1945, DOW 29 July 1945

T/5s Louthan and Geer were members of the 33rd Ord BD Squad at the time of their deaths. They were using German POWs to remove a large quantity of black powder from a German black powder depot just outside of Nurnberg, Germany. There was a sudden flash fire and explosion which killed T/5 Louthan and several German POWs. T/5 Geer was burned severely and died from his injuries on 29 July 1945.

39. 2LT Leonard K. Tunderman, 30 December 1945

LT Tunderman was a member of the 93rd Ord BD Squad at the time of his death. LT Tunderman was killed while disposing of Japanese bombs in the area of Yonan, Korea.

40. PVT Jack V. Austin, 26 July 1946

PVT Austin was a member of the 72nd Ord BD Squad at the time of his death. The 72nd BD Squad had been tasked with locating and collecting for disposal all German ordnance in ASPs and munition caches in the area of Regensburg, Germany. Much of this ammunition was booby trapped or in very poor condition from improper storage. PVT Austin was unloading an 88 MM projectile from a truck load of ordnance that had been collected when it exploded in his arms killing him instantly.

41. MSG John F. Faulkner, 18 September 1947

MSG Faulkner was assigned as a BD technician to the 558th Ord MAM Company when he was killed, MSG Faulkner was killed while carrying out BD operations and disposal in the area of Bad Aibling, Germany.

42. PVT Charles A. Jones, 18 April 1950
43. PFC Harold L. Sloppy, SW 18 April 1950, DOW 25 April 1950

PVT Jones and PFC Sloppy were students in the EOD School at Aberdeen Proving Ground, Maryland at the time of their deaths. They were in a shaft setting up a bomb for the class that was to follow them. PVT Jones was preparing a supposedly inert M103 nose fuze when it exploded killing him and wounding several other students. PFC Sloppy died seven days later.

44. MSG Norman R. Durfee, 18 June 1952

MSG Durfee was a member of the 60th EOD Detachment at the time of his death, MSG Durfee was killed by an explosion while performing a range clearance on the FT Dix, N.J. grenade range.

45. MSG Frank R. Holley, 18 November 1953

MSG Holley was killed while assigned to an EOD unit in Yengam-Ni, South Korea. MSG Holley was in a demo pit preparing propellant for destruction when the pit experienced a sudden flash fire which resulted in an explosion killing MSG Holley.

46. MSG Albert J. Baron, 16 December 1953

MSG Baron was a member of the 24th EODC Detachment at the time of his death. MSG Baron was attempting to remove the explosive filler from a projectile that was to be used as a training aid, when it exploded killing him instantly and severely wounded another EOD technician who was near by at the time of the explosion.

47. CPT Carl W. Johnson, 12 February 1954

CPT Johnson was a member of the 20th EOD Detachment at the time of his death. CPT Johnson was working on a demolition range in Miesau, Germany when a 3.5 inch rocket exploded killing him instantly.

48. SFC Ralph W. Poole, 3 May 1954

SFC Poole was a member of the 552nd EODC Detachment at the time of his death. SFC Poole was participating in a range clearance operation at FT Lewis, Washington when a MT fuzed projectile that he had picked up detonated killing him instantly.

49. CPL Robert J. Roberge, 8 September 1954

CPL Roberge was a member of the 60th EOD Detachment at the time of his death. CPL Roberge was killed by an explosion while performing a range clearance on the FT Dix, N.J. grenade range.

50. PVT Michael Costagliola, 18 December 1957

PVT Costagliola was a student at the EOD School, Indian Head, MD when he was killed by an explosion.

51. SFC Richard A. Knox, 4 December 1963

SFC Knox was a member of the 547th EODC Detachment at the time of his death. SFC Knox was giving a pre ATT to the 13th EOD Detachment, Huntsville, AL when he was killed by a supposedly inert M103 nose fuze that he had removed from the training aids belonging to the 13th EOD.

52. SP5 Betuel A. Perez, June 1964

SP5 Perez was assigned to an EOD unit in Panama at the time of his death. SP5 Perez was killed when a pipe bomb that he was disassembling detonated.

53. 1LT Richard Deigert, 10 June 1965

54. SP5 Paul W. Rice, 10 June 1965

LT Deigert and SP5 Rice were assigned to the 8th EOD Detachment at the time of their deaths. They had picked up a number of armed M2 and M6 mines and were transporting them to a disposal area. Enroute to the disposal area, the truck was driven down a steep incline resulting in the mines shifting in the rear of the truck. As the mines were all armed, it is believed that one of the mines detonated as a result of the shifting around and it in turn detonated the other mines in the back of the truck which was totally destroyed and both individuals were killed.

55. SP4 Jerry W. Corkern, 26 November 1966

SP4 Corkern was a member of the 133rd EOD Detachment at the time of his death. SP4 Corkern has the unfortunate distinction of being the first U.S. Army EOD technician killed in South Viet Nam. SP4 Corkern was killed and another EOD man was wounded when a VC stick grenade exploded while they were examining it.

56. SP6 Fred M. Kuddes JR, 27 January 1967

SP6 Kuddes was assisting with some experimental work at Dugway Proving Ground, Utah when he was killed. SP6 Kuddes was flying in a CH-21 helicopter from which barrels of CS were being dropped. One of the barrels still on the aircraft functioned setting the helicopter on fire and filling its interior with CS. The helicopter crashed and SP6 Kuddes was killed.

57. MSG Charles L. Robbins, 15 February 1967

MSG Robbins was assigned to the 85th EOD Detachment at the time of his death. MSG Robbins, SP5 Lynch, and two nonEOD volunteers were attempting to clear a mine field near Plieku, RVN when the accident occurred. A M16A1 mine detonated when MSG Robbins attempted to probe for it. The explosion killed MSG Robbins and severely wounded SP5 Lynch. The two volunteers received minor wounds.

58. SP6 Leon G. Nelson, 1 July 1967

SP6 Nelson was a member of the 3rd EOD Section at the time of his death. SP6 Nelson was one of the EOD men who were cleaning up the ASP at Duc Pho, RVN after it had several major explosions. SP6 Nelson placed a 40 MM grenade next to a 105MM HEP projectile. The 40MM grenade detonated and caused the HEP round to low order. The combined explosions killed SP6 Nelson.

59. SP6 Paul B. McKinley, 22 November 1967

60. SP5 Dean Moore, 22 November 1967

SP6 McKinley and SP5 Moore were members of the 191st EOD Section at the time of their deaths. SP6 McKinley and SP5 Moore were enroute to an incident near Phan Thiet, RVN when they were killed by a command detonated mine.

61. CPT George Fisher, 1 April 1968

CPT Fisher was a member of the 3rd EOD Section at the time of his death. CPT Fisher was killed when his room in the BOQ at Long Binh, RVN took a direct hit from a 122MM rocket which exploded next to his bed.

62. SGM Donald E. Calhoon, 10 April 1968

SGM Calhoon was a member of the 25th EOD Detachment at the time of his death. MSG Calhoon and SP4 Dick responded to an incident 13 km West of An Khe, RVN. SGM Calhoon was carrying a dud 105MM projectile from a road when three command detonated mines were fired and the VC opened fire with automatic weapons. SGM Calhoon was hit immediately by small arms fire and shrapnel from the mines. SP4 Dick ran to aid SGM Calhoon and after opening fire was hit in the jaw and right arm by small arms fire. The MPs who were at the incident rescued SGM Calhoon and SP4 Dick and called

for a MEDEVAC helicopter. SGM Calhoon died from his wounds before the helicopter arrived.

63. SFC Charles R. Baker, 15 June 1968

SFC Baker was a member of the 85th EOD Detachment at the time of his death. SFC Baker and SP4 Stanford were clearing the 4th Division grenade range at Camp Enari, RVN when one of the grenades exploded. SFC Baker was killed by the explosion and SP4 Stanford received over 200 fragmentation wounds and as a result was evacuated to the United States where he recovered from his wounds.

64. SP6 Lewis D. Black, 18 July 1968

SP6 Black was a member of the 184th EOD Section at the time of his death. At the time of his death, he was participating in the clean up of the Dong Ha ASP, RVN. SP6 Black was killed when a buried ICM projectile exploded.

65. MSG Donald E. Brosius, 19 July 1968

MSG Brosius was a member of the 25th EOD Detachment at the time of his death. MSG Brosius was killed when the truck he was riding in was involved in an accident near An Khe, RVN. MSG Brosius was returning to his unit after having completed an incident.

66. CPT Briggs K. Sicilia, 1 January 1969

CPT Sicilia was a member of the 170th EOD Detachment at the time of his death. CPT Sicilia was responding to an incident in Saigon, RVN when he was killed by an accidental gun shot.

67. SSG Jerry E. Kekel, SW 23 October 1969, DOW 29 November 1969

SSG Kekel was a member of the 42nd EOD Detachment at the time of his death. SSG Kekel was attempting to remove an M16 mine when a secondary device under the mine exploded. SSG Kekel was evacuated to Japan where he died from his wounds on 29 November 1969.

68. SSG Robert A. Whitted, 7 February 1970

SSG Whitted was a member of the 42nd EOD Detachment at the time of his death. SSG Whitted and SP5 Rankin were assigned as the on-site team at Lai Khe, RVN. They received a call that a booby-trapped drug cache had been located in the unit area belonging to the 173rd Helicopter Company. When they arrived in the unit area, they were directed to a personnel bunker where a handgrenade was located under a sandbag. SSG Whitted was attempting to remove the handgrenade after he had reached in and depressed the safety handle when the grenade exploded killing him and wounding SP5 Rankin. As SSG Whitted had succeeded in depressing the safety handle, the grenade should not have exploded. SSG Whitted's death was a tremendous waste as it had resulted from the actions of American personnel involved in the drug traffic in RVN.

69. SSG Rodney G. Johndro, 6 August 1970

SSG Johndro was a member of the 269th EOD Detachment at the time of his death. SSG Johndro was in the process of setting up a demo shot at LZ Hawk Hill, RVN when he was killed. Some 152MM propellant ignited while SSG Johndro was in the hole and there were several explosions which killed SSG Johndro.

70. SSG Louis Payne, 9 January 1971

SSG Payne was a member of the 184th EOD Section at the time of his death. The US/ARVN ASP in Qui Nhon, RVN had been blown up by the VC and EOD had been called in to clean up the UXOs. SSG Payne was killed when two 40MM grenades exploded when he attempted to move them.

71. MSG James E. Austin, 18 February 1971

MSG Austin was a member of the 44th EOD Section at the time of his death. The Des-Me Trans ASP, RVN had sustained a mass detonation and EOD had been called in to clean up the UXOs. MSG Austin was killed when a fuze 4.2 inch WP mortar exploded while he was carrying it to the holding area.

72. MSG Jackie W. Barnwell, 19 February 1971

MSG Barnwell was a member of the 44th EOD Detachment at the time of his death. VC sappers had gotten into

ASP 101 at Quang Tri, RVN and placed satchel charges among the ammunition stacks. Four satchel charges had been located and rendered safe by the EOD team and MSG Barnwell had located and was attempting to to render safe a fifth one. Unfortunately time ran out and MSG Barnwell was killed when the satchel charge that he was working on exploded.

73. CPT Gary J. Guest, 14 April 1971

CPT Guest was a member of the 87th EOD Detachment at the time of his death. CPT Guest was making IEDs that were to be used for training classes with the local police departments. CPT Guest was killed when a pipe bomb that he was assembling detonated.

74. CPT James W. Peterson, 22 May 1971
75. MSG Edward W. Metcalf, 22 May 1971

CPT Peterson and MSG Metcalf were members of the 44th EOD Detachment when they were killed. CPT Peterson and MSG Metcalf were killed in a vehicle accident enroute to their unit area.

76. SP5 Harry D. McWhinny, 25 October 1971

SP5 McWhinny was a member of the 170th EOD Detachment at the time of his death. SP5 McWhinny was killed while examining a handgrenade that had been turned into his unit in Saigon, RVN. The grenade exploded for unknown reasons killing SP5 McWhinny instantly.

77. SSG Roy Phillips, 12 March 1973
78. SP4 Daniel E. Helton, 12 March 1973

SSG Phillips and SP4 Helton were members of the 58th EOD Detachment when they were killed. They were setting up a demo shot on the FT Irwin, California demo range when it exploded killing both individuals and a civilian observer. As the unit had experienced problems with a sniper on the range, it is believed that the explosion was initiated by sniper fire.

79. SGM Kenneth R. Foster, 28 September 1976

SGM Foster was a member of the 63rd EOD Detachment at the time of his death. SGM Foster had been on a Secret Service detail when he was called away to an IED incident. A factory in Quincy, Illinois was the target of an individual who had placed several IEDs in

the factory the night before. During the night three of the IEDs detonated and early on the morning of the 28th, a fourth IED had been located. As SGM Foster and an Illinois State Fire Inspector were approaching the IED it detonated killing SGM Foster and severely injured the fire inspector,

80. SSG Christopher J. O'Reilly, 24 September 1977

SSG O'Reilly was a member of the 149th EOD Detachment at the time of his death. SSG O'Reilly, SSG Matthews, and SP4 Miller were working on the demo range when a large quantity of first fire mix prematurely ignited. SSG O'Reilly was severely burned and SP4 Miller received less severe burns. SSG O'Reilly died from his burns on 24 September 1977, which was three days after his initial injuries.

81. SSG Nancy A. Oszakewski, 29 July 1980

82. SP5 Ronald L. Kostenbader, 29 July 1980

83. SP4 Joseph J. Tripodi, 29 July 1980

SSG Oszakewski, SP5 Kostenbader, and SP4 Tripodi were members of the 70th Ord Det (EOD) at the time of their deaths. Five members of the 70th were in the process of loading approximately 1000 pounds of illegal fireworks on to a truck. For some reason, the fireworks on the truck suddenly started to burn. The three individuals who were killed ran into the open bunker for shelter from the flash fire. Unfortunately, the flash fire followed them into the bunker and initiated the fireworks that was still contained there in. The flash fire in the bunker killed the EOD personnel who had taken shelter there. The other two EOD personnel who had ran from the truck and bunker received minor flash burns and other injuries that were not critical.

NOTE: Three of the individuals contained in this list have not been approved for inclusion on the EOD Memorial at this time. Those individuals are listed below:

1. LT Rodger, June 1943
2. T/SGT Rapp, June 1943
3. 1LT Wyckoff, 18 July 1943

I. Bomb Disposal In Great Britain

Prior to World War II, the task of ordnance disposal was carried out in a very haphazard manner. Personnel with no or very little training in handling of ordnance were selected to destroy the assorted items of ordnance where they were found. As a result of using these untrained personnel, there were many deaths and injuries sustained over the years of warfare prior to World War II. With the advent of World War II, and the application of modern technology to ordnance, this task became inherently more hazardous.

The origin of modern day bomb disposal (BD) as we know it dates back to 1940 in Great Britain. Bomb disposal was born from necessity when the German Luftwaffe initiated bombing attacks against military targets in Great Britain. During the first few months of the war both the Germans and British were meticulous with their bombings to insure that civilians would not be killed. This was soon changed after one bombing raid during which the German Luftwaffe accidentally dropped their bombs on London. A retaliatory raid was made by the Royal Air Force (RAF) on a German city. In July of 1940, the Luftwaffe started their "Blitz Bombing" of the British population centers. The Italian Air Force joined in the bombing of England, however due to it's small size it didn't play a major role in the bombing campaign. All of the major cities and towns of England experienced massive bombings; some of which were up to 11 hours in duration. Thousands of bombs, rockets, mines and projectiles were dropped on Great Britain. Some of the ordnance items that didn't explode were duds. Many of the other items were either time delay or antidisturbance which were intended to function after the raid was over. Many people were killed and injured when they came out of the shelters. The time delay fuzing also gave the effect of around the clock bombing. The bombings and destruction that they produced were extremely demoralizing for the civilian populace (London experienced more than 500 civilian deaths in a single raid.), and they also impeded the British war effort by destroying the factories and shops that were producing the weapons and equipment required by the armed forces. The British government recognized the fact that they were going to have to deal with the unexploded ordnance (UXO) in a very expeditious manner. Born out of this need was bomb disposal as we know it today.

In the beginning, due to the excavation that was required, bomb disposal operations were carried out by the General Service Engineers of the British Army. These personnel received neither specialized training or equipment

for this assigned task. They used common excavation tools to locate the items of ordnance and they then used common hand tools and blind luck to attack the fuzes. Needless to say the life expectancy of these individuals was not very high. It soon became apparent that bomb disposal would call for a great deal of specialization to successfully deal with the threat of the unexploded bomb (UXB). Training and BD units were set up under the direction of the Royal Engineers (RE) of the British Army. For a brief period of time it was thought that bomb disposal should be a function of the Civilian Defense Force. This was found to be impractical for the following reasons:

1. Bomb disposal cannot be handled technically by civilians unless their entire time is devoted to it.
2. As a full time job it requires the discipline that is possible only in a military organization.

NOTE: The decision not to create a civil defense BD organization led to a similar decision during the formation of the BD organization within the U.S. Armed Forces.

Eventually an Auxiliary Bomb Disposal (ABD) organization was formed to assist the military BD units. The ABD volunteers were civilian workers in factories and other strategic targets who became members of the Home Guard. It was intended for these individuals to take care of any UXOs found at their work locations. This was later expanded to allow them to take care of UXOs located in the immediate area of their place of employment. A few of the ABD units became as proficient as their military counterparts. The remainder of the ABD units achieved varying degrees of success.

From May, 1940 through September, 1941 the first BD training was conducted for all three service branches at Melksham RAF Station, Wiltshire, England. The first Royal Engineer Bomb Disposal School was established in September, 1941 at Donnington, England. In January, 1942 the Royal Engineers opened their permanent BD school at Harper Barracks, Ripon, England. The task of establishing and operating the BD schools were far from enviable when the following basic problems were considered:

1. No centralized bomb disposal organization was in existence.
2. No training facilities existed.

3. No research facilities.
4. No organic supply system for the needs of the BD units.
5. Limited or no appreciation of the problems that existed.

