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FOREWORD

To be effective in battle an artillery force must meet with and destroy the enemy. One of the first things to be considered is their disposition. Although the name for doing this was changed the purpose remains the same. In field artillery parlance it has been called survey, observation, counter-battery, counterbombardment or locating. This bibliography is concerned with two components of survey that give the direction to triangulation and chart-map traversing. These terms are sound and flash ranging which were first developed during WWI, by forces of the United States Army.

Sound ranging uses principles of acoustics for gun spotting. An arc of microphone pick-up stations record the sounds of enemy guns and calculate their location and distance along a base line by plotting "rays" in that direction. This system was perfected by U.S. artillery during WWI to the extent that 117 German gun positions were located and destroyed in a single twenty-four hour period. During WWII, the fact that sound is greatly amplified by sub-zero conditions allowed the Russians to use this process to excellent advantage against the German artillery on the Eastern front.

Flash ranging, a term often used with sound ranging, locates guns by their muzzle flash. During WWII U.S. field artillery fighting techniques made much use of this means to effectively decimate the axis forces so as to win the war. This was used particularly at night. Today, developments in smokeless and flashless gunpowder necessitate the use of radar, infrared, and other devices to achieve the same goal.

This bibliography presents points of view and lessons learned from British, French, German, Russian, and U.S. experience. Presented here are materials from books and periodicals which provide historical and contemporary coverage.

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BOOKS

- *UF157
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Vert. File Allied Forces. Field Artillery Section. FUSAG Questionnaire for Observer in Italy, AFHQ, c1944.
- UF481.6
B3 Bazzoni, C.B. Note on the Accuracy of Sound Ranging Locations, France, 29th U.S. Army Engr., c1918.
- UF481.6
C3 Conference on Sound Ranging. Record, Wash., D.C., c1938.
- UF481.62
D3 Denver Research Inst. Reports on the Study of Meteorological and Terrain Factors Which Affect Sound Ranging, Denver, CO., c1954.
- *UF481.6
F3
Vert. File Feldman, M.M. Tactical and Technical Questions Relating to Sound Ranging, Ft. Sill, OK: USAFAS, c1952.
- UF481.6
F8 France Ministere de la Guerre. Fire Against Aerial Objectives, Provisional Instructions for Firing by Sound, 25 Feb, 1918.
- UF481.6
G3
1943
Q0 Germany, Reichskriegsministerium. Miscellaneous Papers on Artillery Survey and Sound and Flash, Artillery Manual, Wash., D.C.: M.I.S., c1943.
- UL505.45
G3G7 Translation, Artillery Handbook, Wash., D.C.: M.I.S., c1940.
- UF481.6
G7 Great Britain. War Office. Meteorology for Sound-Ranging, London, Eng: HMSO, c1939.
- UF481.6
G7
1919
F0 Textbook of Artillery Survey Observation, Part II, Sound Ranging, London, Eng: HMSO, c1919.
- UF481.6
I6 Innes, John R., Comp. Flash Spotters and Sound Rangers; How They Lived, Worked, and Fought in the Great War, London, Eng: Allen & Unwin, Ltd., c1935.
- U15
J7
No. 62
F0 Johns Hopkins Univ. Operations Research Office. Sound Ranging for the Field Artillery, F.T. Innes. Wash., D.C., c1950.
- UF157
L3 Lanza, Conrad Hammond. Papers and Problems, 1919-20. Cornwallville, N.Y.: Hope Farm Pr., (c1970).

QC806 Melton, Edward R. A Military Aspect of Exploration Geophysics,
M3 Reprinted from Geophysics, 3:1, Jan. 1938.

UL555 Murgatroyd, R.J. A Comparison Between Long Sub-Base, Short
S6MB Sub-Base and Triangle Systems of Sound Ranging, Larkhill, Eng:
Royal Arty School of Survey, (c1942).

*UF481.45 Myrick, William S. Employment of Field Artillery Observation
M9 Battalion, HQ., ETO, c1942.
Vert. File

UL565 Radio Corp. of America. Short Range Missile Launch Locater,
R2 AN/TNS-5, Camden, N.J.: The Corp., c1961.

UF481.6 Talonov, A.V. Artillery Sound Ranging, Russ. Docu., Ft. Sill,
T2 OK: USAFAS, c1952.

U383.5 US Army Air Defense Human Research Unit. Studies on Reduced-
U64 Scale Ranging Training with a Simple Range Finder, Michael R.
TR71-24 McCluskey, Ft. Bliss, TX., c1971.

