Firepower: Lessons from the Great War

Seminar 11
Western Front: Breaching the Hindenburg Line

Montbrehain: Artillery Tactics, Techniques and Procedures

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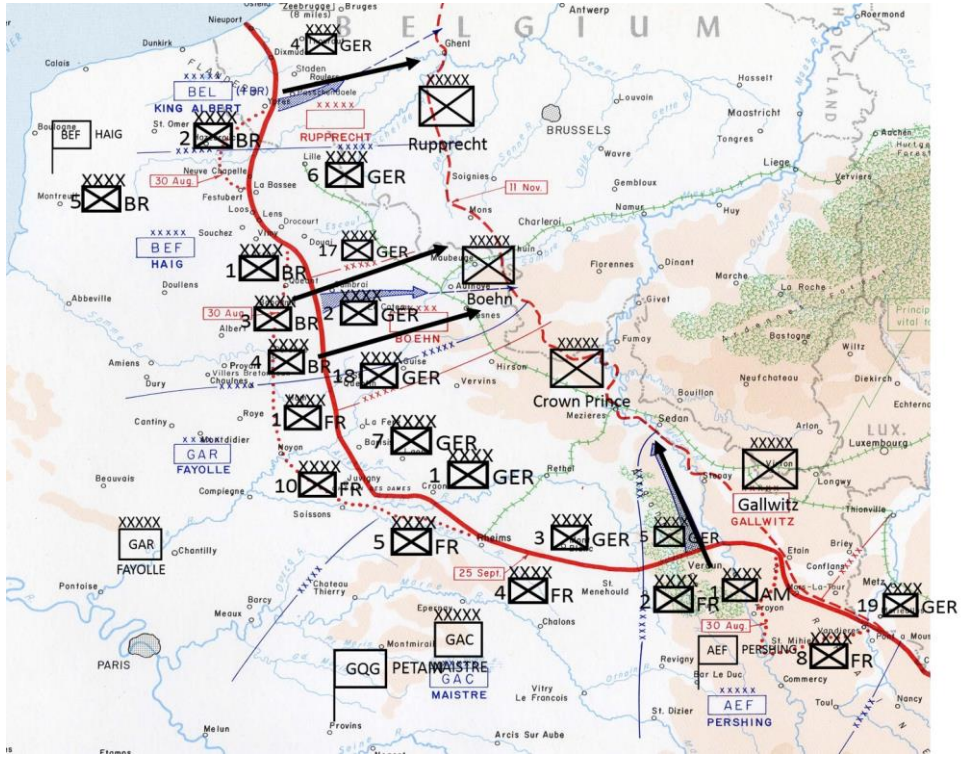
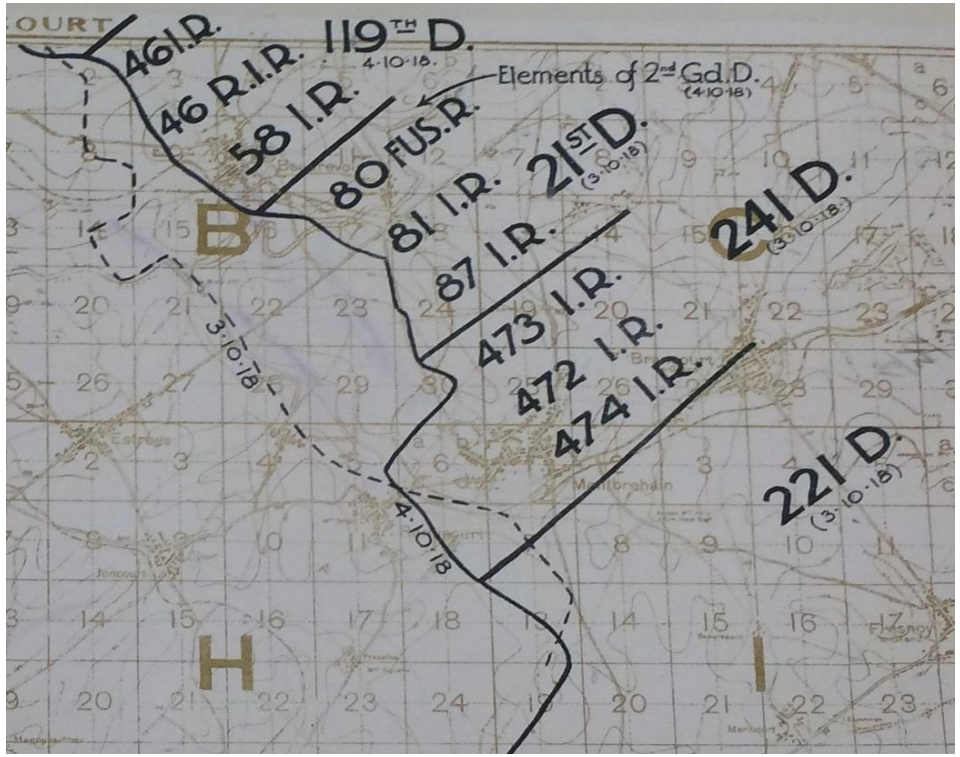
Montbrehain: strategic context