Necessity forced the Royal Engineers to move forward at a very rapid pace. The BD school was organized and placed in operation in a very short period of time. BD officers and enlisted personnel were soon being sent to the field with very limited training and equipment. As could be expected this led to a very high casualty rate for the BD personnel. At the end of World War II, only a few of the original BD personnel were still alive. The quality of training improved as experience was gained by the BD personnel. The BD personnel were assisted by the appearance of some special tools such as the ones listed below:

1. Fuze Mirror - Used to identify fuzes and other markings without having to change the position of the bomb.
2. Clock Stopper (Electromagnet) - Used to stop the clockwork mechanism of mechanical time fuzes.
3. Thermo Fuze Discharger - Used to discharge capacitors in electrical fuzes.
4. Electronic Stethoscope - Used to listen for functioning clock mechanisms.
5. Remote Fuze Extractors - Used to extract fuzes remotely after the locking rings had been removed.
6. Acid Trepanner - Used to melt a hole in the bomb casing by dripping acid on the casing.
7. Steam Sterilizer - Steam was used to melt the explosives out of the casing when fuzes could not be rendered safe.
8. X-Ray Equipment - Used anytime that a new fuze was encountered or if it was suspected that an old fuze had been modified.

Even with the rapid advances in bomb disposal technology, there were always new problems which had to be evaluated and solved. Germany at the out break of World War II was

without doubt the most technologically advanced country in the world. Their technical ingenuity could be found through out their ordnance and weapons systems. As rapidly as the British BD technicians solved the problem of dealing with a fuze, the Germans either modified the design or fielded an entirely new fuze system. When the Germans realized how effectively the British BD personnel were dealing with the unexploded bombs, they started incorporating booby traps in their fuze designs to prevent render safe procedures (RSP) from being carried out. In the latter part of World War II, they designed some fuzes that would only function if a RSP was attempted.

The British BD units encountered problems when responding to UXO incidents that proved to be false or grossly misidentified ordnance. As a result, a Bomb Reconnaissance Course was established to train selected civilians, police and military personnel in the proper identification and evaluation of UXOs. This training was to greatly facilitate the proper use and efficiency of the British BD units.

British BD operations were based on the following operational chain:

1. Regional Commissioner (RC) - A member of the Civilian Defense Force, who had the final authority for categorization of BD incidents. As the final authority, he was the only person to whom the local officials could make an appeal for the upgrading of a category assigned to an incident in their area. This operation prevented the local officials from going over the head of the BD commander and getting all of the UXOs in their area designated as having a high priority for disposal.
2. Group Center (GC) - The GC was used for centralized reporting of UXOs. Initial categories of A-1 (highest priority), A-2, B, C or D (lowest priority) were assigned at the GC. By using the centralized reporting system, the high priority incidents were identified and accomplished first.
3. Bomb Reconnaissance Agents - Trained personnel who could properly evaluate UXOs and report their location to the GC.
4. Bomb Disposal Units - The BD units were tasked with the RSP, removal and disposal of UXOs.

Each branch of the British armed forces had their own BD school. In addition the Navy had a mine disposal school. The responsibilities for BD operations were initially established under the following guide lines:

1. All of the UXOs that were located in the cities, towns and surrounding country side would be rendered safe and disposed of by the Royal Engineer Bomb Disposal (REBD) units. The following two major exceptions existed during the early years of World War II:

- A. Sea Mines - The Germans attempted to mine the ports, rivers and canals by air dropping them. Most of the mines were gigantic in size and were delivered by parachute. In order to keep their fuzing systems secret, the mines were set to self destruct if they didn't land in water at the proper depth. When they were dropped on land, they would lay on or near the surface thanks to the parachute delivery system. When the self destruct fuzing system functioned, the lateral blast damage was tremendous. Both the public and German intelligence people were informed of how destructive these mines were by the British news media. This led to future use of these mines being dropped intentionally on land targets for the damage they produced. When these mine were located, the REBD unit would have to stand-by while Royal Navy BD officers rendered the fuze(s) safe. When the fuzes were safe, the REBD units would then transport and destroy the mines. This system was eventually dropped and the REBD units were trained and equiped to handle the mines.

NOTE: The same basic operational concept was employed by the U.S. Army BD units. Eventually this concept led to a number of Army BD personnel being killed. The deaths occurred during operations when there were no U.S. Navy BD or mine disposal (MD) personnel available. This lack of Navy personnel forced the untrained Army BD units to attempt the RSP and disposal of underwater ordnance for which they had not been trained.

B. RAF Bombs and Bomb Fuzes - In an effort to maintain secrecy, the RAF decided to keep the information concerning it's bombs and bomb fuzes secret from the rest of the British armed forces. When the RAF aircraft were forced to jettison or accidentally dropped their bombs on British soil, the REBD units had no idea in regards to how they should handle these bombs when they were located. If the UXB was identified as being British, the REBD units would have to stand by while a RAF bomb disposal unit responded and rendered safe the bomb fuzes. This problem was to persist until shortly before the invasion of Europe at which time they were trained and equipped to handle the British bombs.

2. All of the UXOs in the water or on the shore line would be RSPed by the Royal Navy Bomb Disposal (RNBD) units. A special land section was formed to handle sea mines dropped on land targets as previously mentioned in paragraph 1.A. on page 5 of this report. The RNBD units were assisted by Royal Navy Mine Disposal (RNMD) personnel in performing their assigned mission.

3. All UXOs that were located on RAF airfields or installations were RSPed by the Royal Air Force Bomb Disposal (RAFBD) units. As mentioned in paragraph B on this page, the RAFBD were also responsible for their own bombs which had been dropped on Great Britain.

NOTE: The concepts of responsibilities and operations that were established for the British BD units were basically copied by the U.S. Armed Forces. As the U.S. Air Force did not exist as a separate service branch during World War II, the mission assigned to the RAFBD units were carried out by U.S. Army BD squads that were assigned to the U.S. Army Air Corp. The majority of the U.S. Army BD squads initially performed the same mission as their REBD counterparts. This mission was to be greatly expanded when the U.S. Army BD units reached the battle fields of Europe and the Pacific. The U.S. Marine BD units also had a dual role which was due to their organic aviation units. The U.S. Navy BD units were to closely parallel their RNBD counterparts. With slight variations, the same guide lines set up for the British in

1940 are still followed by the Explosive Ordnance Disposal (EOD) units of the U.S. Armed Forces.

The Royal Engineer BD units were based on a company size unit. Each of the platoons in the BD company were capable of independent BD operations. Each of the BD companies were assigned to a specific area of operation. This created a basically static unit that lacked the capability to rapidly reinforce other BD units in a different area when they needed assistance. To compensate for this problem, mobile BD companies were eventually formed to provide assistance in areas where the assigned BD company was overloaded with BD work.

A major problem for the British BD organization was supply and services. It eventually became so severe that they were unable to operate efficiently. To compensate for this problem, they took over the responsibility for providing their own supply and services. They also created their own problems when they set up their research and development program. When they required the design of a tool or technical assistance, they went to many independent companies and research groups. There was no coordination or mutual assistance within this system. This was to result in many delays during the early years of World War II in the research and development area.

I have elaborated on the development of bomb disposal in Great Britain so that everyone might be able to grasp what a nightmare it was to set up and put into operation. We would have been faced with all the problems that they had encountered if we had had to set up our own independent program without assistance. They truly were the forefathers of EOD as we know it today.

II. Bomb Disposal In The United States

Bomb Disposal in the United States dates back to April of 1941. The United States was not yet at war, but we were actively preparing for that eventuality. Embassy personnel and military observers were reporting on the actions and the preparedness of the nations who were then involved with the war. When these reports were received by the War Department Intelligence Section, they were evaluated and recommendations were made in regards to what actions should be taken by the United States. One area that stood out was the havoc created by the air raids in Europe. The UXOs were taking a heavy toll in lives and industry. During this time it was expected that the United States would experience bombings of its cities and industries when and if we entered the war. As a result, the need for a bomb disposal program in this country received immediate attention.

In the beginning it was thought that bomb disposal would be a function under the Office of Civilian Defense (OCD). In April of 1941, the School of Civilian Defense was organized at the Chemical Warfare School, Edgewood Arsenal, Maryland. Part of the training to be conducted was bomb disposal. The Commandant of the Chemical Warfare School requested assistance from the War Department to set up the BD school. The request was approved and forwarded to GEN Julian S. Hatcher, who was the Commanding General of the Ordnance Training Center, Aberdeen Proving Grounds, Maryland. GEN Hatcher selected MAJ Thomas J. Kane to provide what ever assistance that was needed. As it turned out, the choice of MAJ Kane proved to be extremely advantageous in regards to the formation of the bomb disposal program in the United States Army. MAJ Kane formed a small staff of approximately ten officers and enlisted men which initially was to serve as the nucleus around which the BD program developed. Shortly after his selection for bomb disposal, MAJ Kane was promoted to Colonel. There are many individuals who contributed immensely to the early years of development of the BD program, but even these individuals and most everyone else give COL Kane the credit of having been the guiding force behind bomb disposal in the U.S. Army. With the help of an excellent staff, COL Kane was to carry bomb disposal from its inception to a finely honed organization.

The original courses in bomb disposal were based on extremely limited information and background. The only publications available were the existing Ordnance and Engineer Field Manuals and a few British publications. After having tried to get the BD program under the OCD in operation, it was soon found to be nearly impossible to do so. A report detailing these problems was forwarded to GEN Hatcher. GEN

Hatcher forwarded the report to the War Department which took no action until a second report stating the same information was received in September of 1941. The second report had been written by Mr. T.L.Gaines who was the Safety Engineer of the Land Security Division, Office of the Chief of Ordnance. The Chief of Ordnance put this problem before the Combined General Staff for a decision which was finally made in November of 1941. Two conclusions were reached;

1. The responsibility for bomb disposal on military bases and in the theaters of operation would be under the Ordnance Department.
2. The responsibility for bomb disposal in the United States would be under the OCD.

It was also decided that both the military and civilian BD personnel would be trained by the the U.S. Army. Through the efforts of COL Kane and based on a similar decision made by the British government (Section I, page 2), the initial decisions made by the General Staff were amended in December of 1941. All responsibility for bomb disposal was placed under the Ordnance Department. The OCD would be responsible for the disposal of incendiaries and bomb reconnaissance in the United States. It was also decided to change the location of the Bomb Disposal School from Edgewood Arsenal to the Ordnance Training Center, Aberdeen Proving Ground, Maryland. COL Kane was selected to be the school commandant.

In the interim period of time, the U.S. Navy under a directive from the Chief of Naval Operations (CNO) instituted a mine disposal school in May of 1941. The school was located in Washington, D.C., and it was to train U.S. Navy personnel in the disposal of U.S. and foreign mines and other underwater ordnance. In December of 1941, CNO issued another directive for the formation of U.S. Navy BD school.

The month of January, 1942 was a busy month for bomb disposal in the United States. The U.S. Army activated it's BD school at Aberdeen Proving Grounds, Maryland and the U.S. Navy activated it's BD school in Washington, D.C.. A fully equipped cadre of British BD instructors, headed by COL Geoffrey Yates, arrived at Aberdeen to assist in the instruction and operation of the Army BD school. The first Army BD classes to graduate were basically trained by this British staff. COL Kane, accompanied by a group of officers and NCOs, departed for England to observe British BD operations and to attend the REBD School. MAJ B.A. Saholsky was dispatched to the U.S. Navy BD School to observe their methods and organization. By sending MAJ Saholsky to the Navy BD School, a close and fruitful liaison was established which was to be maintained throughout the war.

NOTE: After the British staff completed its visit at the Army BD School, they went to the Navy BD School and assisted their efforts in BD training for a short period of time.

During COL Kane's absence, MAJ W.C. De Bill was appointed as the acting commander. The organization and training advanced very rapidly under the leadership of MAJ DeBill. The BD School was organized with the following sections:

1. Training Division
2. Publications and Relations
3. Supply and Transportation
4. Experimental Section (R&D)
5. Intelligence Section
6. Headquarters Detachment
7. Civilian Training Section (EOR)
8. Service Section

The BD School was initially divided into the following courses:

1. BD Officers Course
2. BD Enlisted Course
3. Reconnaissance Agents Course (EOR)

The first classes were taught using the existing British methods. Based on the long standing principle of teaching information on a need to know basis; only the officers were taught the render safe procedures for fuzes. The enlisted trainees were instructed in related support requirements such as excavation, bomb reconnaissance, recognition of ordnance, BD equipment maintenance, and basic demolition procedures. During this time frame, the British BD program was fairly narrow in scope because primarily they were only having to deal with German and British UXOs. It was very obvious that the United States was going to have to expand its program very rapidly because it was going to be dealing with all the ordnance of the countries that were engaged in World War II. By the end of World War II, the basic BD course was

expanded to seventeen weeks so that all of the ordnance could be covered. The Bomb Reconnaissance Course was given to selected civilian and military personnel to assist in the location and identification of UXOs. This was a very short course of instruction which did not require the extended training presented in the BD courses.

When the BD School was first organized at Aberdeen, it occupied what ever buildings and areas that were available. Initially when the school was first started this was not a problem. As the school grew at a very rapid pace, it soon became apparent that the school would require it's own training area. Construction and lay out was completed and the area occupied in June of 1942.

In March of 1942, COL Kane and party returned from England with a wealth of information. COL Kane resumed his duties as Commandant and LTC H.M. Walker, who had accompanied COL Kane to England, became the first Director of Training.

One of the first major problems that the BD School had initially, was a lack of training aids and material to work with. Examples of U.S. and British ordnance were relatively easy to obtain. The British were also able to provide a few German fuzes and ordnance. The film "UXB" was provided by the British and it proved to be an invaluable training aid. Some of the first BD officer graduates were given assignments to the various service commands around the world. In addition to their BD duties within the command that they were assigned to, they were also obtaining (in one way or another) samples of all the items of foreign ordnance found in the areas which they were assigned to and sending them back to the BD School. In a very short time the museum located at the BD School was soon filled with items of ordnance which could be used as training aids.

The school training areas were quite extensive in regards to the assorted training that was carried out. One area was used for training of the Reconnaissance Agents. It was used to teach proper reconnaissance and identification of UXOs. They also received training in how to handle small incendiary munitions and how to dispose of them. The remaining areas were used for BD training. To make it realistic, they even dropped bombs from aircraft in the areas where the students were trained in the techniques of excavation for UXOs. An extensive demolition area was set up to train the students in the handling of explosives and the proper techniques of disposal of UXOs.

When the first U.S. Army BD units were organized, they were based on a company sized unit similar to their British counterparts. The Table of Basic Allowances (TBA) No. 9, Ordnance Bomb Disposal Company (Provisional), was approved in May of 1942, with the first company being formed that same month. The TBA for personnel and equipment can be found in Appendix A. The BD company was a very large organization with many of it's personnel assigned to it in a support role. Due to it's large size, a great deal of mobility was lost. This relates back to the British BD units and the similar problems that they experienced in regards to mobility. A total of eight BD companies were eventually formed and deployed around world. A list of BD companies and their known assignments can be found in Appendix B. The 231st Ordnance BD Company was deployed to the Western Defence Command in May of 1942. As the first operational BD unit, the 231st deployed it's platoons (each of which were broken into two sections) on the west coast of the United States. One of the platoons belonging to the 231st had the distinction of rendering safe the first foreign UXB in the continental United States. The UXB was an incendiary bomb which had been dropped by a Japanese ballon. This incendiary bomb was the first of several hundred to be found in the United States. Approximately 10,000 of these ballon bombs were manufactured and launched from Japan. As these bombs relied on the wind and had no specific target other than the continental United States, they were considered more of a nuisance than a military threat. With the exception of one case in which five members of a family who were killed by a Japanese ballon bomb which they found while on a picnic, little strategic damage was ever caused by the ballon bombs. As stated, these were the first items of foreign ordnance encountered within the continental United States. Shortly after the Attack on Pearl Harbor, some items of Japanese ordnance were rendered safe by Navy and Army BD personnel who were assigned to the Pacific Service Command.

The BD company remained as the standard size unit until February of 1943. For the reasons of increased mobility and response time, the first BD squads were formed and deployed to the field. By May of 1944, all of the BD companies were inactivated and the assigned BD personnel were used to form BD squads. A total of 219 BD squads were formed under the TBA for a squad during World War II. The TBA for an Ordnance BD Squad Separate can be found in Appendix C. All members of the BD squad were school trained and and rated as BD technicians. All support required by the squad (mess, motor Maintenance etc.) would be provided by the larger Army units in their areas of operation. As previously mentioned, only the BD officers were trained in the actual render safe procedures. This would later create problems for the BD squads when they

were fragmented to work on more than one incident at a time. The BD squad commanders instituted their own training programs which enabled the enlisted members of their squads to carry out render safe procedures when he was not available. Shortly after the end of World War II, eight additional BD squads consisting of one officer and two enlisted men were formed for a special mission. The squads were designated as the 3651st through 3658th Ordnance BD Detachments. I have been unable to ascertain exactly what their special mission was. They were all activated in July of 1945 and inactivated in May of 1946.

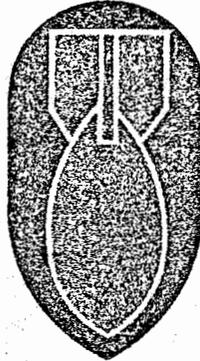
As the year 1942 progressed it proved to be a very busy one for the BD program in the Army. The BD School grew in size and its activities expanded to cover several areas which were to be in support of the BD units in the field. Procurement and distribution of equipment and supplies had been a major problem for the British BD program. To preclude the same problem from affecting the Army BD program, the BD School took over the management and distribution of the BD supplies and equipment. The BD School also served as an intelligence center for centralized collection and distribution of information concerning ordnance. This enabled the BD units to stay abreast of all the new ordnance and techniques as they were developed. The school also produced all of the training aids that were needed for its self and all of the units in the field. The R&D Section was continually producing new tools and techniques for use with the new items of ordnance being encountered in the field. First Lieutenant John Feldman, otherwise known as "The Inventor" was very instrumental in the development of many of the BD tools. Some of these tools are still in use today in modified versions.