*UF23.5 U.S. Army Field Artillery School, Ft. Sill, OK. Field Artillery
R4U5 Target Acquisition Devices, c1972.
RNTA 1000
Vert. File

*UF481.5 U.S. Army Field Artillery School, Ft. Sill, OK. Flash Ranging on
U5 Machine Guns, c1944.
Vert. File

*UF23.5 U.S. Army Field Artillery School, Ft. Sill, OK. A Method of
M1 Sound Ranging Adjustment of Artillery or Mortar Fire Without
6-2 Survey of the Sound Base or Use of a Plotting Chart, c1945.
Vert. File.

*UF481.5 U.S. Army Field Artillery School, Ft. Sill, OK. Report of
U51 Special Test Concerning Flash Ranging on Searchlights, c1952.
Vert. File

*UF23.5 U.S. Army Field Artillery School, Ft. Sill, OK. Sound-on-Sound
P71 Adjustment, Programmed Text, c1976.
AT22A
Vert. File

*UF23.5 U.S. Army Field Artillery School, Ft. Sill, OK. Sound Ranging
P71 Installations, Programed Text, c1975.
AT05A
Vert. File

*UF23.5 U.S. Army Field Artillery School, Ft. Sill, OK. Sound Weather
P71 Corrections, Programed Text, c1976.
AT72A
Vert. File

UF23.4
A7
FO U.S. Army Field Forces, Advisory Panel on Field Artillery. Report of Army Field Forces Advisory Panel on Field Artillery, 18 Feb 1949, Wash., D.C., c1949.

*UJ195.32
U5
Vert. File U.S. Army Field Forces Board No. 1. Artillery Sound Ranging Correction Charts, Ft. Bragg, N.C., c1952.

*UF481.6
G7M2
1943
Vert. File U.S. Army General Staff, G-2. Desert Warfare - Sound and Flash. Wash., D.C.: M.I.S., WDGS, c1943.

UF481.6
U5
1918b U.S. Army GHQ, AEF. Adjustment of Artillery Fire by Flash and Sound Ranging Sections, France, 29th U.S. Army Engr., c1918.

*UF481
M3
1943
Vert. File U.S. Army Ground Forces. Partial Report of Observations, Lt. Col. E.R. Melton. 30 parts, Wash., D.C.: AGF, c1943.

*UF157.241
U5
Vert. File U.S. Army Ground Forces. Sound Ranging From Mortars, Wash., D.C.: AGF, c1944.

*UC470.3
A6G3
FAWT-4647-15
Vert. File U.S. Army Ground Forces, Board, No. 1. Report of Study of 1946-47 Winter Test of Flash Ranging Equipment By Task Forces Frigid and Frost. Ft. Bragg, N.C.: AGF Bd, c1947.

*UF481.6
G3U5
1945
Vert. File U.S. Army. 292d Field Artillery Observation Bn. German Sound Ranging, c1945.

UF481.6
U5
1917 U.S. Army War College, Wash., D.C. Lecture on Locating Batteries by Sound, Gen. Bourgeois, Tr. of FR. MS, Wash., D.C.: USGPO, c1917.

UF481.33
U5 U.S. Dept of the Army. Field Manual/Training Regulation "The Observation Battalion", FM 6-120: 29 Jun '39; 1 May '45; Jul '51; 8 Mar '62. TR 430-130; 10 Sep '32.

UL555
S6U5 U.S. Dept of the Army. Technical Manual, "Sound Ranging Set, GR-8," TM 11-2568: Sep '45.

UL505.45
G3U5 U.S. Dept of the Army. Office of Military History. The Reconnaissance Artillery, Gen. W. Berlin. Tr. of German Docu, ND.

MILITARY PERIODICALS CITED:

<u>LC No.</u>	
UF1 A8	<u>Army Ordnance</u>
UF157.2544 U53	<u>Artillery Information Service Memorandum</u>
UF23.5 F6T2	<u>Artillery Trends (Field Artilleryman)</u>
UF7 F81	<u>Bulletin de Renseignements de l'Artillerie</u>
UF1 C7	<u>Coast Artillery Journal</u>
UF1 F6	<u>Field Artillery Journal</u>
UF1 G7	<u>Gunner</u>
UD7 I5	<u>Infantry School Mailing List</u>
UD7 I5	<u>The Infantry School Quarterly</u>
UF1 W8	<u>Journal of the Royal Artillery</u>
UG1 P8	<u>The Military Engineer</u>
D743 U6	<u>Military Reports on the United Nations</u>
D769 A208	<u>Operations Division Information Bulletin</u>
UG1 P8	<u>Professional Memoirs, Corps of Engineers</u>
UJ1 A7	<u>Signal Corps Bulletin</u>
D743 U52	<u>Tactical and Technical Trends</u>
UF1 U7	<u>United Kingdom Artillery Notes</u>

PERIODICALS, MILITARY

"Accuracy of SRS and FRS Locations, Period Subsequent to St. Mihiel Offensive." Professional Memoirs, Corps of Engineers, 11:384-390, 1919.