Allied offensive: 26 September 1918



https://www.usma.edu/history/SiteAssets/SitePages/World%20War%20I/WWOne23.jpg

Fourth Army: 4 October



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Solving the gunnery problem: 1918

Component	How achieved
Know location of firing unit	**Survey (Plane Table Resection or Astronomical observations)** **Bearing Picket (BP) to lay for line** **Mapping** Field laying
Determine Location of the Target	**Flash Spotting (FS)** **Sound Ranging Sections (SRS)** **Artillery Observation Posts (OP)** **Forward Observation Officers (FOO)** **Aerial Observation** **Compilation of Intelligence (CBSO)**
Determine Vertical Interval and Site	**Mapping** **Survey**
Compensate for nonstandard conditions	**Meteor** Variations in shell weights Tactics, techniques and procedures (TTP)
Convert Chart Data to firing data	TTP **Calibration** **Battery Board**
Apply firing data to weapons	TTP Crew drills

Solving gunnery problem = predicted fire

Solving the gunnery problem: survey and mapping

Techniques

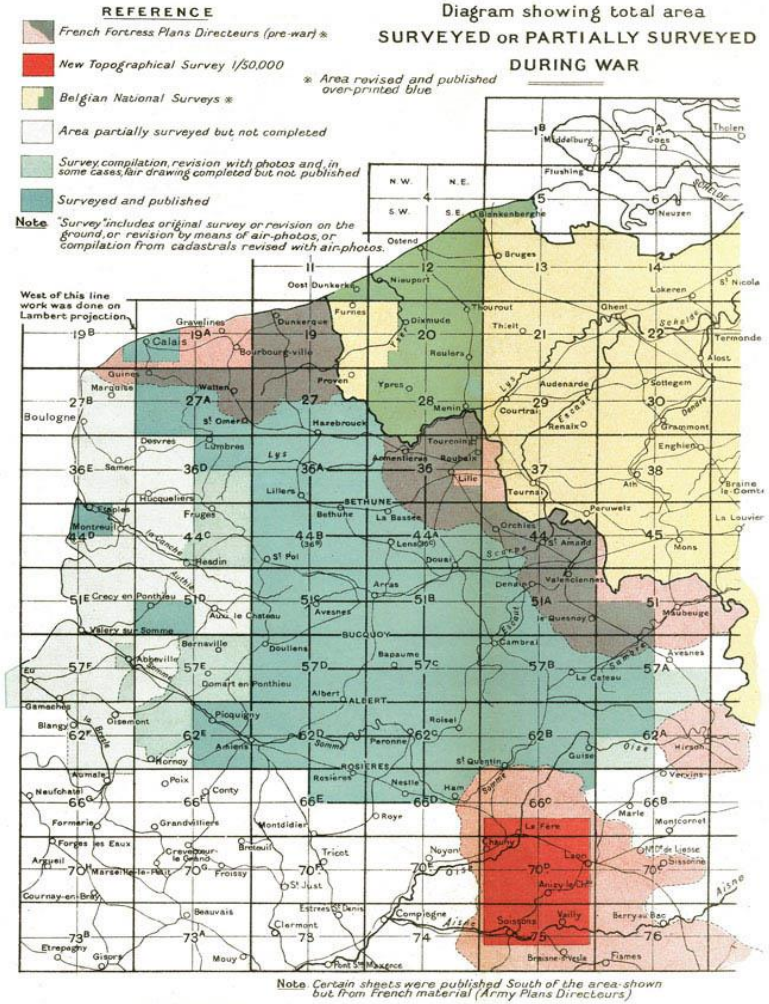
- Accurate mapping from trigonometrical framework
- Battery survey (artillery board, plane table resection and BP)
- Rectification of aerial photos
- Fix location: SRS microphones and Observation Group posts

Field Survey Companies (1916) and Battalions (1918)

- Topo and Map Sections
- FS and SRS Groups
- Compilation Office: Location arbiter for Hostile Batteries (HB) – army level

Corps Topo Sections (1917):

- Battery survey
- Map production and distribution



http://www.defencesurveyors.org.uk/Images/Historical/WWI/Western%20Front%20image%20area%20surveyed.jpg