In June of 1942, it was decided to give some of the recent BD School graduates a chance to test their skills with live UXBs which had been dropped from an aircraft. Two BD squads were formed for the test. One squad was led by CPT W.G. (Scotty) Calder and the other was led by CPT George Sarauw. The sites of two 100 pound bombs which had been dropped on the Proving Grounds bombing range were selected for the test. Both squads started their excavations at the same time under the observation of the BD School Training Officer, CPT (Pappy) Trevor. Each of the squads reached their bombs at the same time. After the enlisted squad members withdrew to the safe area, the BD officers started their RSPs. CPT Calder removed his fuze by using a hammer and chisel (At the time this was an accepted method of fuze removal.). He then walked over to CPT Sarauw's site and asked him how he was doing. After recovering his composure (CPT

Sarauw had been concentrating on the installation of an impact wrench); he informed CPT Calder, "that he was doing just fine and he would have the impact wrench installed shortly". Within a few minutes CPT Sarauw finished the installation of the impact wrench and removed the fuze remotely. It was decided to give both squads credit for UXB Number One.

The closing months of 1942 saw the formation of a number of new BD companies and their training for overseas duty. In September of 1942, the first BD insignia was authorized for wear on the uniforms of personnel who graduated from the BD school (figure 1, page 15). COL Kane was appointed as the first Director of Bomb Disposal and the BD School was reestablished as the Bomb Disposal Center. LTC Walker was then designated to take COL Kane's place as the Commandant of the BD School which was still maintained as a separate component of the BD Center. As the Director of BD, COL Kane was to oversee the development of bomb disposal in the U.S. Army. COL Kane remained in this position until March of 1944. In November of 1942, a distinguished unit crest was approved for the BD School (figure 2, page 16).

The BD Center was to operate through out World War II as the center of BD activity. It's efficient operation contributed immensely to the World War II BD operations. On 15 November 1945, the BD Center was inactivated and the BD School areas were transferred to the Ordnance Training School at Aberdeen.



· SHOULDER SLEEVE INSIGNIA ·
BOMB DISPOSAL SCHOOL

DESCRIPTION:

On a black projectile shape point downward $\frac{1}{16}$ inches wide by $2\frac{3}{4}$ inches long a red conventionalized drop bomb fimbriated in gold $\frac{1}{8}$ inch wide and $2\frac{3}{8}$ inches long.

O. Q. M. G. Oct 30 1942
Approved

Arthur C. Johnston
ARTHUR C. JOHNSTON
CHIEF, HERALDIC SECTION

Figure 1

rub copy
DEC 13 1942
A. B. O.

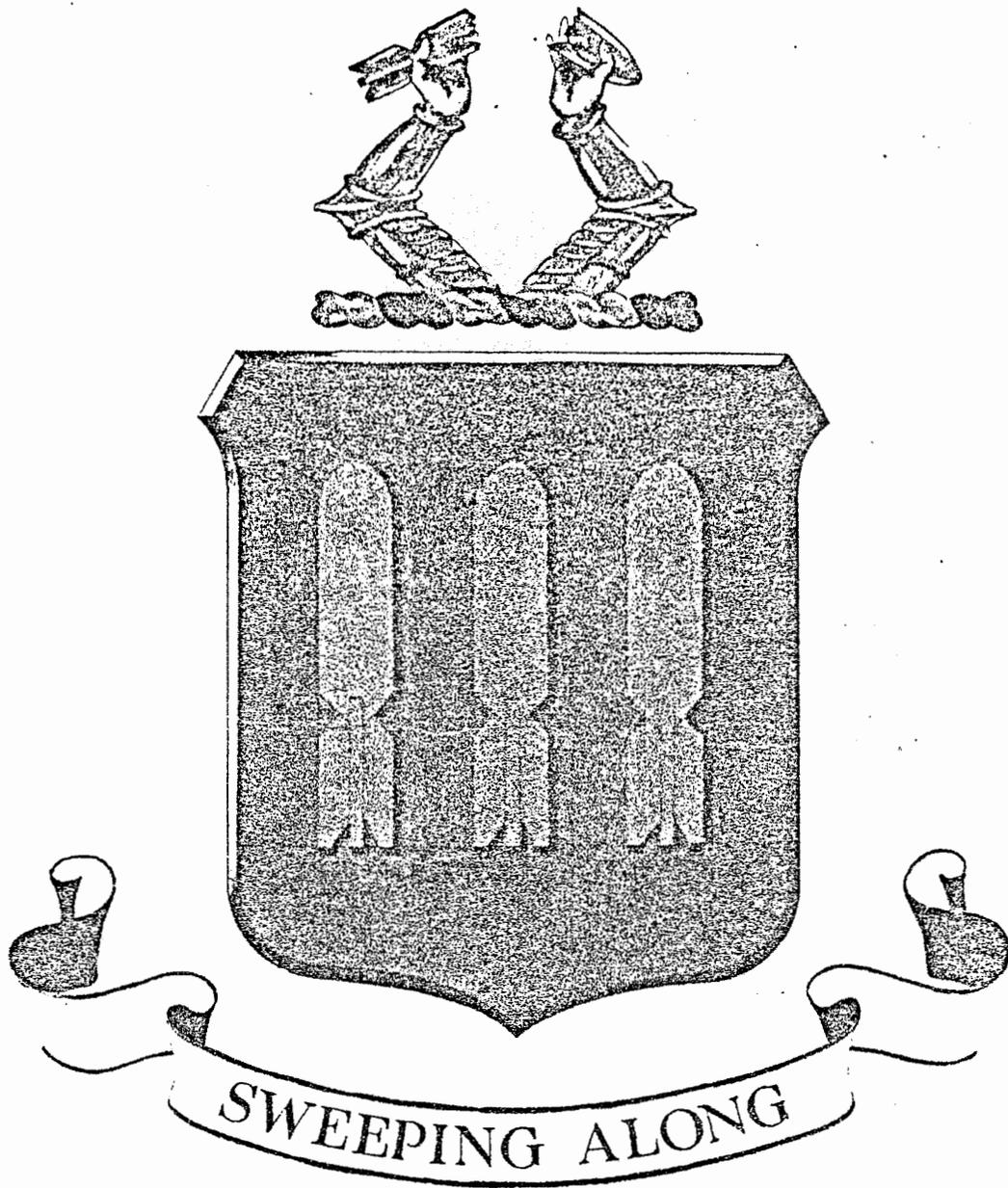


Figure 2

DEVICE FOR BOMB DISPOSAL SCHOOL,
ABERDEEN PROVING GROUND, MD.
APPROVED FOR Q.M.G.
NOV. 17, 1942

Arthur E. Dubois
ARTHUR E. DUBOIS,
CHIEF, HERALDIC SECTION.

III. Bomb Disposal In The European Theater Of Operations

The first Allied operation involving U.S. Army troops was in North Africa, in November of 1942. Initially the BD operations in this area were accomplished by British BD units. In January of 1943, the 235th and 236th Ord BD Companies arrived in North Africa to serve in support of the Allied Forces. The North African Campaign came to an end in May of 1943. The clean up operation for bomb disposal was to last for several more months.

In May of 1943, a Bomb Disposal Division was set up in England for the support of U.S. BD operations in Europe. The European BD Division was to prove to be invaluable for the support and liaison work that it was to carry out for the BD units in the field.

The Mediterranean operations commenced with the invasion of Sicily on 10 July 1943. The 235th and 236th Ord BD Companies and a few of the newly formed BD squads participated in the Sicilian Campaign. Although the Sicilian Campaign was of a short duration, there was a great deal of work for the BD units. The island of Sicily had experienced a tremendous aerial and Naval bombardment in preparation for the invasion. The island had also been heavily reinforced and supplied by Germany. There were many tons of both Allied and Axis ordnance that had to be disposed of. Less than ten percent of the BD work was to involve UXBs. The majority of the work dealt with other types of ordnance for which the units were inadequately trained to handle. This low percentage of UXBs was to hold true for the duration of the war in Europe. The U.S. BD training program was immediately expanded in scope to compensate for the then unexpected work load with other types of UXOs. There was one fatal exception to the training in the area of underwater ordnance. Due primarily to a shortage of U.S. Navy BD and MD personnel, the U.S. Army BD units experienced a number of casualties while working on sea mines and other types of underwater ordnance for which they had no training. This problem was to persist throughout World War II in both the European and Pacific Theaters.

In September of 1943, the Italian mainland was invaded by the Allies. The invasion of Salerno, Italy would be the first one in Europe during which U.S. Army BD personnel landed with the assault force. These units were to include elements of the 235th and 236th Ord BD Companies and several BD squads. The role of the BD units were slightly modified inasmuch as the units were now working with the lead elements of the combat units as they moved inland. The BD units were called upon to remove demolition charges, boobytraps, mines,

UXBs and other types of UXOs that were impeding the advance of the combat units. The BD personnel were often under continual observation and fire from the enemy while performing these tasks. On some occasions the BD units were able to blow the UXOs in place, however in most cases the items had to be RSPed and/or removed because the explosion of that item would hold up the advance or possibly cut the supply line.

In October of 1943, the 235th and 236th Ord BD Companies were inactivated and the assigned BD personnel were utilized to form the 131st through 153rd BD Squads (Separate). Most of these squads were to remain in Italy until March, 1945 when the Italian Campaign ended.

The 234th Ord BD Company arrived in England in October of 1943. The 234th was immediately tasked with the operation of the Bomb Reconnaissance School for U.S. and Allied troops. All of the BD squads which started arriving in England in December, 1943, reported to the 234th which served as a training and control section. While in England awaiting the anticipated invasion of France, the BD squads received additional training and worked with the British BD units scattered throughout England. After observing the U.S. BD squads in operation the British BD personnel were to adopt some of the U.S. BD tools and techniques for working on UXOs. One major difference between the British and U.S. BD units was in the amount of equipment that each considered it necessary to have in order to carry out the mission of bomb disposal. The British equipment was quite bulky and weighed several thousand pounds, whereas the U.S. BD equipment was streamlined and weighed only a few hundred pounds. The difference in equipment was a definite advantage in that the mobility and response time for the U.S. BD units was excellent. After working with the British BD units, some of the U.S. BD squads were soon allowed to work independent of their British counterparts on UXBs scattered throughout England. By allowing the U.S. BD squads to function in this manner, they were to gain invaluable hands on experience and several hundred UXOs were disposed of. The BD squads were also providing training for the troops arriving in England for the invasion of continental Europe. They gave classes in ordnance recognition, booby-trap precautions and explosive safety. Thanks to this training, many lives were saved who otherwise would have been killed needlessly.

In March of 1944, COL Kane arrived in England to assume the direction of the European BD Division. News of his arrival was well received by all of the U.S. Army BD personnel, as they knew that he could be relied upon to provide them with maximum support and he would look out for their welfare.

After evaluating the BD mission for the upcoming invasion, COL Kane decided that the 234th Ord BD Company would be utilized for the support of the BD squads participating in the invasion. This decision was brought about by the fear that the BD squads would not get the required support from the larger units operating in their areas. After the landings and initial commitment to operations, it was found that the BD squads were being adequately supported and the 234th would not be needed. Shortly there after the 234th was deactivated.

During the month of May, 1944, the units that were designated for the Normandy invasion, prepared their selves and their equipment for the operation. The BD squads who would land with the troops during the assault landings were issued one DUKW (amphibious cargo carrier) per squad.

During the preparations in England, the Allies were advancing in Italy. Several BD squads participated in the assault landing of Anzio, Italy. The work load in Italy had increased dramatically for the BD squads. The Germans were pouring in reinforcements and supplies to beef up the faltering Italian Army. Some of the Italian ordnance was so poorly made that it was considered hazardous when found in an unarmed condition. All of this added up to a sample of what it was going to be like for the BD squads when they landed in France.

In June of 1944, the largest sea invasion in history was launched against the coast of France. Commencing on 6 June, the initial assault forces landed on the beaches of Normandy. Due to the constant German bombardment of the beaches, the BD squads which landed with the first waves were not able to perform a great deal of BD work. This fact is exemplified by the events surrounding the D-Day landing of the 16th BD Squad. Using the squad's DUKW, LT Crow and S/SGT Henry departed for the beach under heavy German fire. Shortly after their departure, the LST (Landing Ship Tank) upon which the remaining members of the squad were still aboard, had it's bow door severely damaged which resulted in the LST having to withdraw from the beach area with the squad members still on board. On the 7th of June, the remainder of the squad and their equipment were loaded on a LCT (Landing Craft Tank) and later on that day they were finally landed on the beach. Shortly after landing on the beach, they were reunited with LT Crow and SGT Henry both of whom had spent a harrowing day and night on the beach. As a result of the enemy fire, the 16th BD Squad was not able to start effective BD operations until the 8th of June. Initially, the majority of the ordnance found on the beaches and inland approach routes was of Allied origin. As the squads moved inland from the beaches, the ordnance was to change to a mixed lot of Allied and Axis origins. Between

the 6th of June and the 24th of July, 1944, a total of 48 BD squads were landed on the beaches of Normandy.

When the combat units were able to finally move off the beaches, their routes of attack had to be cleared. This mission was assigned to several BD squads who on more than one occasion found their selves in the towns and villages ahead of the attacking forces. The BD squads were to take quite a few prisoners while clearing the towns and installations. Usually this was limited to one or two prisoners at a time, however on one occasion the 166th BD Squad captured twenty-five German soldiers at one time.

Commencing on the 15th of August, 1944, the Allies launched a second invasion in the area of Southern France. As with the other landings, this one was to include BD squads as part of the initial landing assault force.

The BD squads on the European fronts were soon disposing of vast quantities of ordnance every day. Some of the ordnance was inspected and salvaged for their own use (particularly demolition material) and for use by the Allied Forces. This operation was to be very hazardous inasmuch as the Germans boobytrapped or attempted to destroy their ammunition dumps during their retreats. A number of BD personnel were killed or severely injured while checking these ammunition dumps. With the vast quantities of ordnance that was being recovered daily, it was impossible for the BD squads to destroy all of it each day. Borrowing a technique from their British counterparts, the squads set up bomb cemeteries (holding areas) in which they stored the UXOs that had been collected by the squads. When time permitted, the squads would return and destroy all of the ordnance in the bomb cemetery. Eventually special BD disposal sections were formed to follow up on the BD squads and dispose of all the ordnance that had been collected.

The BD units were frequently used for missions that were inappropriate for a BD squad. The units were frequently called upon to clear mine fields which happens to be a mission for an engineer unit. On other occasions they were asked to inspect U.S. ammunition for serviceability. These and other misuses were usually corrected very quickly by either the BD commanders or COL Kane's European BD Division. From time to time the BD units were selected to participate in special operations. Some of these special operations have been selected for this report and are listed below:

1. T-Force - During combat operations in Europe, each of the major army commands had a section known

as T-Section or T-Force assigned to it. Each section was composed of BD personnel and intelligence agents. It should be noted that both the British and U.S. Army provided BD personnel for the T-Force sections. The T-Force sections were supposed to follow on the heels of the combat units as they cleared the cities and towns of enemy troops. As mentioned previously, the BD squads assigned to the T-Force were frequently in the towns ahead of the combat troops who were supposed to clear it for them. Once in the towns, the BD personnel were supposed to clear the buildings of booby traps or any other hazardous ordnance so that the remaining members of the T-Force could enter them safely. Once in the buildings, the intelligence personnel were to secure all documents pertaining to Gestapo or SS organizations. As the safes and storage containers were frequently boobytrapped or rigged for destruction they had to be cleared by the BD personnel. It was also felt that the BD squads had enough expertise with explosives that they could blow the safes open so that the intelligence personnel could have access to their contents. The records do not mention how successful the BD units were in these endeavors but the results must have been interesting.

2. Armored Vehicles - In December of 1944, the BD squads were tasked with the destruction of German armored vehicles. As the Germans made frequent attempts to recover disabled vehicles, it was deemed necessary to totally disable the armored vehicles and prevent them from falling back into the hands of the Germans for repair and reuse. Again based on explosive expertise, it was believed that the BD squads were best suited for this assignment.

3. Boobytraps - The Germans were experts in the area of boobytrapping. Many Allied soldiers were killed or injured by boobytraps left behind by the Germans. The BD squads served two functions in the area of boobytraps. The first responsibility was to educate the soldiers so that they would not fall victim to boobytraps. Secondly they had to clear the areas in which boobytraps were suspected to be located. Several BD personnel were severely injured by these fiendishly clever devices. The rule of thumb was to believe everything was boobytrapped until proven otherwise.

4. Bomb Disposal Assistance For Surgical Procedures - One unusual task for BD personnel during World War II was to involve casualties with items of live ordnance lodged in their bodies. On several occasions BD personnel were called upon to assist in the surgical removal of these items. The situation was rather unique inasmuch as the medical personnel were to receive high awards for valor and similar recognition, while the BD personnel received nothing.

5. Dam Operations - The Germans frequently attempted to destroy all of the dams as they retreated. By doing this it was hoped that the advance of the Allies would be halted or at least slowed down. The BD squads were called in to RSP and remove the demolition charges placed by the Germans on the vital areas of the dam. One of these missions involved the 16th and 17th BD Squads. CPT Crow (16th BD) and CPT Pilcher (17th BD) with three men from each squad were assigned to the assault on the Schwammanuel Dam. The BD personnel were attached to a combined infantry and engineer combat team for initial assault. During the assault CPT Crow was wounded by mortar fire and had to be evacuated. The remaining members of the BD squads continued the assault with the combat team. T/SGT Henry (16th BD) was driven back from the dam sluice gates by fire from an enemy strong point. He returned and with assistance he eliminated the strong point by destroying it and killing all the occupants. For their actions at the dam, CPT Crow received the Silver Star for Valor and a Purple Heart, and T/SGT Henry received the Bronze Star for Valor.