"Adjust by Sound." Artillery Trends, p. 28, Jan. 1968.

"Airphibious Employment of Sound Ranging Platoon." Artillery Trends, p. 58, Oct. 1958.

"An Autographic Sounding Machine." M. Meigs, Military Engineer, 14:199-210, 1922.

"Balloon Registration in the German Army." Bulletin de Renseignements de l'Artillerie, 11:59-108, Sep. 1918.

"The Camouflaging of Batteries against Spotting by Sound." Bulletin de Renseignements de l'Artillerie, 10:37-43, Aug. 1918.

"Center-of-Impact or High-Burst Registration by Sound and Flash Ranging Technique." Artillery Trends, p. 21, Feb. 1958.

"Deceptive German Artillery Methods," Tactical and Technical Trends, 33:9-11, 9 Sep, 1943.

"Development of Sound Locators at Frankford Arsenal." Lt. Hiram B. Ely, Army Ordnance, 6:241, 1925-26.

"Ears of the Army." P.R. Bassett, Coast Artillery Journal, 75:200-204, 1932.

"Ears of the Infantry." LT. COL. Patrick B. Watson, Infantry School Quarterly, 36:33-45, Apr. 1950.

"Exercise Cheese Cracker, 94 Loc Regt Sound Rangers in Holland." Gunner, 56:9, July, 1975.

"Extending Accurate Observation, Observation Battalion Term for Target Locating." LT. COL. Edward R. Melton, Field Artillery Journal, 34:709, 710, Oct. 1944.

"The Field Artillery Observation Battalion." Field Artillery Journal, 38:252-257 Nov-Dec, 1948.

"Final Report of Flash and Sound Ranging Service." Professional Memoirs, Corps of Engineers, 11:351-383, 1919.

"Flash and Sound Ranging." MAJ Howard W. Hodgkins, Coast Artillery Journal, 52:41-54, Jan-Apr, 1920.

"Flash Base Observation." LT C. R. Moore, Field Artillery Journal, 34:192, 193, Mar. 1944.

"The Flash Locator." U.K. Artillery Notes, 15:14-15, (1944).

- "Flash Observer Training." Artillery Trends, p. 18, Dec. 1964.
- "Flash, Our Secret Weapon." MAJ W.A. Solf, Field Artillery Journal, 37:170 May-Jun. 1947.
- "Flash-Sound Ranging." MAJ C. Brewer, Field Artillery Journal, 21:345-353 Jul. 1931.
- "Flash-Spotters." "G.B.T." Journal of the Royal Artillery, 64:497-501, 1937-38.
- "German Light Mountain Observation Battalion." Tactical and Technical Trends, 48:12-14, 1 Jul, 1944.
- "German Methods of Fire Regulation." Bulletin de Renseignements de l'Artillerie, 2:71-102, Nov. 1917.
- "How Accurate? Flash Ranging." Artillery Trends, p. 55, Apr. 1963.
- "If Not an Air O.P. Why Not Locating?" Journal of the Royal Artillery, 80:115-123, Apr. 1953.
- "Improved British Flash-Ranging Method." Military Reports on the United Nations, 7:18, 19, 15 Jun. 1943.
- "Listening Devices and Additional Instruments." Drs. Christian vonHofe, and Hans Raaber. Coast Artillery Journal, 75:332-336, 1932.
- "Locating Enemy Missile Firing Positions." Artillery Trends, p. 44, Dec 1959.
- "Metal Mirrors, Night Glasses and Oscillators." Maj. G.B. Robison, Coast Artillery Journal, 74:483, 1931.
- "A Method of Calibrating Guns in Position." Capt. C.H. Bosanquet, Journal of the Royal Artillery, 47:118-120, 1920-21.
- "New Artillery Plotting Kit for Sound Ranging." Artillery Trends, p. 62, Jun. 1958.
- "The New Counterfire Platoon," MAJ Q.L. Gates, Infantry School Quarterly, 42:101-110, Apr. 1953.
- "New Field Manual on Artillery Sound Ranging and Flash Ranging." Artillery Trends, p. 99, Oct. 1957.
- "Note on the Accuracy of Sound Ranging Locations." C.B. Bazzoni, Professional Memoirs, Corps of Engineers, 11:391-421, 1919.
- "Observation Battalion Lessons." Artillery Information Service Memorandum, 3:22-26, Apr. 1944.

"The Present Status of Sub-Aqueous Sound Ranging." MAJ Harvey C. Allen, Coast Artillery Journal, 59:35-55, 1923.