Solving the gunnery problem: sound ranging

Characteristics

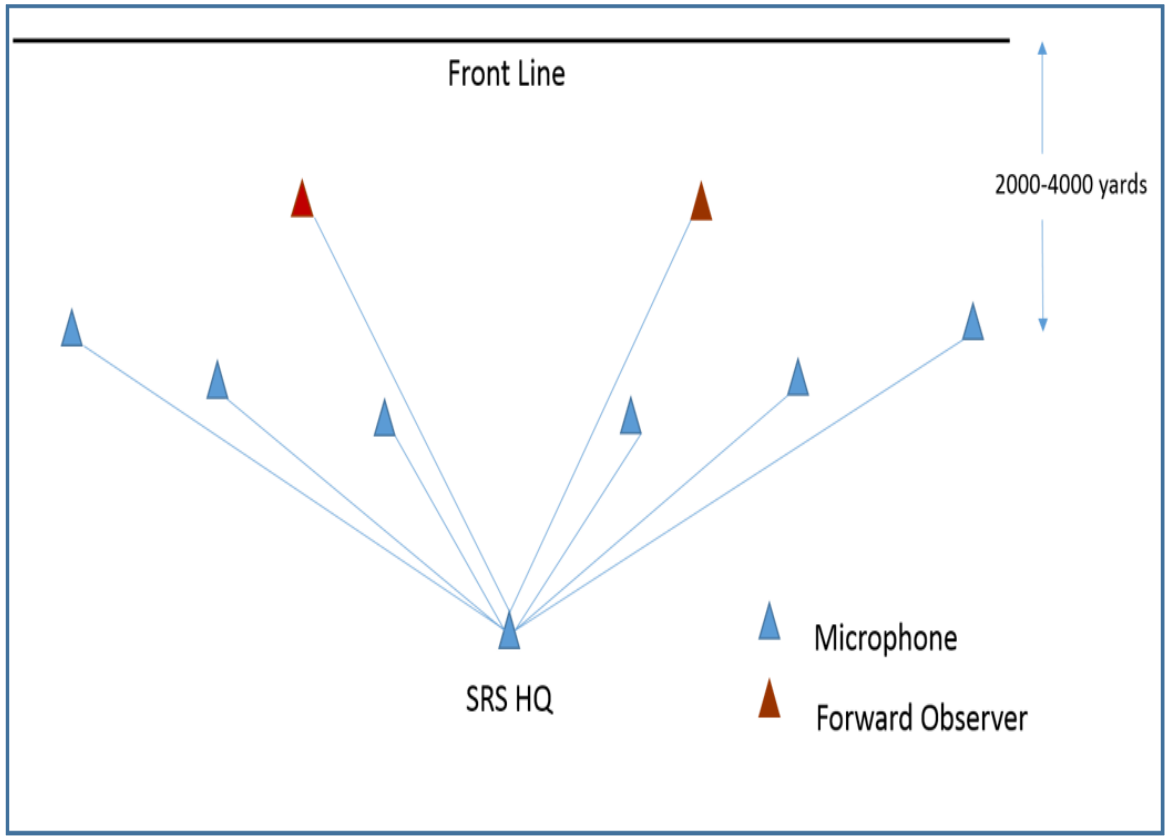
- 1400-1800 yards between microphones
- 7000-9000 yard base
- Detection distance ≈ 12,000 yards
- 25 yard accuracy with multiple observations

Strengths

- Works in fog and rain
- Can determine calibre and target of HB
- Can be used for ranging

Limitations

- Slow emplacement time (36-48 hours 1918)
- Fails when wind blowing toward enemy guns
- Large reliance on cable (40 miles)