6. Bomb Disposal Training For Foreign Nationals - With the heavy work load that existed in regards to bomb disposal, it was deemed necessary to train selected civilians and military personnel in each of the occupied and liberated countries in the art of bomb disposal. In conjunction with COL Kane's European BD Division several schools were set up for this purpose. The training was conducted by qualified BD personnel and they were also provided with the necessary equipment to carry out the required BD work in the civilian areas. Many of the people who were selected had all ready received some training and had varying degrees of previous experience in handling of UXOs. The BD squads were to work very closely with these personnel and their

comradery was to forge a link of respect for each other that was near to impossible to break. When a member of any BD section was killed or injured, it was felt by one and all.

7. Special Investigations - Based on the concept that the BD personnel were experts in the area of ordnance, they were frequently called upon to investigate when ordnance was involved. If items of ordnance malfunctioned (fell short, premature detonation, excessive number of duds, etc.) the squads would send personnel to randomly inspect and evaluate the ordnance to ascertain why it was malfunctioning. The BD personnel were also called upon to evaluate new items of German ordnance and to inert these items so that they could be safely transported back to the U.S. One unusual assignment was to participate in an atrocity investigation. A unit of U.S. military personnel had been wiped out in such a manner that the personnel appeared to have been executed. When the bodies were first found, they were heavily boobytrapped. The first task assigned to the BD personnel was the removal of these items. After the boobytraps had been removed, the BD personnel were then asked to make an evaluation in regards to how the personnel were killed. Although it was not indicated in the unit records that this information was extracted from, it must have been a very trying and difficult task to carry out.

8. BD Support For Allied Army Commands - Several BD squads were assigned to the commands of other countries within the Allied Forces. As these countries had no organic BD units of their own, it was deemed necessary to assign U.S. BD squads to them for support. Due to the expected language and cultural problems, these assignments were initially accepted with a great deal of tribulation. As it was to turn out, the problems encountered were to be minimal and the BD squads were to carry out their assigned duties with little or no additional difficulties being brought on by this assignment.

9. Inerting Of War Souvenirs - In early 1945, the BD squads were ordered to start inerting war souvenirs for the GIs being rotated home. Although this was a dangerous and unpleasant task, it was necessitated by the fact that the GIs were sending or taking home items of live ordnance as war souvenirs. The BD personnel were forced to comply with

this decision as it had been made at the upper command level and they could not get it reversed.

The special missions that I have listed in this report were only a few of the many missions assigned to BD units that were in addition to their normal BD duties,

From January through April of 1945, the BD units were redesignated as Ordnance Service Detachments (BD). This brief loss of identity was rectified in April of 1945 when all of the BD units were again designated as Ordnance BD Squads.

The war in Europe came to an end in May of 1945. Post war BD operations were to continue for several years. A few of the European BD units were loaded on ships destined for the Pacific Theater of Operations. When they finally arrived, the war in the Pacific was in it's final days. Most of the BD units were then transshipped to the U.S. for inactivation of the units and discharge of the assigned personnel. Post World War II BD activities will be covered in Section V of this report.

IV. Bomb Disposal In The Pacific Theater Of Operations

The researchable information pertaining to BD activities in the Pacific Theater during World War II was extremely limited. The information contained in this section is based on the best available information.

In the early part of 1942 a number of U.S. Army BD officers were assigned to various commands in the Pacific Theater. They were the only BD personnel in the Pacific at that time. Their BD activities were very limited inasmuch as they were allowed to perform very little BD work at the time. They did teach many classes in subject areas such as Bomb Reconnaissance, Ordnance Demolition, and Booby Trap Precautions.

In September 1942, the 102nd Provisional BD Company was redesignated as the 232nd Ordnance BD Company and ordered to Hawaii. Upon arrival in October 1942, the 232nd was initially assigned to Fort Shafter. Shortly after arrival, the BD platoons were separated from the company headquarters platoon and assumed BD duties on various installations throughout the Hawaiian Islands. The 232nd was the first U.S. Army BD unit in the Pacific Theater of Operations. One of the first tasks assigned to the 232nd was the disposal of a warehouse full of improvised land mines. The Ordnance and Engineer personnel who had manufactured these mines refused to handle them due to the fact that their main charge was dynamite from which the nitroglycerin had separated. Until the 232nd was deactivated in November 1943, it conducted normal BD operations throughout the Hawaiian Islands.

In June 1943, the 5th Ordnance BD Squad participated in the assault landings on the island of Attu in the Aleutians. This gives the 5th BD Squad the distinction of being the first BD squad to participate in a combat operation and to land with a beach assault force. Unfortunately, the CO and T/SGT assigned to the 5th BD Squad were killed shortly after landing which gives them the misfortune of being the first BD personnel killed in World War II while carrying out their duties. The 5th BD Squad remained in the Aleutians until January 1944 at which time they returned to Aberdeen Proving Ground for additional training prior to redeploying to the European Theater. After arriving in Europe, the 5th BD Squad participated in the Salerno and Normandy Invasions. The 5th BD Squad was the only BD unit to participate actively in both combat theaters in World War II.

In December 1942, the 101st Provisional BD Company was redesignated as the 237th Ordnance BD Company. On 2 June 1943, the 237th was ordered to the Pacific Theater of Operations. The 237th deployed to New Caledonia where it was assigned to the First Island Command in July 1943. The headquarters platoon remained on New Caledonia while the BD platoons were assigned to various islands in the New Hebrides Chain. Up until the month of November 1943, the platoons carried out BD assignments throughout the islands. Eventually some of the BD platoons were working in the Solomon Islands (Guadal Canal, Florida Island) where they were supporting both the U.S. Army and the U.S. Marine Corps. They were also part of several of the island invasion task forces. They worked quite extensively with the Marines who were short of BD personnel at the time. In November 1943, the 237th and 232nd BD Companies were inactivated and the assigned BD personnel were used to form twenty BD squads.

As the war in the Pacific Theater progressed, the BD squads were very active and were constantly moving from island to island in support of combat operations. As previously mentioned the BD units in the Pacific Theater were supporting both the Army and Marine Corps. The main reason for the extensive Marine support by the U.S. Army BD squads was because the few BD personnel the Marine Corps did have were frequently landed as part of the first assault wave during which they were killed or wounded. The U.S. Army BD personnel were to experience assault landing casualties also as indicated on page IV, 22 thru 26.

During the combat operations in the Pacific Theater, through necessity, the BD squads were forced into operations that they would ordinarily not have performed. A major example of this would be the clearance of both land and sea mines. The sea mines and other items of Japanese and captured American under water ordnance were employed by the Japanese in two ways. The first of these involved the items which were encountered in the water and on the beaches where they had been used in their normal mode of operation by the Japanese Armed Forces. As these items represented a hazard and hindered operations, they had to be RSPed and disposed of. Like their Army BD counterparts operating in the European Theater (page 17), the Army BD personnel in the Pacific were forced to RSP and dispose of these items when there were no Navy BD or MD personnel available. As in Europe, several Army BD personnel were killed in the Pacific Theater while carrying out these operations. The second way in which these items were encountered was quite often many miles from the ocean and

beaches. The Japanese used any type of explosive ordnance that they could obtain as improvised mines and demolition charges. This resulted in sea mines, torpedoes, depth charges, and other items of underwater ordnance being found many miles inland with improvised fuzing systems. The Army Engineers who were trained to clear conventional mine fields were not qualified or equipped to RSP these improvised mines. To say the least, these improvised mines were extremely dangerous to RSP and dispose of. Starting on the beaches, the Japanese mined everything as they moved inland by combining conventional mines with the improvised mines. Due to the harsh tropical conditions, the mines deteriorated rapidly and became even more hazardous. This was due in part to the explosive fillers breaking down chemically (Picric Acid was used by the Japanese as a main charge explosive). The end result of all these problems relating to the Japanese mining techniques was the BD squads were to stay very busy handling incidents involving the improvised mines and demolition charges.

Starting in the later part of 1943, the BD squads were tasked with checking captured Japanese ordnance and weapons for booby traps and serviceability. The ammunition and weapons that were judged to be serviceable were then shipped to China for use by the Chinese Armed Forces against the Japanese.

The BD squads were shifted from island to island at a very rapid pace in late 1943 and early 1944. The squads would spend a few days or weeks clearing the islands of UXOs that were of immediate concern and then move on to the next island invasion. As the war progressed and more squads were available in the Pacific Theater, the BD squads were able to spend more time on each island doing a more thorough clean up of all the UXOs that could be located. Eventually, the BD squads were able to return to the islands that had been liberated previously and complete the clean ups that they had started prior to being shifted to another island. As time allowed, the BD squads also trained local indigenous personnel in the techniques of bomb disposal.

Some of the BD squads were to have some unusual experiences in the Pacific Theater. The 109th BD Squad was assigned to the 11th Air Borne Division. Members of the 109th were frequently required to work in front of the division lines. At one time, the squad members were required to lead tanks up to Japanese pill boxes so they could be knocked out by direct tank fire. They were also required to clear caves which were frequently still

occupied by uncooperative Japanese soldiers. On one occasion, a sergeant assigned to the 109th was lost behind enemy lines for two weeks and had been declared missing in action. As a result of all these activities and the misuse of the 109th, the squad had a very high casualty rate. All of these problems could have been precluded or minimized if there had been a Bomb Disposal Division in the Pacific Theater similar to the one which was operating in the European Theater (pages 17 thru 20). Eventually the problems experienced by the 109th were rectified when the squad commander had a meeting with the 11th Air Borne's commander.

The 212th BD Squad was assigned to the Hawaiian Islands; where illogical as it might seem, the squad members had to teach their selves how to dive so they could work on both Army and Navy ordnance under water. With the thousands of Navy personnel who were assigned to Hawaii it was still necessary for the Army BD personnel to carry out this mission.

The commander of the 183rd BD Squad participated in the surgical removal of a 20mm HE projectile from a GI on the island of Cebu in the Philippines. This type of operation was to be repeated many times in both theaters of WW II and in later wars.

The 103rd BD Squad was assigned to the island of Luzon in the Philippines in July of 1945. The squad commander and three of his men were tasked with clearing the town of Echague of UXBs. During a two day period in July 1945, they RSPed and disposed of 450 assorted (23 pound to 1000 pound) Japanese and American bombs that were located in a one square mile area. This is quite an accomplishment for four personnel working alone.

Air power played a major role in WW II and as a result, the islands with airfields were very high on the list for assault by the Army and Marine Corps. After capture it was very important that the airfields be operational as soon as possible. The Japanese frequently mined the runways by burying bombs as improvised mines. The BD squads had to do a great deal of digging to remove all of these bombs and other demolition charges that were located on and around the airfields.

When the war in the Pacific ended, the squads were rapidly broken up and the personnel were sent home. They were eventually replaced and the clean up operations in the Pacific would go on for many years.

V. Post World War II BD/EOD Activities

With the close of WW II in the European and Pacific Theaters, there was to be little change in the activities of the BD squads in those areas. The only difference was in the fact that they were not performing their duties under combat conditions. The individual squads were literally dealing with tons of ordnance each day. In addition to RSPing and disposing of UXOs, they were collecting large quantities of ordnance from both German and Allied sources. The ordnance that they were collecting had to be checked for serviceability or destruction. Many large munition plants and ordnance storage areas in Germany and the occupied countries had to be cleaned out as they were in a very poor state after having been bombed and shelled by the Allied Forces.

When the U.S. Army BD personnel encountered their first German civilians, they were treated with a great deal of hostility. This was due in part to a misconception by the German civilians in regards to just who the BD personnel really were. When the Germans first saw the red bomb insignia sewn on their uniforms, they thought that they were bombardiers and were responsible for the bombing of their homes. When the Germans found out who the BD personnel really were, their attitudes experienced a complete turn around when the BD personnel started collecting the many UXOs that were located in and around their homes.

There were many underground installations through out Germany that needed to be checked out by the BD squads. In some cases, entire airfields, factories, and storage areas were situated below ground. As previously mentioned, the Germans were supreme when it came to mining and booby trapping. As the war was coming to its end, the Germans practiced this hellish technique as they retreated by heavily booby trapping the installations mentioned above. After several attempts at clearing some of these underground installations, it was decided that the tremendous danger involved exceeded the necessity of having to clean out the installations. Rather than risk the lives of the BD personnel, the installations were sealed shut and if possible they were also flooded with water. Periodically since the end of WW II, some of these installations have been opened by U.S. Army and German EOD personnel in an attempt to clean them out. Unfortunately, little success has been achieved, and in some cases the attempts have been disastrous.

Towards the end of WW II, the Germans secreted many ammunition and weapons caches for use in the event that they lost the war. Fortunately, the specially trained soldiers and Hitler Youth members who were supposed to carry out guerilla warfare did not do so. All of these caches had to be cleaned out by the BD squads. They were frequently booby trapped and not all of them were located. Periodically during recent years, some of these caches have been located and cleaned out by EOD.

Shortly after the end of the war, the BD units were required to inspect tons of U.S. equipment and material that was being returned to the United States. All of the items had to be inspected to insure that there were no explosive items in them.

Up until the end of WW II, very little was known about our German and Japanese BD counterparts. It was known that the German BD technicians were very proficient at rendering safe Allied bombs that had been dropped on German targets. Unlike the British and other Allied countries, the Germans had a trained BD organization prior to the first bombing raids on Germany or the occupied countries. This was evidenced during the first British bombing raids against strategic German installations. In an attempt to preclude the unnecessary death of civilian workers, the British bombs were fuzed with delay fuzing which would allow the workers time to get out of the factories. Special German BD sections assigned to the strategic target areas were able to RSP the bomb fuzes before they could explode. When the British made reconnaissance flights to assess the damage from their bombing raids, they were very surprised to see that none or very few of their bombs had exploded. The German BD sections were led by very highly trained officers. The NCOs and other EM assigned to the BD sections received basic demolition training and a little support type BD training. The German BD officers were very secretive in their work and unlike their American and British counterparts, they shared very little of their knowledge with their men. The German BD equipment was kept under lock and key, and was heavily guarded when being transported to BD incidents. In the later years of WW II, a few selected German civilians were trained as BD technicians and became very proficient at RSPing American and British bomb fuzes. There was one exception to the above statement, which were the American and British anti-withdrawl fuzes. The tools and techniques for dealing with these fuzes were kept secret and only German BD officers were allowed to work on them. These German army and civilian BD personnel were to form the nucleus of the post WW II German BD organization

known as "Speng Kommandos". Initially, the Spreng Kommando sections were led by a U.S. Army BD technician who was designated as the "Spreng Leitner". Eventually the Spreng Kommando sections were operating independently under their own leadership. During the ensuing years since the end of WW II, the Spreng Kommandos have been very busy locating and destroying UXOs scattered throughout Germany.

There is not a great deal to be covered in regards to Japanese BD activities during WW II. In the beginning of WW II, the Japanese thought that they would never be bombed and as a result, a BD organization was never created. When in fact they were heavily bombed, they allowed untrained volunteers to attempt the removal of the fuzes, or they just left the bombs lay where they had come to rest. Towards the end of WW II when the Japanese experienced a shortage of explosives, they were recovering the unexploded bombs and mines dropped on their cities and harbors so that they could use the explosive fillers in their own ordnance. This operation was carried out with out the benefit of special BD tools or training.

On 15 November 1945, the U.S. Army BD Center at Aberdeen Proving Ground was deactivated. All of the training activities, facilities, BD personnel, and equipment were transferred to the Ordnance School, where the BD Branch was created as part of the Academic Training Division. At the same time, the BD Museum was merged with the Ammunition Branch Museum at Aberdeen. Three BD squads were also permanently assigned to the Ordnance School for its support.

As a result of the in mass discharge of BD personnel and the post war demobilization of the U.S. Army, nearly all of the BD squads were inactivated by the end of 1945. During the early months of 1946, many of the BD squads were reactivated for the world wide clean up of the battle fields.

In the early part of 1946, a BD team consisting of CPT Guy Quick and three enlisted BD personnel was assigned to the task force responsible for the Bikini Island Atomic Weapons Test. This marked the first BD/EOD involvement with nuclear weapons.

On 12 April 1946, the BD Branch became part of the Ammunition Branch at Aberdeen Proving Ground. From this point in time up to the Korean War, there was very little change in the BD community at Aberdeen.

An Army BD School was opened at Hilpoltstein, Germany on 1 May 1946. The Hilpoltstein BD School was staffed by instructors from the Ammunition Branch from Aberdeen. This school was instituted as a result of the fact that the newly reactivated BD squads in Europe had been organized with untrained personnel assigned to them. As a result of this lack of trained personnel, the squads were incapable of carrying out BD operations. The first group to be trained at the Hilpoltstein BD School were all of the personnel assigned to the 72nd thru 75th, 82nd thru 85th, and the 87th BD Squads. The BD course of instruction at Hilpoltstein was forty five days in length. Shortly after the first class graduated, U.S. Army BD activities in Europe were again in full operation.

In addition to the BD squads operating in the European and Pacific areas, individual BD technicians were assigned to various ammunition units and service commands. These BD technicians either carried out BD operations alone or with the assistance of untrained personnel.

In the years 1946 and 1947, thirty to forty USAR BD squads were activated. These squads initially were activated with untrained personnel assigned to them. The personnel assigned to these USAR BD squads received their BD training during their summer camp or brief call ups to active duty for training. The USAR squads were used very little until the out break of the Korean War.

Many of the units which had been reactivated for the clean up of ordnance in the European and Pacific areas were again inactivated between the years 1947 thru 1949.

In December 1949, all of the USA and USAR BD squads were redesignated as Explosive Ordnance Disposal (EOD) squads.

VI. Explosive Ordnance Disposal In The Korean War

On 25 June 1950, the North Koreans invaded South Korea. Within a few days of the invasion, the first U.S. troops arrived in South Korea. The 98th EOD Squad arrived in Korea twenty days after the war broke out. The 98th had been assigned to Japan which made it the closest EOD unit that could be immediately deployed to Korea. As the first EOD unit in Korea they arrived at a time when the situation was most critical. The North Koreans had very nearly captured all of South Korea and were pushing the UN Forces farther southward to the Sea of Japan. Seven days after the 98th arrived, they were joined by the 19th EOD Squad. Due to the very fluid battle lines, the EOD squads were frequently under fire and required to defend their selves in combat. Eventually, these two squads were joined by twelve other EOD squads which gives us a total of fourteen EOD squads who served with distinction and honor in the Korean War.