"Radar to Supplement Sound and Flash Ranging." Operations Division Information Bulletin, 2:8, 24 Jun. 1944.

"Ranging Equipment of the U.S. Army." J.B. Cress, The Military Engineer, 12:275-280, 1920.

"Recent Developments in Terrestrial Sound Ranging." MAJ G.B. Robinson, Coast Artillery Journal, 71:292-296, Jul-Dec. 1929.

"Report on Experience of Sound Ranging in East Africa and the Middle East by the Commanding Officer of a Survey Regiment." U.K. Artillery Notes, 5:App. C., Aug. 27, 1943.

"Role and Use of German Artillery Spotting Sections," Bulletin de Renseignements de l'Artillerie, 8:59-76, Jun. 1918.

"Rough But Ready Sound Ranging." LT. V.C. Kennedy, Jr., Field Artillery Journal, 34:46, 47, Jan. 1944.

"Searchlights and Sound Locators." R.E. Gillmor, and P.R. Bassett, Army Ordnance, 10:311-320, 1929-30; 11:418-422, 1930-31; 11:41-47, 1930-31.

"Selecting Sound Locator Personnel." Capt. Gustave E. Lefors, Coast Artillery Journal, 81:377-379, Sep-Oct 1938.

"Sound and Flash." Field Artillery Journal, 33:667, Sep. 1943.

"Sound-Flash Survey." Capt. M. Pierson, Field Artillery Journal, 29:25, Jan. 1939.

"Sound Locating Set, GR-6." Infantry School Mailing List, 29:67-80, Oct. 1946.

"Sound Locations." CAPT. Eugene Maurey, Jr., Field Artillery Journal, 35:73,74 Feb. 1945.

"Sound Locators, Their Functions and Limitations." LT Hiram B. Ely, Coast Artillery Journal, 65:123-131, Jul-Dec. 1926.

"Sound Observation in the Jungle." Lt I.L. Funk, Field Artillery Journal, 34:360-362 Jun. 1944.

"Sound Ranging." LT. W.A. Barnes, Jr. Field Artillery Journal, 34:358, 359 Jun. 1944.

"Sound Ranging-Dead or Alive." Maj Glen Coffman, Field Artillery Journal, 42:19-24, Mar-Apr., 1974.

"Sound Ranging for Mortars." Artillery Information Service Memorandum, 6:15-19, 4 Sep. 1944.

- "Sound Ranging in Korea." Maj K.F. Stott, Journal of the Royal Artillery, 82:54-61, Jan. 1955.
- "Sound Ranging Results by Calculation." Ober. Faber, Field Artillery Journal, 30:139, Mar. 1940.
- "Sound Ranging Tests." Field Artillery Journal, 42:24 Mar-Apr. 1974.
- "Stop-Watch Location of Hostile Batteries and Adjustment of Fire." MAJ B.H. McCurdy, Field Artillery Journal, 34:362, 363, Jun. 1944.
- "A Story of Locating." COL. K.A.M. Bennett, Journal of the Royal Artillery, 93:93-96, Spring, 1966.
- "Subaqueous Sound Ranging." LT R.W. Raynsford, Signal Corps Bulletin, 33:18-25, 1926.
- "Suggested Method for Locating Hidden Guns by Sound." LT F.L. Corry, Journal of the Royal Artillery, 41:829, 1914-15.
- "The Survey Problem Now and in the Future." Journal of the Royal Artillery, 78:101-109, Apr. 1951.
- "Survey Work in Modern War." Maj. M.N. MacLeod GB, Journal of the Royal Artillery, 48:190-202, 1921-22.
- "Tactical Employment of the Observation Battalion." Maj. H.C. Jones, Field Artillery Journal, 19:359-369, Jul. 1929.
- "Training the Searchlight-Sound Locator Team." Capt. John L. Goff, Coast Artillery Journal, 79:121-123, Mar-Apr. 1936.
- "War Experiences of a Detail Man." Cpl Crane, Field Artillery Journal, 32:45, Jan. 1942.
- "We Cover the Corps Front." Capt. A.F. Freund, Field Artillery Journal, 27:279-284, Jul-Aug., 1937.
- "The Weapon Locating Scene." Maj. D.A. Wilcox, Journal of the Royal Artillery, 93:130-134, Sep. 1970.
- "Zones of Silence in Sound Areas from Explosives." Charles E. Munroe, Professional Memoirs, Corps of Engineers, 10:253-260, 1918.

SPECIAL BIBLIOGRAPHIES
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The following numbers are available in paper copy format from the National Technical Information Service, 5285 Port Royal Rd., Springfield, VA 22161, for prices indicated.

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