Solving the gunnery problem: observation groups

Characteristics

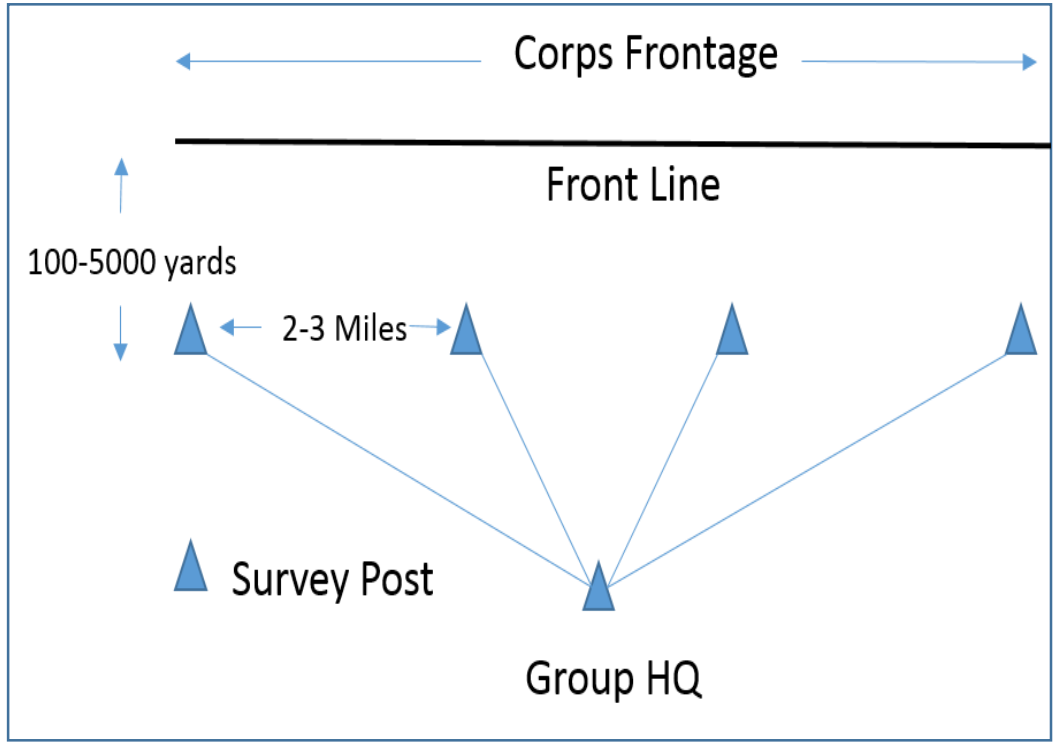
- 3-4 posts per corps frontage (overlapping)
- Group HQ has flash and sound buzzer to coordinate spotting
- Terrain and view dictated placement

Strengths

- Good accuracy
- Also use for ranging
- Relatively quick emplacement (5-8 hours 1918)

Limitations

- Posts out of touch with group HQ were ineffective
- Dummy flashes could fool observers
- High degree of training needed



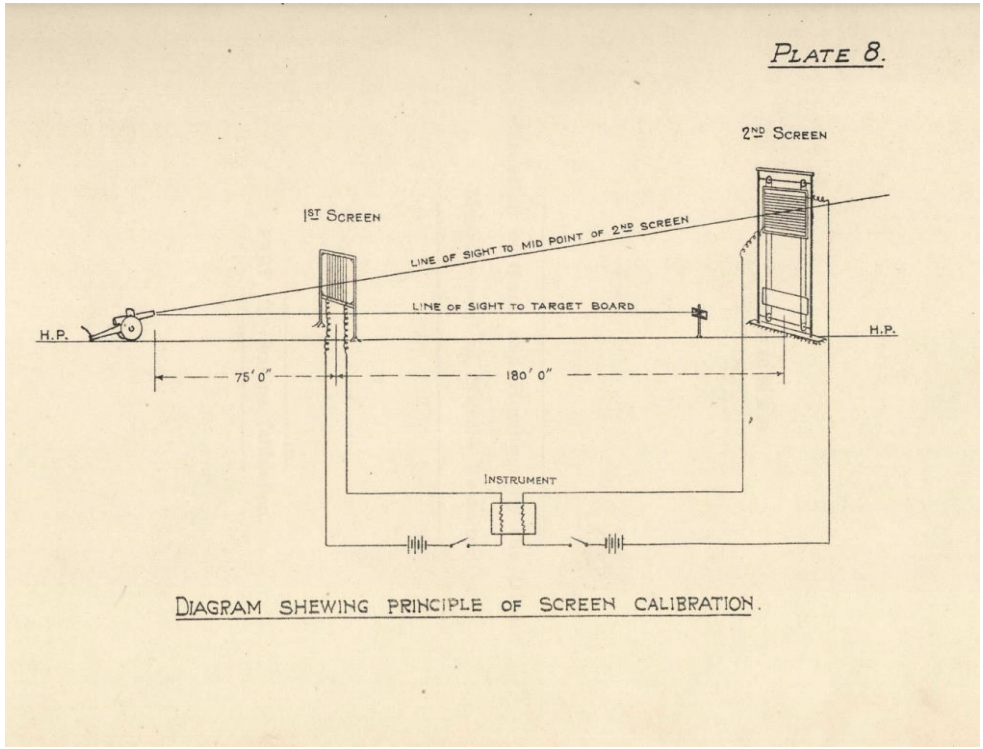
Solving the gunnery problem: calibration and meteor