In the mean time, the EOD School at Aberdeen immediately expanded and accelerated its training to meet the requirements imposed on the EOD organization as a result of the Korean War. Eventually (1951-52), the Army EOD training was expanded to Raritan Arsenal, New Jersey. At Raritan Arsenal, EOD squads were activated and equipped, and received additional training as EOD Squads. From Raritan Arsenal, the squads were shipped to Korea or wherever they were needed around the world. As the regular Army EOD squads assigned to U.S. installations were shipped overseas, USAR EOD squads were called to active duty to fill this void that had been created on the state side installations.

During the first three months of the Korean War, the UN and South Korean Forces were continually pushed southward to what became known as the Pusan Perimeter. During the retreat to Pusan, the EOD squads were very busy destroying ammunition and equipment that had to be left behind. Starting in September 1950, the situation for the UN Forces improved tremendously and they were able to advance northward. Personnel from the EOD squads accompanied reconnaissance patrols and the advance elements of the ground forces as they moved to the North. The EOD personnel were required because the terrain through which they were advancing was literally covered with a vast assortment of UXOs.

The EOD units in the Korean War were to perform special assignments as their predecessors had done during WW II. Some of these assignments will be covered in the following paragraphs:

1. Sabotage Training - The 4th EOD Squad was tasked with providing sabotage training to South Korean soldiers. These soldiers were then sent on special missions in North Korea.
2. Inerting Ordnance - The various EOD squads were required to inert many items of UN and communist ordnance. Some of these items were placed on display boards which were used for the training of UN soldiers. A great deal of the captured ordnance was inerted for intelligence purposes.
3. Training Korean EOD Personnel - The U.S. Army EOD squads were required to train the personnel from the Republic of Korea (ROK). This training was usually accomplished by assigning a ROK EOD squad to a U.S. EOD squad. In addition to formalized training, the ROK EOD squads received informal training by observing and working with the U.S. squads on actual EOD assignments.
4. Surgical Procedures - As in WW II, EOD was again called on to assist surgeons while they operated to remove items of live ordnance from a patient.

In 1951, through interservice conferences, it was decided that the Department of Navy would take over the responsibility for all EOD training as soon as possible. In addition to training it was also decided that the Navy would be responsible for the development of EOD tools, techniques, and publications. Total implementation was to require several years before the Navy completed this task. The Navy EOD School was to provide two levels of training which was to be a Basic EOD Course and an EOD Supervisors Course. Each of the services were required to provide instructor personnel for the school. In accordance with this requirement, a number of instructors were sent from the Army EOD School at Aberdeen to the Navy EOD School at Indian Head, Maryland. In the later part of 1951, the first U.S. Army students arrived at Indian Head for training. EOD training also continued at Aberdeen until 1956.

January of 1951 was a tumultuous month for the UN Forces in Korea. On the 4th of January, the communist forces had occupied Seoul, South Korea for the second time in the war. As the UN Forces continued to withdraw southward they again destroyed a great deal of the material which they were forced to leave behind. In March of 1951, the retreating UN Forces blew up the Ascom City ASP which

at the time was one of the largest in South Korea. After it was recaptured, it took the 4th and 19th EOD Squads forty eight days to clean up the ASP.

During the second year of the Korean War, a critical shortage of trained EOD technicians developed. As a result, EOD officers were meeting new troops as they arrived in Korea and inquiring if any of them had any kind of an ordnance background. If they did, they were given a two week in country EOD course and then sent out to EOD units in the field. As can be expected, these individuals had a high casualty rate which was due in part to their limited EOD training and experience.

As in WW II, when Navy EOD personnel were not available, Army EOD technicians were again called upon to RSP and dispose of items of underwater ordnance. For the most part, the items of underwater ordnance were Russian sea mine that were encountered in the harbors and along the coast of Korea. Unlike WW II, as far as I have been able to determine, no Army EOD personnel were killed or injured while working on underwater ordnance items in Korea. When it was possible, the Russian sea mines were saved and used for demolition material.

At times during the Korean War, the EOD squads were required to work behind the communist lines. As previously mentioned, they frequently accompanied recon units. They also performed as saboteurs when the requirement for experts in demolition were called for. An example of this would be the mission carried out by the 22nd EOD Squad in December of 1951. A secret communist ammunition dump had been located behind their lines. Members of the 22nd accompanied an infantry platoon behind the communist lines and destroyed the ammunition dump by placing demolition charges in the dump area. This was quite a novelty for the EOD personnel inasmuch as they normally were cleaning up UN ammunition dumps that had been blown up by North Korean saboteurs.

Very little information is available in regards to EOD activities in Korea during the years 1952 and 1953. During the peace negotiations, and the various cease fires during this time frame; the EOD squads in Korea carried out their normal disposal duties. EOD personnel were also assigned to the truce teams patrolling the areas between the UN and communist forces. On 27 July 1953, a cease fire was fully negotiated and put into effect. A major EOD clean up was to go on for many months after the cease fire. To this very day, varying quantities of UXOs are still being located and disposed of by U.S. Army and ROK EOD units.

VII. Post Korean War EOD Activities

Again, as at the end of WW II, the U.S. Army experienced a reduction in force at the end of the Korean War. This included EOD, however it was not at the same scale as previously experienced when bomb disposal nearly ceased to exist. It had been finally recognized that EOD was needed in both peace and war time. Many new EOD squads were eventually formed and assigned to installations in the United States and overseas.

With the end of the Korean War, all of the USAR EOD squads were returned to reserve status. With one exception, the USAR EOD squads were to be used very sparingly in the proceeding years. By the end of the late 1960s, all of the USAR squads were deactivated.

In 1954, the EOD squads were redesignated as Ordnance Detachments (EOD). In November 1954, the Ordnance Explosive Disposal Office was established at Aberdeen Proving Ground. This office was created to assist the Chief of Ordnance in regards to the responsibilities of EOD as a part of the U.S. Army Ordnance Corps.

In July 1956, the EOD Section of the Ordnance School was expanded to include a Demolition Section. The Demolition Section was created to provide demolition training to all members of the Ordnance Corps who required that type of training while at Aberdeen.

On 1 October 1956, the enlisted portion of the EOD School was closed down and from that date forward, all of the enlisted personnel were sent to the Navy EOD School at Indian Head. Limited EOD officer training continued for a brief period of time at Aberdeen.

On 31 July 1957, the EOD Specialist and the EOD Supervisor Badges were approved for wear. COL Kane and Guy Quick were among the designers of the new EOD badges.

On 23 September 1957, the Army Liaison Office (ALO) Detachment at Indian Head was established as a branch of the Ordnance Supply Training Division of the Ordnance School, Aberdeen Proving Ground, Maryland. This action created two EOD elements for the U.S. Army Ordnance School; the Technical Ammunition Branch (EOD Section) at Aberdeen, and the EOD Branch (ALO Detachment) at Indian Head.

In 1959, the EOD units were redesignated as Ordnance Detachments (ED).

In 1964, the EOD Section of the Ordnance School was redesignated as the EOD Division under the Director of Instruction.

On 24 April 1965, the Dominican Republic became embroiled in a civil war. The 864th Ordnance Detachment (ED), USAR, was called to active duty and arrived in the Dominican Republic on 29 April 1965. While in the Dominican Republic, the 864th provided EOD support for the 20,000 member U.S. Army peace keeping force. After several weeks of duty, the 864th returned to the U.S. and reverted back to its reserve status. The 864th was again called to active duty and returned to the Dominican Republic on 24 August 1966. After carrying out EOD duties for several weeks, they again returned to the U.S. and reserve status. The 864th was the last USAR EOD unit to be called up for a major role in a U.S. Army operation. Shortly after the last call up for the 864th, all of the USAR EOD units were deactivated.

On 1 October 1965, the EOD Division at Aberdeen was inactivated and the EOD Training Detachment (ALO) at Indian Head was transferred as a subelement of the U.S. Army Ordnance Guided Missile School, Red Stone Arsenal, Alabama. With this final dissolution of EOD activities, twenty three years of BD/EOD activities at Aberdeen Proving Ground came to an end.

VIII. EOD In The Viet Nam War

The war in Viet Nam cannot be compared with any of the other major conflicts in recent history. The normal concepts of how to conduct a war had to be either modified drastically or totally abandoned. There were no front lines or rear areas. The enemy was not easily identified and might turn out to be a woman or child approaching you with an innocent smile on their face and a hand grenade in their shirt. The mission for EOD was to be the same as it had been in WW II and Korea; only the means and ways of carrying out their mission had to be modified at times.

The first EOD units arrived in late 1965. The 533rd Ordnance Detachment (EDC) arrived on 15 September 1965. The 533rd served as the Control Detachment for all of the EOD detachments in RVN. The 533rd was the last EOD unit to leave RVN, which it did on 22 March 1973. In addition to the 533rd, the following EOD detachments and sections served in RVN:

1. 25th Ordnance Detachment
2. 42nd " "
3. 44th " "
4. 59th " "
5. 85th " "
6. 99th " "
7. 133rd " "
8. 170th " "
9. 269th " "
10. 287th " "
11. 3rd Ordnance Battalion EOD Section
12. 184th " " " "
13. 191st " " " "
14. 336th " " " "

The first major build ups of U.S. Forces in RVN occurred in 1965 and 1966. As the total U.S. Forces increased; so did the EOD mission. To facilitate a more efficient EOD operation, the On-Site Team concept was instituted. The On-Site Teams consisted of two or three EOD technicians who were located at forward base camps scattered throughout Viet Nam. By using this concept, the incident response time was reduced and a more direct liaison between the EOD teams and the units they were supporting was established. The personnel for the On-Site Teams were drawn from the EOD units in Viet Nam. The teams were established as being either a temporary or permanent On-Site Team. At times during the Viet Nam War, more than twenty On-Site Teams were in operation.

The four Ammunition Battalion EOD Sections were initially conceived to support the ammunition battalions which they were a part of. In reality, they functioned as a regular EOD unit inasmuch as they responded to incidents in their areas of operation and they also provided personnel for the On-Site Teams.

In addition to the EOD personnel who were assigned to the EOD detachments and sections, there were other EOD personnel assigned to various EOD positions in Viet Nam. Some of these EOD technicians were assigned to ARVN EOD units as advisors where they provided guidance and support. A few of the EOD technicians were assigned to the EOD Office MACV and to the Material Exploitation Center (MEC). The MEC served as a centralized intelligence gathering center and the EOD personnel assigned to it utilized their ordnance background to evaluate captured enemy ordnance. They also inerted many of these items so they could be used as training aids.

In 1966, there was a major build up of U.S. Forces in Thailand. To support this build up, the 98th Ordnance Detachment (ED) was assigned to Thailand on 18 March 1966. The 98th remained in Thailand until 21 February 1971.

The first major EOD incident occurred on 25 April 1966, when the Qui Nhon ASP was penetrated by VC sappers. After the explosions which resulted from this sapper attack, it took the EOD people three days to clean up UXOs scattered throughout the ASP. Although it was nothing like some of the future ASP clean ups, it did give the EOD personnel a foretaste of what they had to look forward to. Some of the ASPs would require months to clean up; with many thousands of EOD manhours being expended in the process. Unfortunately, many EOD personnel were killed and wounded while cleaning up these ASPs. This was not solely an Army problem as the other services experienced similar problems in their ASPs and bomb dumps. Within a short period of time, the ASP clean ups were to become multiservice and even multinational EOD operations. In addition to U.S. EOD personnel, there were EOD personnel from Viet Nam, Philippines, Australia, Korea, and New Zealand participating in EOD operations throughout South Viet Nam. The ASP clean ups were often performed under the most trying conditions. At times the temperatures would be over 135 degrees or it would be pouring down rain during the Monsoon Season. As it was very critical to the war effort to have the ASPs back in to operation as soon as possible, EOD personnel would often be working in the ASPs while they were still burning and/or exploding. More than one ASP was saved from total destruction

through the efforts of EOD personnel. On several occasions, EOD personnel were able to enter the ASPs and remove the satchel charges placed by the VC before they could explode. Not only were the ASP clean ups time consuming, they were also frustrating as many of them were blown up repeatedly.

Any base or installation was subject to attack in Viet Nam. Some of them received special attention such as the airfields. With their lengthy perimeters, the airfields were easily penetrated by ground assault or small groups of VC infiltrators. Once on the airfield, the VC would place explosive charges on the aircraft, maintenance areas, and other support facilities. The POL tank farms and storage areas with their related pipelines were often a favored target of the VC. More than one EOD technician has had the harrowing experience of pulling explosive charges off of fuel tanks in a burning tank farm. The EOD technicians also had to clear the pipeline systems which were frequently mined and booby trapped by the VC. Almost every installation, large and small, was to endure numerous and sometimes prolonged mortar and rocket attacks. When the attacks ended or let up to some degree, the EOD teams would be called in to clean up the UXOs.

In 1966 and from there on, EOD was called upon to perform fragmentation analyses on almost a daily basis. The EOD technician would check the site of an explosion to determine what type of munition had exploded. Not only did this involve enemy items, it also included items of U.S. ordnance which had inadvertently landed in friendly areas.

On the 26th of November 1966, SP4 Jerry W. Corkern was killed while examining a VC stick grenade which exploded in his hands. SP4 Corkern was the first U.S. Army EOD technician killed in the Viet Nam War. Before the war in Viet Nam ended, a total of twenty one U.S. Army EOD technicians would lose their lives. Many times that number were wounded or injured while serving in Viet Nam. During my review of the unit records from WW II, the Korean War, and the war in Viet Nam; I noticed that there were many more Purple Hearts awarded to EOD technicians in Viet Nam than in WW II or the Korean War. This large number of Purple Hearts correlates to the type of unconventional warfare that was fought in South Viet Nam. The EOD casualties in Viet Nam were from many varied sources such as helicopter crashes, inerting ordnance, mines, booby traps, ambushes, rocket & mortar attacks, ground combat, exploding UXOs, and vehicle accidents.

The VC/NVA were masters at improvisation in regards to weapons and munitions. They literally used trash that had been discarded by the U.S. Forces and made weapons from it. An example of this would be the VC stick grenades which were made from C ration cans. They were also very capable when it came to modifying items of U.S. ordnance to fit their needs. Many large projectiles and bombs were converted to mines which were either mechanically or command detonated. They used other items such as the BLU 3/B bomblet which they converted to rifle grenades or AP mines by burying them upside down. Their skills at booby trapping were of the highest caliber. Any piece of equipment or bodies which had been left in the field had to be checked by EOD before it was recovered. To say the least this was a dangerous and unpleasant task to carry out.

The months of January and February 1968 will be remembered for a long time by those who were in Viet Nam at the time. The 31st of January marked the beginning of the infamous Tet Offensive. For the next ten days, EOD and just about everyone else in Viet Nam were engaged in heavy combat with the VC/NVA forces. EOD was called upon to perform under the most trying conditions. This is exemplified by the activities of the 170th Ordnance Detachment (ED) in Saigon. One of the prime VC/NVA targets in Saigon was the U.S. Embassy compound. Members of the 170th were called to the embassy to remove several UXOs. When they arrived, they became involved in full fledged battle that was going on for possession of the embassy. During the next eight hours the EOD team alternated between being pinned down by enemy fire and trying to work as EOD technicians. At the end of the eight hour battle, the EOD team was finally able to gain entry to the embassy compound where they removed a large quantity of UXOs. After the Tet Offensive ended, the resulting EOD clean up went on for several months.

As in WW II and Korea, EOD personnel were called upon to render assistance during surgical procedures for the removal of UXOs. This problem was enhanced by one particular weapon which was the M79 Grenade Launcher. Many enemy and friendly personnel were brought into field hospitals with 40mm grenades lodged in their bodies. The wound alone was a big enough problem without the situation being made more dangerous by the extremely sensitive fuzing system for the 40mm grenade.

U.S. Army EOD personnel were to spend many days and nights in the field with Special Forces and Recon units. This belies the belief that the EOD technician in Viet Nam was always in the rear echelon areas. Just about everyone

in the Viet Nam EOD units got to spend some time in the bush on these operations. While accompanying these units, the EOD personnel were used primarily to search and destroy various VC caches of supplies and weapons.

One favorite method of transportation in Viet Nam was the helicopter. It provided a rapid means of transportation to an incident site which was frequently inaccessible to vehicles. One problem encountered through the use of helicopters was in the fact that it was easy to get a priority flight to an incident site, and then not being able to get picked up after the incident was completed. When the helicopter arrived at the incident site, sometimes it could not land. For this very problem, it was necessary for the EOD personnel to learn the technique of rappelling from helicopters.

In 1968, the EOD units were again redesignated as Ordnance Detachments (EOD).

The EOD units in Viet Nam were required to provide training to nonEOD personnel. The most commonly taught classes are listed below:

1. Explosive Ordnance Reconnaissance
2. Booby Traps and Land Mines
3. Explosive Safety
4. Demolition Techniques.

In January 1969, the Master EOD Badge was approved for wear by those who were qualified. Some of the EOD personnel in Viet Nam were very disappointed that a special combat EOD badge had not been approved for wear by those who had served in Viet Nam.

The largest ASP to be destroyed in Viet Nam was set on fire when a trash fire got out of control at Da Nang on 27 April 1969. This was the USMC ASP and the USAF bomb dump. The resulting explosions destroyed more than 50,000 tons of ordnance. It required several months to clean up the ASP/bomb dump and the surrounding area which was littered with tons of ordnance that had been kicked out of the ASP by the explosions.