Calibration

- Bull sound ranging apparatus
- Calibrates 6 guns at once; One division of field artillery per day
- Measured Muzzle Velocity (MV), jump and droop
- Part of field survey battalion

Meteor

- August 1918: 7x telegrams per day
- time of flight, air temperature, wind
- Barometer at Mean Sea Level (MSL)
- Sent from GHQ



NAA A1194, 17.14/8761 A Treatise by Major Chapman, R. H. on the calibration of Guns and Howitzers

Solving the gunnery problem: Royal Air Force

Corps wing – 1 squadron per corps

- 3 Flights (6 aircraft each: A, B, C)
- A artillery, B counterattack, C infantry
- Photo reconnaissance (tactical and mapping)
- Facilitated destructive and neutralisation shoots
- Limited by weather and communications

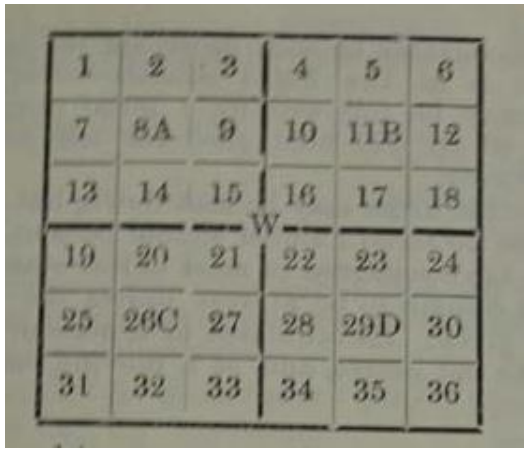
Balloon wing – 1 Company per corps

- 4-5 per company. Artillery observation and ranging

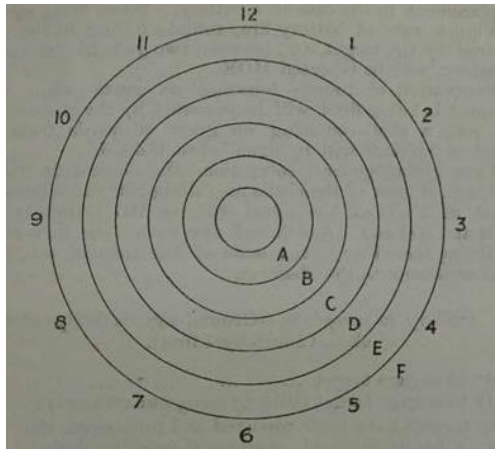
Army wing – 6 squadrons per wing

- Fighting scouts and bombers. Air superiority

Zone call square



Clock code



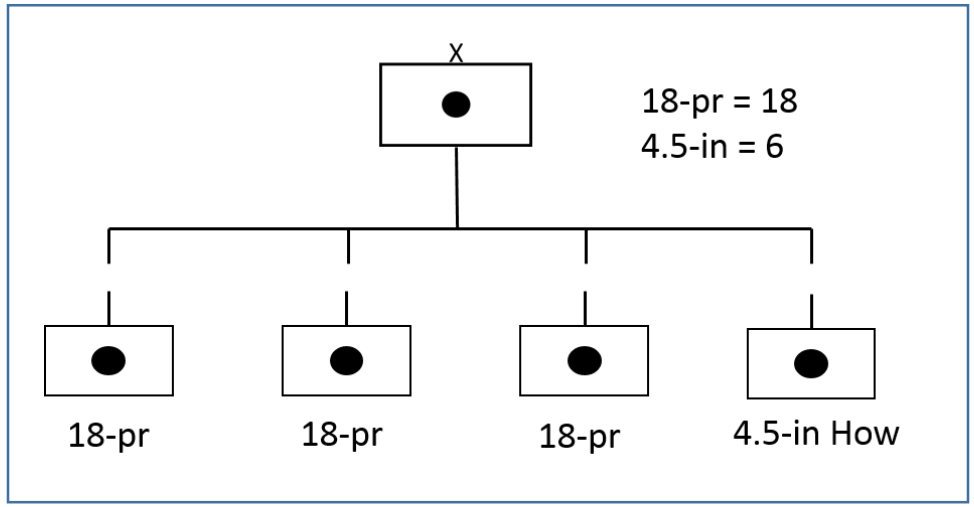
SS 131 Co-operation of Aircraft with artillery December 1916

Wireless Calls

NF = Guns firing
GF = Fire for effect (fleeting opportunity)
LL = All available guns open fire (favourable target)
CIB = Central Information Bureau (clearinghouse for reporting enemy aircraft and movement)

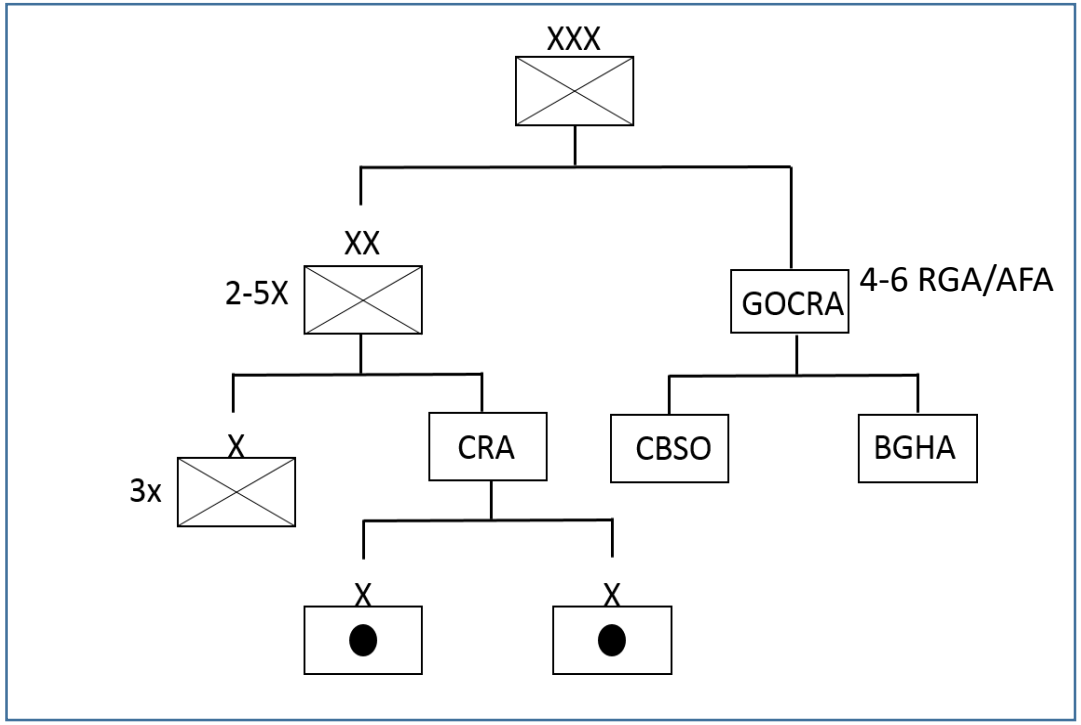
Solving the gunnery problem: artillery organisation

Field Artillery Brigade (FAB)



GOCRA: General Officer Commanding, Royal Artillery
BGHA: Brigadier General, Commanding Corps Heavy Artillery
CBSO: Counterbattery Staff Officer
CRA: Commander, Royal Artillery
AFA: Army Field Artillery or Australian Field Artillery