In 1969, the Volunteer Informant Program (VIP) was instituted. This concept involved the payment of monetary rewards for information or enemy material that was turned in by the local indigenous personnel. The VIP program was to be a challenge that taxed the ability of the EOD personnel severely. Their attempts at educating the personnel

who were running the collection points were never totally successful. Quite often instead of buying enemy ordnance and weapons, the VIP collection agents purchased large quantities of U.S. ordnance. When the EOD teams responded to the collection points, they often found huge piles of mixed items of ordnance. Many of the items were in an armed condition and on several occasions the piles had been booby trapped by the VC. Several times the EOD teams were surprised by the VIP agents when they drove into the unit area with a truck and trailer load of ordnance. One EOD technician was wounded while unloading one of these surprise deliveries when an item exploded in his hand after he had removed it from the trailer. The problems with the VIP program were to plague the EOD technicians until it ended.

In 1966, the total EOD incidents for that year had been 6,296. For the year 1969, the EOD incidents reached a high of 23,083 incidents. This figure is misleading in the fact that some of these incidents were several days in length and involved personnel from several units.

The years 1970 through 1973 marked the phase down of U.S. activity in South Viet Nam. Even as the U.S. Forces were being withdrawn, the EOD units that were still in Viet Nam were busy handling incidents up to the last moment before they were in turn withdrawn. After the last EOD unit was withdrawn in March of 1973, a few EOD personnel remained in country as advisors for the Vietnamese EOD program. So ended nearly eight years of EOD involvement in the Viet Nam War.

IX. The Post Viet Nam EOD Organization

It has been finally recognized that EOD is required during both peace and war time. As a result, EOD did not experience a major reduction in size or organization after the Viet Nam War ended. In the past, EOD had a major problem with growth and development because its activities were reduced after WW II and the Korean War. With the exception of a few units that have been inactivated, the EOD organization has maintained the same basic structure during the past seven years.

The present EOD mission is quite varied and very flexible. The mission responsibilities fall in the following basic categories:

1. EOD Support for the U.S. Army
2. EOD Support for Federal Agencies
3. EOD Support for Civilian Authorities
4. EOD Support for the U.S. Secret Service
5. Nuclear Weapon Incidents
6. Chemical Weapon Incidents
7. Commercial Chemical Accidents (Emergencies Only)
8. Other Hazardous Materials

During the past thirty nine years, EOD has grown from a small organization with a very narrow mission to a slightly larger organization with a very broad area of responsibility. EOD is unique in the U.S. Army because each detachment is capable of performing a mission that is far and above is small size. As long as the need exist, EOD will always be there.

APPENDIX A

Table of Basic Allowances For Ordnance Bomb Disposal Company

PERSONNEL

Captain	1
First Lieutenant	5
Second Lieutenant	2
Total Officers	<u>8</u>
First Sergeant	1
Technical Sergeant	
Platoon Leader	4
General Mechanic	1
Staff Sergeant	4
Sergeant	
Mess	1
Motor	1
Supply	1
Duty	8
Corporal	
Company Clerk	1
Duty	8
Private First Class	
Artificer	1
Auto Mechanic	1
Blacksmith	1
Bugler	1
Chauffer	27
Cook	4
Electrician	1
Mechanic	9
Motorcyclist	8
Operator Air Compressor	1
Private (Unrated)	<u>82</u>
Enlisted Total	<u>165</u>
Aggregate Total	173

EQUIPMENT

Air Compressor	1
Sedan	1
Carpenter	5
Bomb Dearing Kit	9
Demo Set	5
Motorcycle (Solo)	6
Motorcycle (W/sidecar)	2
Pioneer Set	5

APPENDIX A

Pistol	27
Light Plant, Gasoline	9
Pump, Power	10
Pump, Hand	5
Rifle	146
Scaffolding, Set	9
Tackle Set	9
Tarpulin	9
Non-Magnetic Tool Set	5
Tripod	8
Unloading Set, Bomb	5
Trailer, 1 Ton	19
Truck, 1½ Ton	19
Truck, P/U ½ Ton	6

APPENDIX B

World War II Ordnance Bomb Disposal Companies

101st	Ord	BD	Company	(Redesignated as the 237th Ord BD Co)
102nd	"	"	"	(" " " 232nd " " ")
231st	"	"	"	(First BD Company formed in WWII. As- signed to the Western Defence Command)
232nd	"	"	"	(Hawaii)
233rd	"	"	"	(Panama Canal Zone)
234th	"	"	"	(Great Britain/Europe)
235th	"	"	"	(North Africa/Italy)
236th	"	"	"	(" " ")
237th	"	"	"	(Pacific Theater)
238th	"	"	"	(Service Theater Unknown)

APPENDIX C

Table of Basic Allowances For Ordnance Bomb Disposal Squad

PERSONNEL

Officer (9224)*	1	* 9224 Bomb Disposal Of-
Tech Sergeant (924)**	1	ficer
Sergeant (924)	1	** 924 Bomb Salvager
Tech Five (924)	4	
Squad Total	<u>7</u>	

EQUIPMENT

Truck, 3/4 Ton	1	
Truck, 2½ Ton W/winch	1	
Trailer, 1 Ton	1	
Block, Ordinary 1"	1	
Block, Snatch 1"	3	
Asbestos Mittens, M1942 (pr)	2	
Photographic Set	1	
Demo Equipment Set No.1	1	
Container ½lb S/C	10	
Fuze Deactivator 4-D-20	1	
Fuze Deactivator 4-D-25	1	
Fuze Discharger	1	
Drill Set	1	
Fuze Extractor	1	
Comp C Explosives	10	lbs
Stethoscope	1	
Tool Set, Non-sparking	1	
Vise	1	
General Mechanic Tool Set	1	

APPENDIX D

Bomb Disposal/Explosive Ordnance Disposal Unit Designations

The following unit designations have been used to identify BD/EOD units from WW II to the present.

1. Provisional Bomb Disposal Company (April 1942)
2. Ordnance Bomb Disposal Company (May 1942)
3. Ordnance Bomb Disposal Squad (Seperate) (February 1943)
4. Ordnance Service Detachment (January 1945)
5. Ordnance Bomb Disposal Squad (Seperate) (April 1945)
6. Ordnance Bomb Disposal Squad (Provisional) (1946)
7. Explosive Ordnance Disposal Squad (December 1949)
8. Ordnance Detachment (EOD) (1954)
9. Ordnance Detachment (ED) (1959)
10. Ordnance Detachment (EOD) (1968)

Colonel T. J. KANE COMMANDANT BOMB DISPOSAL SCHOOL



MALTA
PRO.
A.P.G.



COMMISSIONED IN OFFICERS' RESERVE CORPS AT THE AGE OF 24. THE ARMY WAS HIS HOBBY BEFORE HE WAS CALLED TO ACTIVE DUTY.



WAS CAPT. IN THE CCC-COMMANDED TWO CAMPS AND SUPERVISED THE BUILDING OF ONE OF THEM.

TO STUDY BOMB DISPOSAL, HE FLEW OVER WORLD'S BATTLE FRONTS IN ENG., N. AFRICA, MALTA AND INDIA.

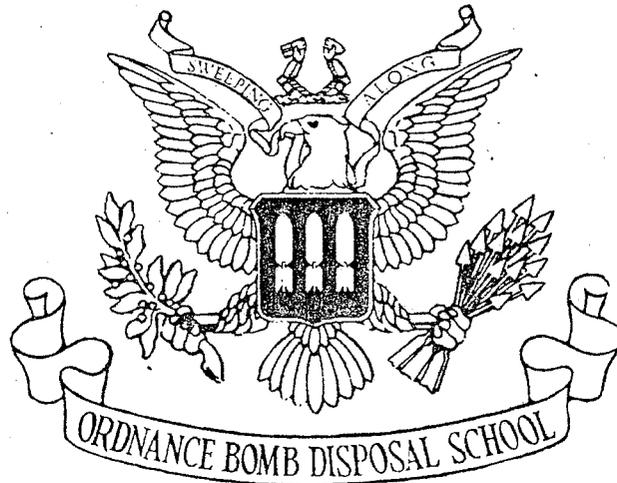


WAS FORMERLY YARDMASTER FOR THE B & ORR AT ROCHESTER, N.Y.

ARMY SERVICE FORCES
ORDNANCE DEPARTMENT
ORDNANCE BOMB DISPOSAL SCHOOL
ABERDEEN PROVING GROUND, MD.
U.S.A.

BOMB DISPOSAL TECHNICAL INFORMATION

BULLETIN NO. 25



1 APRIL 1944

INFORMATION ON ENEMY BOMBS, ARTILLERY
PROJECTILES, FUZES, MINES, AND BOOBY TRAPS
SHOULD BE SENT TO THE COMMANDANT, ORDNANCE
BOMB DISPOSAL SCHOOL, ABERDEEN PROVING
GROUND, MARYLAND.

APPENDIX F

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APPENDIX F

T-41 BOMB, FUZE, TAIL (see B.D. Information #23)

In order to clarify the functioning of the T-41 Bomb Fuze Tail, the following is quoted from a memorandum from the Ammunition Branch, Industrial Division, Office of the Chief of Ordnance:

"These fuzes are similar to the M123 Series except that the delay is from 5 to 10 minutes only. The fuze functions as follows: As the bomb leaves the plane, the arming wire is withdrawn and the vane rotates. This causes the arming stem (1) to rotate at reduced speed, but the stem does not move axially either up or down as in other tail fuzes, since it is held in place by the collar which is pinned to it. However, the rotation of the stem causes the plunger (2) to unscrew from it and to be forced down so that the knife edge (3) pierces the thin copper sealing cup at the bottom of the Bellows Assembly, thus permitting the acetone contained in the Bellows to flow down onto the plastic tube delay element (4). As the plastic tube is dissolved by the acetone, the arming housing (5) moves up under the pressure of its spring (6) until it is high enough to allow the balls (7) to move out so that the Firing Pin (8) is forced down on the primer."

REPORTS FROM THE FIELD:

Capt. L. B. Altman
1st Lt. A. J. Gavaldon
1st Lt. E. V. Struzik
Capt. V. P. Kovar
1st Lt. S. V. C. Larkin
1st Lt. R. W. Walkup
2nd Lt. F. J. Hollenbach

Capt. G. C. Sarauw
1st Lt. J. F. Reichman
1st Lt. A. E. Wheeler
Capt. R. P. Tobin
Capt. R. G. Fisher
2nd Lt. F. Desmarias
1st Lt. L. G. McClellan

FM 5-31 "LAND MINES AND BOOBY TRAPS."

This new Field Manual was written by the Corps of Engineers and was published 1 November 1943. Change No. 1 appeared 10 February 1943. The manual will be of great value to all B.D. Officers and E.M. in the Field. Land Mines and Booby Traps of American, British, German, Italian, Japanese, French, Hungarian and Russian design are illustrated and described. This manual should soon be distributed to you through normal channels and cannot be distributed by the school.

APPENDIX F

92ND ORDNANCE BOMB DISPOSAL SQUAD
7TH ARMY GARRISON FORCE
APO 459

1 February 1944

SUBJECT: Operation report

TO : Commandant, Ordnance Bomb Disposal School, Aberdeen Proving Ground, Maryland. Thru: Bomb Disposal Office, Hdqs., Central Pacific Area, APO 958, San Francisco, California.

1. The following is a summary of the activities of this unit for the period 10 November 1943 to date.

2. This unit was assigned to the 27th Division on DS fr 232nd Ordnance Bomb Disposal Company, APO 958 in compliance with SO 286, Hdqs., USAFICPA, Dated 13 October 1943.

a. After completion of amphibious training departed with elements of the 27th Division to attack and hold the island of BUTARITARI, MAKIN ATOLL, landing there with assault forces on "D" Day, 20 November 1943.

3. Primary mission was to clear beaches of dud shells, the result of our own naval gunfire, that were hampering landing operations. During the period 20 Nov 43 to 23 Nov this unit took care of the following:

a. American Materiel: 2 ea. 500 lb GP-HE bombs, 1 ea. 100 lb GP-HE Bomb, 23 ea. 5 inch Naval HE Shells, 16 ea. 8 inch Naval HE Shells, 11 ea. 14 inch Naval HE Shells were inspected and abandoned after being marked. Danger to personnel, and equipment prevented their movement or destruction during operations.

b. Japanese Materiel: 19 ea. 63 Kg. GP-HE Bombs, 36 ea. 32 Kg. Practice Bombs, Concrete filled w/2 pound charge in tail, 3 ea. 1 Kg. Anti-Personnel Incendiary Bombs were dumped at sea in order to clear Kings Wharf for an unloading point for LST's.

c. A large number of mines and booby traps reported by front line troops were investigated and discredited. It was found that Naval Gunfire and Dive Bombing Attacks had caused strikes on all underground dumps. The fuze house was completely destroyed.

d. The following types of fuzes have been found, but are in poor condition due to being exposed to heat when the fuze house was gutted:

B-2 (a) Navy Mechanical Impact Tail Fuze 2511.T20
B-3 (a) Navy Mechanical Impact Tail Fuze 2511.T30

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e. The following types of mines have been found in small dumps scattered around the island:

1 Kg Incendiary Anti-Personnel Bomb	1521.1
31 Kg Practice Bomb (Tech Info Bulletin No. 16)	
60 Kg GP-HE Type 97 Bomb	1553.1
64 Kg GP-HE Type II Bomb	1555.1

f. Several bomb cases were found in the fuze house that closely resemble the case of the 50 Kg. Gas Bomb. Fire had destroyed the filler, and no markings were visible for identification. An examination of the ashes in and around the fuze lockers unearthed no fuzes that might be used with it.

4. This unit was returned to Oahu, T.H., on 24 November 1943 with the 27th Division. Upon arrival it was found that we had been assigned to the 7th Army Garrison Force at APO 459. Return to this Station was completed by 26 December 1943.

5. Since our return we have been engaged in the preparation of Japanese ammunition and some Anti-Aircraft and Seacoast Defense Guns for shipment to the Ordnance Officer, Hq USAFICPA, APO 956. All Naval duds have been removed and dumped at sea together with such items of Japanese materiel as were considered not worth salvaging.

6. Raid 28 Dec 43: Air Raid at 281900. Planes approached from 20 degrees at 20,000 feet altitude. Six (6) bombs were dropped into the ocean at 281924 about 1,000 yards off shore at Ukiangong Point.

7. Raid 29 Dec 43: Air Raid at 290640Z. Estimated fifteen (15) bombs dropped. Two natives slightly injured. A number of bombs fell in the Lagoon. Several duds or delayed action bombs were reported by Hq Air Force at the east end of the Air strip. These were investigated and discredited. One bomb fell near an AA position. All that fell on the island were 63 Kg. GP-HE fitted with short delay fuzes.

8. Raid 4 Jan 44: Estimated 6 bombers vicinity of Makin 040800Z to 1015Z. Eight bombs dropped in Lagoon. Other bombers continued south. No damage. No casualties.

9. Raid 11 Jan 44: Air Raid sounded 111100Z. Two (2) enemy bombers approaching from the south. One passed the island 60 miles to the east, the other passed 60 miles to the west. The bomber to the west after reaching a point west northwest of the Atoll, came in at 290 degrees at 21,000 feet, crossed the lagoon and island, dropped eight bombs as he crossed. Four bombs, one of which failed to explode, landed about 400 yards off shore west of the Air Strip. The other four bombs fell into the ocean on the opposite of the island.

APPENDIX F

10. Raid 16 Jan 44: Subject to separate report dated 30 Jan 1944. Additional photographs taken with a borrowed camera will be forwarded as soon as the prints can be developed and printed.

11. The assigned mission of this unit having been completed in that all Japanese explosives to include bombs, shells, and naval guns have been either destroyed, dumped at sea, or shipped out, work is being directed to the construction of a booby trap course for use in the instruction of all personnel assigned to this Station.

The island of Butaritari was not mined, nor were any booby traps found emplaced or in storage. It was noted however that carelessness on the part of troops during the initial operations particularly in regards to the collection of materiel would have, in the event that traps had been set, been the cause of a great number of casualties.

/s/ George C. Sarauw
Capt., Ord. Dept.,
Commanding

German H.S. 293 Glider Bomb

AMI 586

In Bomb Disposal Technical Bulletin #24 was printed a drawing of the HS 293 German Radio-Controlled Glider Bomb. The following is additional information intended to give a general picture of the weapon, its probable performance within limits of information gained to date.

DESCRIPTION

The weapons of robust construction throughout, is a mid-wing monoplane glider with underslung propulsive unit attached by a cast tripod; the tail plane is high and the bulk of the fin is below the aircraft line. Neither main or tail planes have dihedral, and control is effected by ailerons and elevators only. The fuselage comprises the nose, containing the bomb, the centre, housing the radio control and the tail unit; the skin of the latter two sections being continuous.

Dimensions

(a) The main dimensions of the Glider Bomb are as follows:-

Total Span	10 ft.
Overall length	10 ft.
Bomb diameter	1 ft. 7 ins.
Propulsion Unit length	6 ft. 6 ins.
Propulsion Unit diameter	1 ft. 2 ins.

(b) The weights of the main parts are as follows:-

Bomb	1120 lbs.
Propulsion unit (with propellant)	260 lbs.
Main planes	150 lbs.
Tail unit and fuselage skin	100 lbs.
Radio batteries, controls, etc.	100 lbs. (estimated)
Estimated all up weight	1730 lbs.
Estimated weight of expendable propellant	120 lbs.
Estimated all up flying weight	1610 lbs.