Artillery Chain of Command



Solving the gunnery problem: artillery intelligence and counter battery

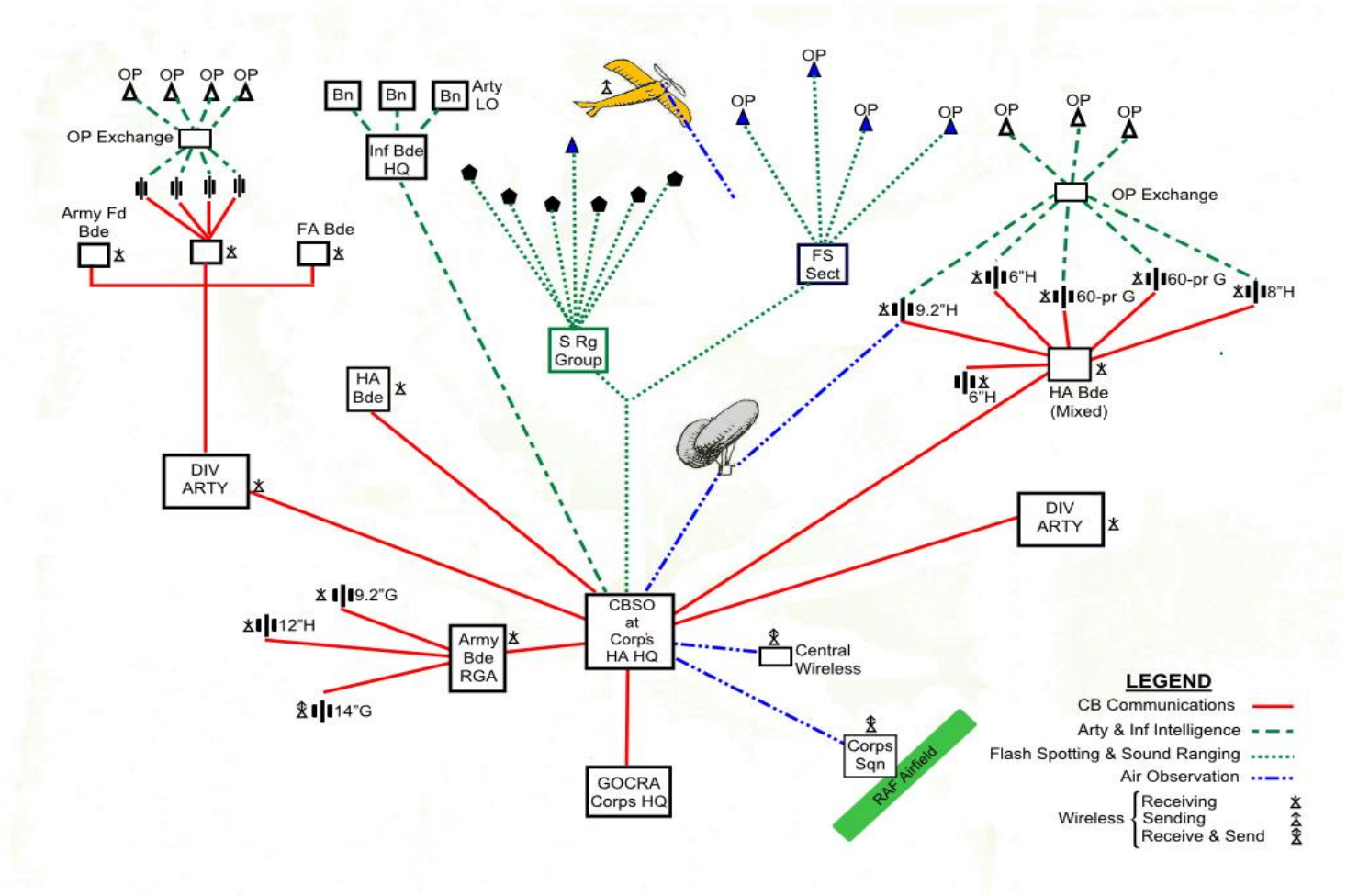
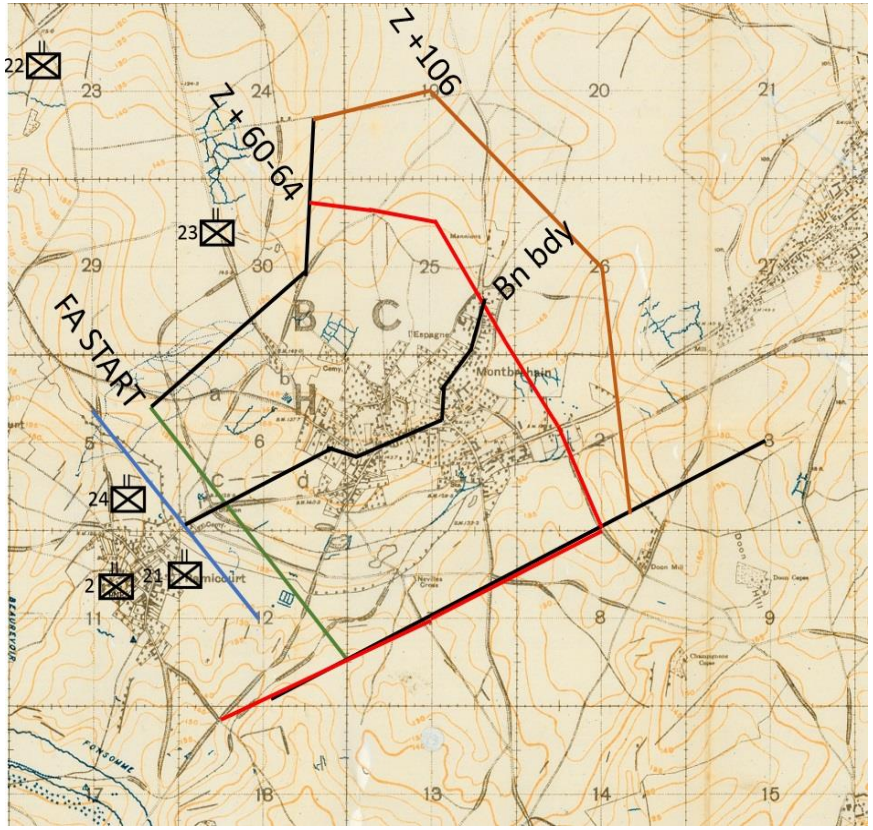
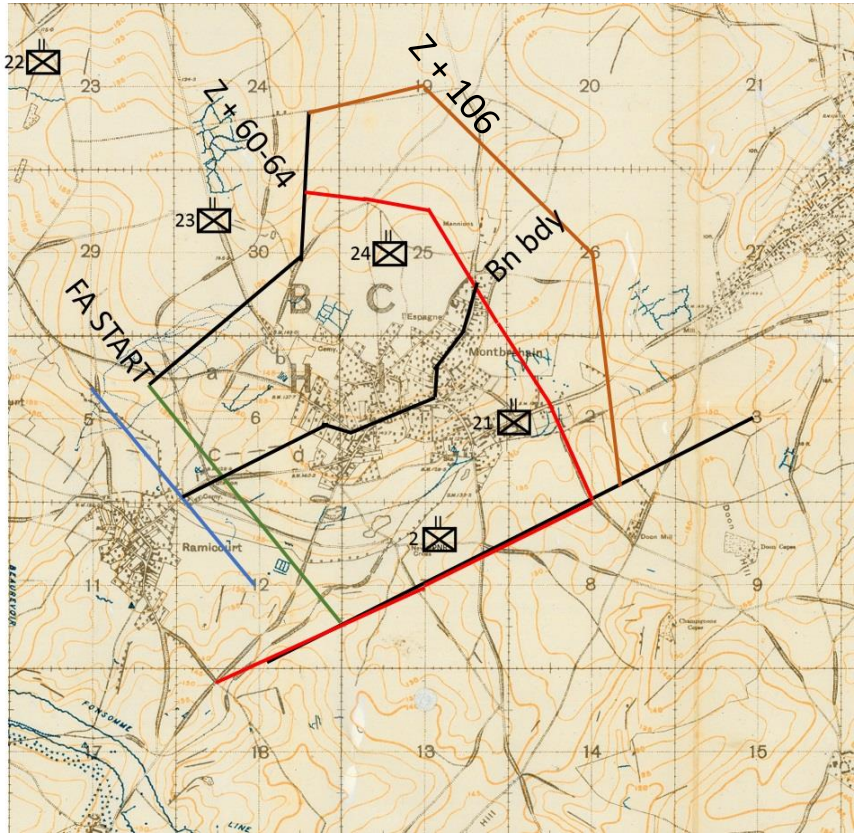