Performance

- (a) Because range is directly dependent on height of release there can be no relevant maximum range, but operational ranges are probably determined by conditions of visibility, cloud ceiling and the optics of viewing.
- (b) If the example of a H.S. 293 released at 200 m.p.h. from a height 3,000 ft., propelled with a propulsion thrust of 1,500 lbs. for 12 seconds in level flight, brought into a dive that just maintained speed, and finally flown horizontal at sea level -

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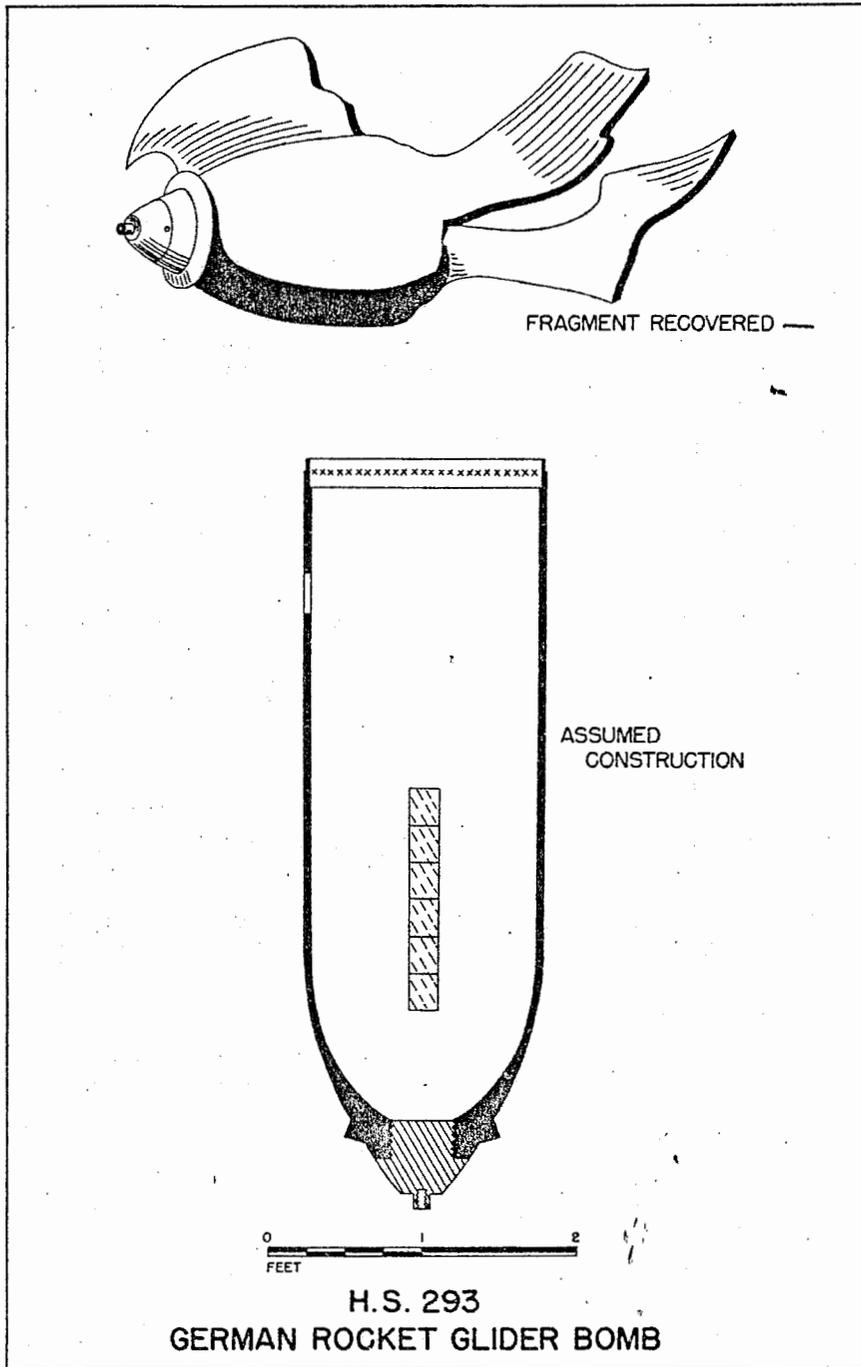
is taken, then it is calculated that the total horizontal range from a height 3,000 ft. to a speed of 300 m.p.h. at sea level would be 28,000 ft. in a total time of 55 seconds.

- (c) Again working on the above data, it is further calculated that the stalling speed would be of the order of 145 m.p.h.

On page 113 is shown fragments of an H.S. 293 that was reported by MEIU #2. The Germans have been using many of these bombs in their raids on Anzio. It is believed that they are used primarily against shipping and that the bombs which have landed on the shore were either jettisoned from crippled bombers or were out of control due to parent craft having been hit.

The fragments shown were the remains of a bomb that was observed to hit one building at which time there was a great white flash; it then travelled about 250 yards and hit another building and partially detonated, the nose travelling another hundred yards and lodging itself in some thick trees about 6 inches above the ground. The white flash is believed to have been the self destroying device in the radio unit, as most of the fragments were found in that vicinity.

APPENDIX F



APPENDIX F

GERMAN - Phosphorus bomb - "Brand C50B" (DBD 60 & Lt. J. I. Bocelato)

A modified type of German phosphorus incendiary bomb, designated "Brand C50B" was dropped during recent attacks on the U.K.

Description:

The bomb is the same size as the normal S.C.50 Kg., but has a nose filler plug similar to that of the Sprengbrand C.50., and a female filler cap similar to that fitted to the MARK 500 BODEN container. The bomb is painted sandy grey and has two 3/4" wide red bands, one on the nose, and the other between tail and suspension lug. The markings include a small bottle painted in red between nose and fuze. It is assumed that this indicates that there is a bottle containing white phosphorus inside the bomb.

Construction:

The cast nose piece is welded to a thin sheet metal casing which is welded along a longitudinal seam, and strengthened internally to take the suspension lug.

The tail is of the normal shape, but is fixed by two studs to brackets on the base which are threaded to receive them.

The female base filler cap has two projecting studs and is provided with an internal washer.

The fuze pocket is T-shaped. The cross-arm of the T is similar to a normal fuze pocket. The leg of the T, which is of the same internal diameter as the cross-arm, runs from the centre of the cross-arm to the nose of the bomb to which it is secured.

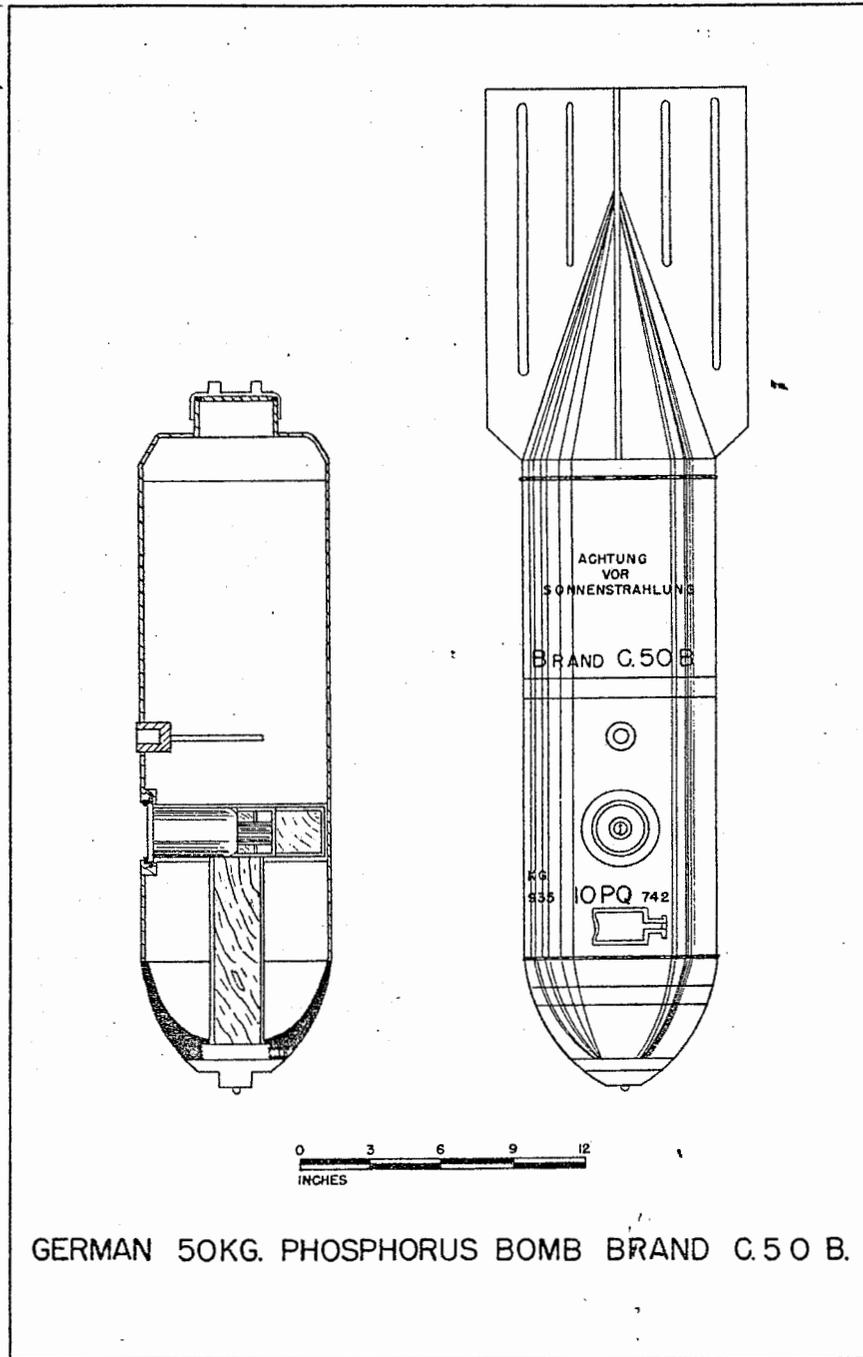
The screwed nose plug gives access to the leg of the T and is of sufficient diameter to permit the introduction of standard picric rings.

Fuzing and exploder system:

In the samples examined, the normal ("cross-arm") portion of the fuze pocket was fitted with a (28)A fuze and a steel-cased gaine projecting into first a wooden ring and then a picric ring, each ring being 5/8" thick (i.e., half the thickness of the usual picric ring as fitted to H.E. bombs). A wooden plug filled the space between the gaine and the end of the "cross-arm."

The leg of the fuze pocket was filled with a solid wood cylinder, in some cases sealed off the filler plug end by sealing compound.

The object of the T-shaped fuze pocket is not clear. The leg of the T may well have been designed to hold one or more explosive pellets,



GERMAN 50KG. PHOSPHORUS BOMB BRAND C.50 B.

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(blanked off from that in the cross-arm portion) which might be expected to detonate some little time after the filling started to burn. Although no samples yet examined have been so fitted, the possibility must be borne in mind. Then again it has been suspected of being intended for use as a gas bomb and is being dropped as an incendiary. The leg of the "T" could be filled with explosive which in addition to picric rings would scatter gas in a fine mist over a large area.

Incendiary filling:

The filling consists of the usual sticky liquid associated with phosphorus-oil bombs, but the bottle depicted on the casing and the fact that broken amber glass and white phosphorus have been found in the nose of unignited bombs tend to show that the phosphorus is contained in a bottle which breaks up on impact.

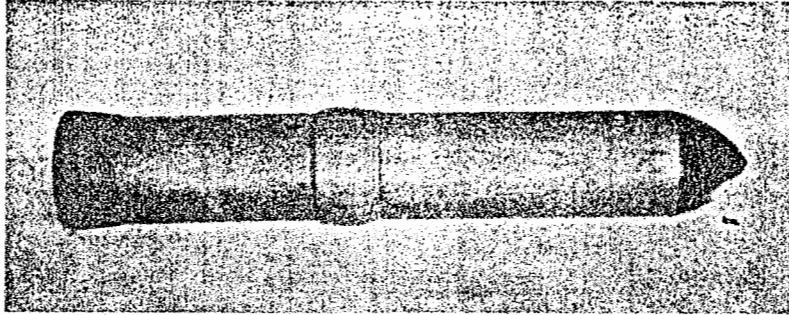
Operation:

When the impact fuze functions, the consequent detonation of the picric ring splits open the bomb casing, ejects some or all of the incendiary filling and breaks the bottle containing white phosphorus which, on exposure to the air, causes the incendiary filling to ignite.

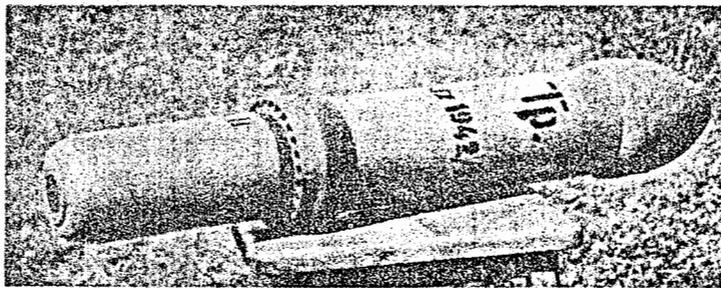
Even when the fuze does not function however, the bomb casing is frequently split wide open and twisted on impact owing to its light construction, and the phosphorus bottle also breaks. In this case also the filling may ignite, in which event the picric exploder ring and gaine will subsequently explode owing to the heat.

The fact that the thin casing frequently becomes so much deformed on impact may give the impression that the fuze has functioned when in fact it has not done so. It is not therefore safe to assume that the picric exploder ring has detonated until it can be verified, by inspection of the fuze pocket, that such is the case. Accidents have occurred owing to faulty diagnosis in this respect and subsequent detonation of the exploder system. One slight accident occurred when the nose portion only was being burnt out, some distance away from the fuze pocket. This is thought to be due to fragments of the glass bottle projected by the explosion of a mixture of air and benzine vapour which was trapped in the nose.

GERMAN FIELD ROCKET AMMUNITION



7.3 cm. Propaganda Rocket — overall length 16.1 ins.



15 cm. H.E. Rocket — overall length 39.8 ins.



21 cm. H.E. Rocket — overall length 49.25 ins.

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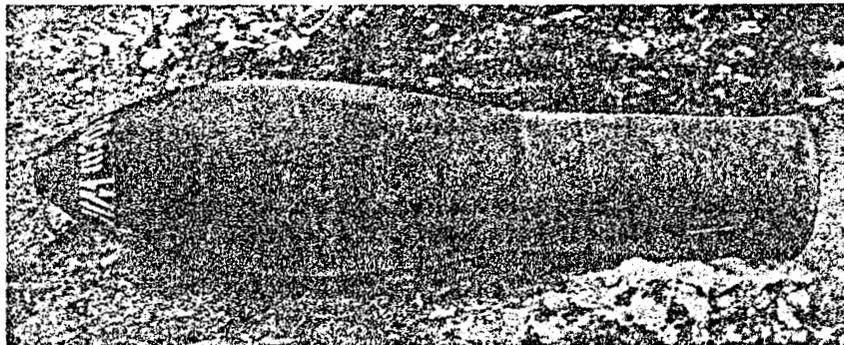
GERMAN FIELD ROCKET AMMUNITION

TABLE

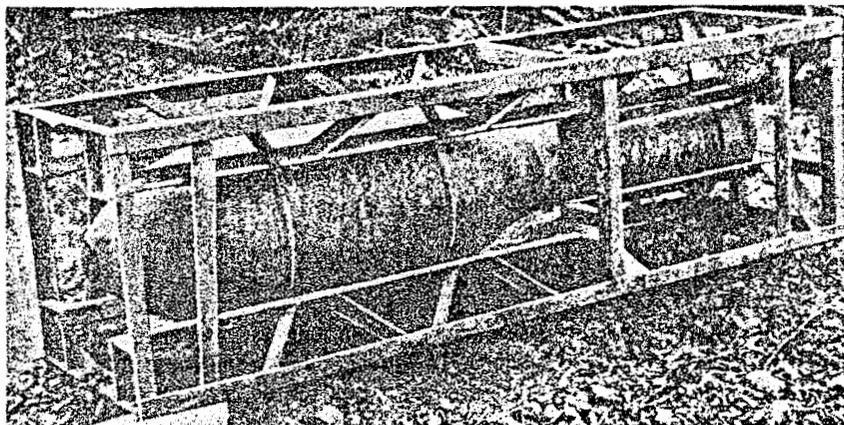
(AF HQ BD INTEL #2)

CALLIBER	USE (to date)	OVERALL LENGTH (ins)	WEIGHT (lbs)		Propel- lant	GERMAN NAME	FUZING		RANGE yds.	REMARKS
			Total	Bomb Filled			Type	Marking		
7.3 Cm	Propaganda Leaflets	16.1	7.2	4.5	1	Propaganda- granate 41	Time (Air- burst)			Fitted with percus- sion igniter.
15 Cm	H.E.	36.4	77	22.5	14	15 Cm Wurf- granate 41 Spreng			8620	Shell at rear of rocket container. Propellant vents through central venturi block.
	Smoke	39.8	78	23.5	14	15 Cm Wurf- granate 41 wRn Nebel				
21 Cm	H.E.	48.2	245	90	40.25	21 Cm Wurf- granate. 42 Spreng	Artill- lery	Z 23 hA 0.15 Wgt	9950	
28 Cm	H.E.	47.6	183	133.5	14.5	28 Cm Wurf- korper Spreng	Impact	Z 50 + bmv 42		Wooden or metal crates used for transport may act as firing guide.
30 Cm	H.E.	46				30 Cm Wurf- korper 42 Spreng			2440	Fitted with percus- sion igniter.
32 Cm	Incen- diary	49.2	174	124.5	11 gals.	32 Cm Wurf- korper Flamm	Impact	Z 50 + bmv 42	2450	Wooden or metal crates used for transport may act as firing guide.

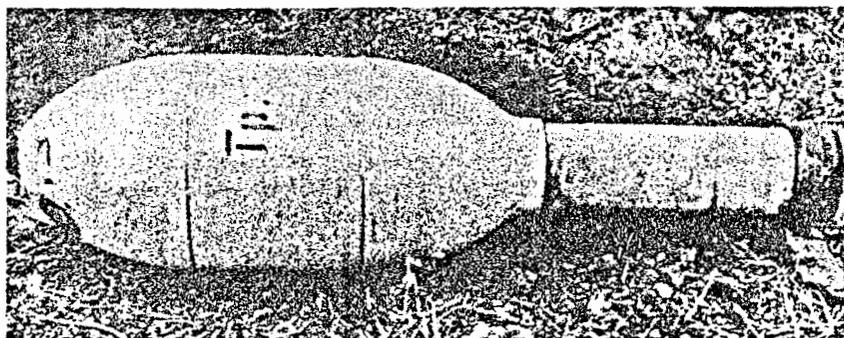
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30 cm. H.E. Rocket — overall length 46 ins.



28 cm. H.E. Rocket — overall length 47.6 ins.
(in transport and firing crate)



32 cm. Incendiary Rocket — overall length 49.2 ins.

APPENDIX F

JAPANESE Improvised Mine

A crudely constructed Japanese mine was examined by Lt. Albert E. Wheeler and the 106th Bomb Disposal Squad. The mine is a crude, makeshift affair, detonation of which would appear to be uncertain and from which low order bursts might be expected to occur with some frequency. Whether this improvisation indicates a shortage of Type 93 land mines in the enemy's hands or is an attempt to improvise a mine with a heavier explosive charge than the Type 93 mine is not clear.

The description of the mine as given by the 106th Bomb Disposal Squad is as follows:

Size: A box 5 5/8" x 4 1/4" x 3 1/4"

Material: Tin

Color: Silver

Construction of body:

A rectangular box with a cover securely fastened by friction tape. Two holes are roughly punched in the cover through which a grenade fuze or detonator projects. The grenade fuze projects approximately 3/4", projection of detonator is unknown.

Type of filling:

One Japanese type (91) hand grenade. Twelve blocks of 1/3 Aluminum powder and 2/3 RDX (?). Each block is 1 1/2" x 3/4", wrapped in waxed paper. Color is black. The grenade and blocks, 1/3 Aluminum powder and 2/3 RDX, are firmly held in place by waxed paper.

Functioning:

As an Anti-Tank Mine.

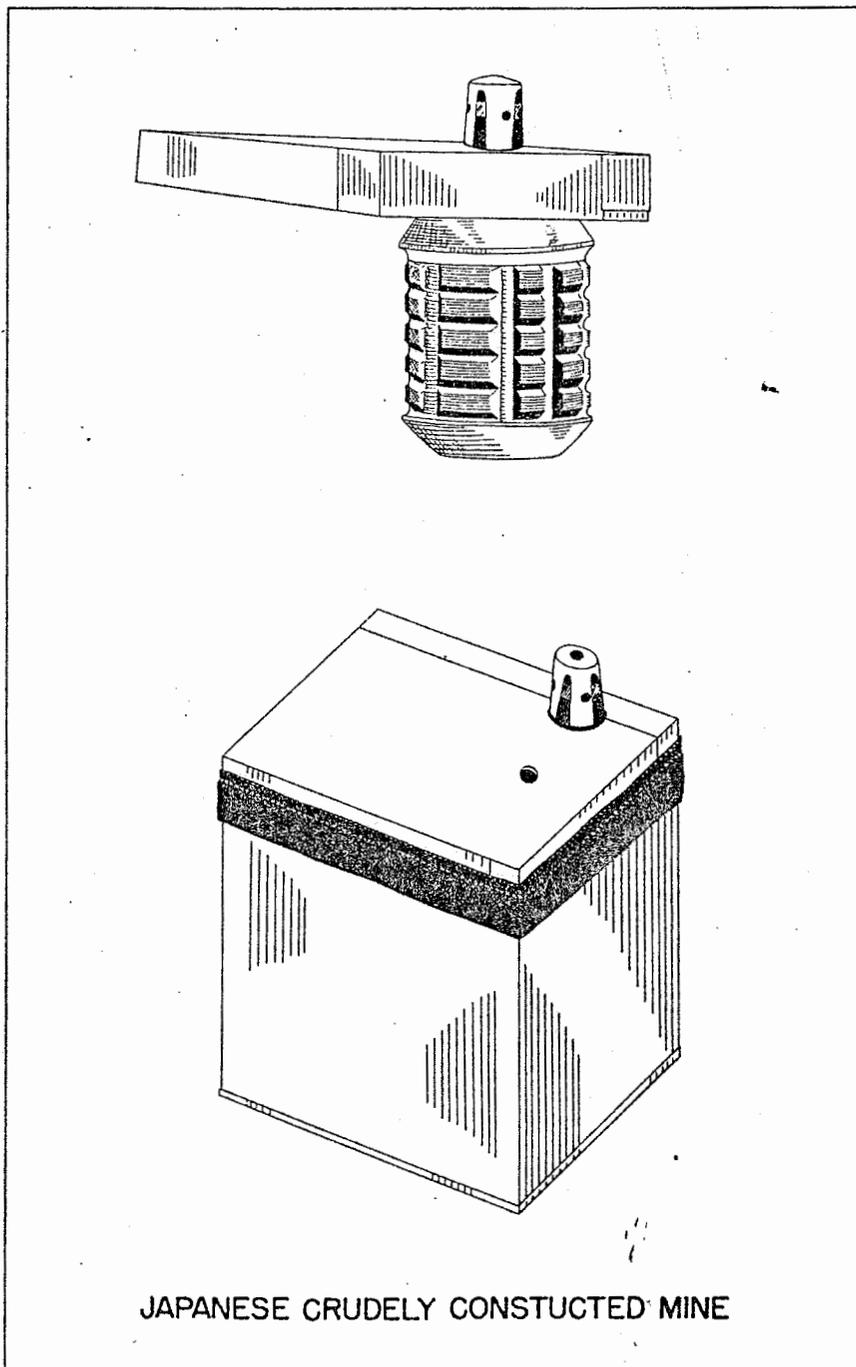
Safety pin on fuze is removed. When it is hit by a sharp blow the striker breaks a shear wire and penetrates the primer. After a delay of 4 to 5 seconds the bursting charge then explodes setting off the charge.

As an Anti-Personnel Mine or Booby Trap.

A push-pull detonator is inserted into the explosive. When the trip wire is pulled or released the striker penetrates the primer setting off the explosive and hand grenade.

Effects:

Effect is unknown. With the grenade fuze armed it can be used as an anti-tank mine. With a pull or tension detonator it can be used as an anti-personnel mine or booby trap.



JAPANESE CRUDELY CONSTRUCTED MINE

APPENDIX F

JAPANESE ANTI-AIRCRAFT MISSILE

A new type of Japanese Antiaircraft Missile has been recovered by an Indian Bomb Disposal Company and reported by U.S. Naval Liaison Officers at Bombay, India. These missiles are believed to be projected by unknown means, from aircraft when being attacked from directly astern. Time lag of fuse allows for burst of missile in path of pursuing aircraft. One pilot when astern an enemy plane had what is assumed to be one of these burst in front of him with minor dents in the plane as the only damage.

General description. The missile is a black spherical container 5-1/2 inches in diameter, of compressed paper, approximately 3/32 inch thick with an open neck of compressed cardboard, which projects approximately 3 inches. Total weight of the missile is 36-1/2 oz. The spherical portion contains a black granular powder charge in a silk bag which is surrounded by 32 high explosive pellets. The black powder charge, which is ignited by a friction pull-igniter in the base of the neck, is designed to burst the container after a short delay and scatter the high explosive pellets. At the same time the black powder bursts the container, it also ignites the short fuses which project from each pellet. After a short delay, the pellets are detonated.

Detailed description.

(a) Container - The spherical part of the container is constructed of three portions of compressed paper about 3/32 inch thick. One portion is hemispherical and has a compressed cardboard tube 1-7/8 inches in external diameter and 1/8 inch in thickness. The other hemisphere is in two parts for purpose of assembly. Successive layers of paper, total thickness 1/16 inch, overlay the three portions and have been pasted on after filling the container. The outside of the container has been colored black probably with waterproofing liquid. A wood plug, which contains the igniter holder, is fitted to the base of the tubular neck.

(b) Burster Charge - This consists of a black granular powder, probably gun powder, which weighs 4-1/4 ozs. and is contained in a silk bag. One end of the bag, in the form of a sleeve, is tied over the wood plug at the base of the neck with thread. The other end is drawn together and bound with a few turns of similar thread. The whole outside of the bag has been treated with a black liquid, probably waterproof.

(c) Igniter - This is a brass friction pull-igniter type and is held in the wood plug at the base of the neck by two small brads. One end of the igniter projects into the open neck, and a 3/4 inch length of fuse at the other end projects into the black powder burster charge. Delay of the fuse is unknown.

(d) High Explosive Pellets - There are 32 pellets, each weighing 2/3 oz., in the spherical part of the container. The type of high explo-

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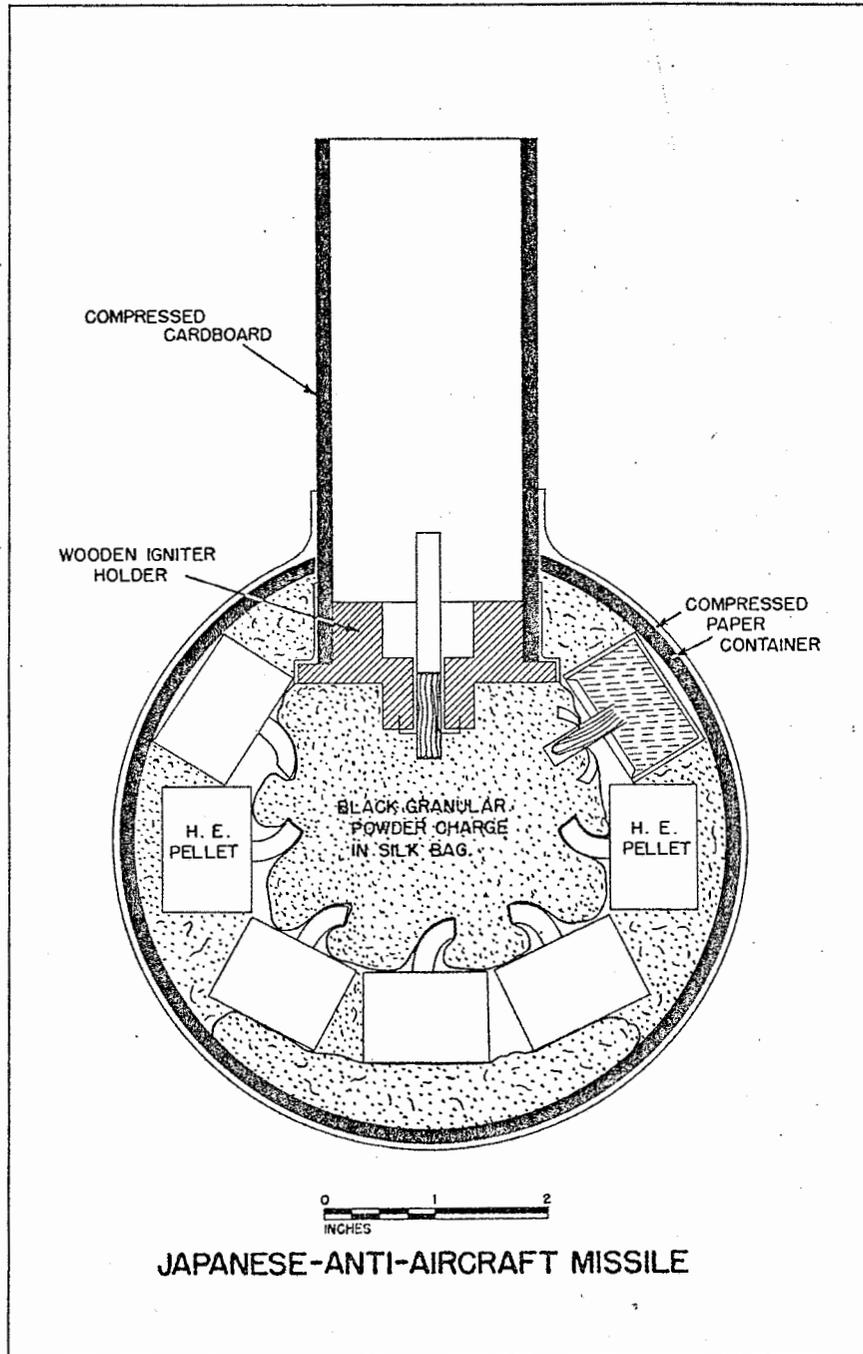
sive is unknown. An analysis of the explosive is to be made, and the resulting information will be forwarded. The high explosive is contained in a sheet metal case, 1-1/8 inch in diameter and 13/16 inch high. A 1/2-inch fuse, with a short length of quick tape attached, projects from each pellet, and there is a thin cardboard disc around each pellet with a disc at the bottom. The pellets are arranged in the missile so that the fuse and quick tape are in contact with the bag containing the black powder charge. The interstices are packed with cottonseed husks, and a pad formed of these husks wrapped in paper was packed in the end of the sphere.

Handling - If these missiles are recovered, the probable cause of failure will be that the igniter has not functioned. In this case the missile may be handled with reasonable safety if care is used. If a string is visible at the open neck, great care should be taken not to pull or disturb it.

JAPANESE 250 Kg. Incendiary

Samples of Japanese 250 Kg. Incendiary Bombs recovered by Lt. Gavaldon and Wheeler of the 106th and 107th Bomb Disposal Squads, definitely proved that they have the standard Navy type horizontal lugs. Lug and plate are held to body by four (4) rivets. This is file number 1525.10 in TM E9-1983.

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APPENDIX F

ARMING MECHANISM ON THE JAP 1 KG ANTI-PARKED AIRCRAFT BOMB (Credit Lt. W. E. Comstock, 102nd B.D. Squad.)

Recent recoveries have now made clear the method of arming the 1 Kg. shaped charge anti-parked aircraft bomb. (See drawing on page 128.)

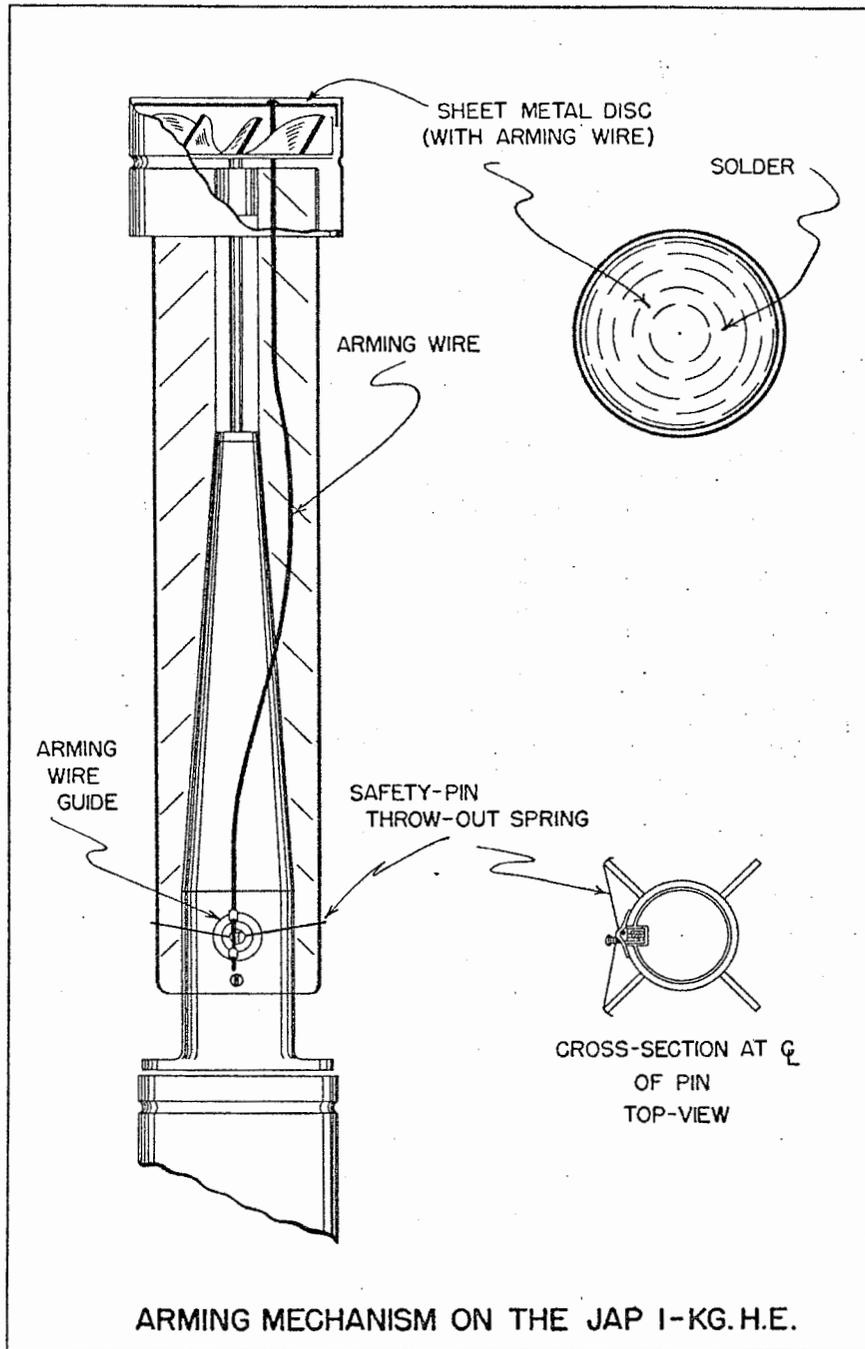
The arming sequence is as follows:

1. After the container opens and bombs fall away air pressure against disc withdraw it and the arming wire out of bomb.
2. This releases the arming vanes and the spring loaded detent which has been locking the striker inertia block in fuze.
3. Spring throws out the detent. Vanes rotate removing reach rod out of striker block.

Quoting from Lt. Comstock's report:

"It is interesting to note that although we have recovered many of these bombs singly, as duds, there has never been an instance where this disc-wire-pin combination has failed to function as intended. In the incident resulting in the recovery of these parts, we found an entire cluster which had failed to burst, thus the entire device was intact, although badly smashed by impact. Also interesting is the fact that although the cluster hit with sufficient force to smash perhaps fifty-percent of the bombs open, powdering the cast picric charge, there was no shock-detonations."

"By way of verification of previous data, the container did contain forty bombs."



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