Image courtesy Nigel F Evans. British artillery in World War 2. nigelef.tripod.com/p_artyint-cb.htm

Montbrehain: attack positions and objectives



16th Tank Bn with 12 Tanks supporting attack
21 and 24 Bn ≈ 300 men in 3 Companies
2nd Pioneer Bn ≈ 600 men in 4 Companies
1 Stokes Mortar and 2 Vickers Machine Guns per Bn



Blue line = Infantry forming up line
Red line = Objective line
Brown line = Protective barrage line
Black lines = Boundary lines
Green line = Field artillery start line

Montbrehain: artillery organisation

Field artillery – CRA 2nd Division: Brigadier Phillips

- 144 18-pr and 48 4.5-in How (war establishment)
- 118 18-pr and 42 4.5-in How available
- Left Group: 4th, 5th FAB; 6th, 12th Army Bde AFA
- Right Group: 10th, 11th, 13th, 14th FAB

Heavy artillery - BGHA Australian Corps: Brigadier Fraser and CBSO Lt-Col Cummins

- 201 on establishment, 165 available, 108 in range
- Counterbattery Group: 93rd, 41st, 9th, 71st, 51st (60-pr)
- Bombardment Group: 68th, 18th, 51st (-60-pr)
- 73rd Army Brigade RGA: army control. Rear area harassing fire and counter battery

Brigade	Type	Guns in range
93rd	Mixed	8x 60-pr; 12x 6-in How
41st	Mobile	8x 60-pr; 8x 6-in How
9th	Mobile	8x 60-pr; 8x 6-in How
71st	8-in How	16x 6-in How
51st	Mixed	7x 60-pr; 11 6-in How
68th	8-in How	6x 6-in How
18th	9.2-in How	6x 6-in How
73rd	Army Brigade	9x 6-in Gun; 1x 14-in Gun

Type	Batteries	Guns
Mobile	2x 60-pr, 2x 6-in How	24
Howitzer	3x 6-in How, 1x 8-in or 9.2-in How	20-22
Mixed	2x 60-pr, 2x 6-in How, 1x 8-in How, 1x 9.2-in How	36
73rd Army Brigade	3x 6-in Gun, 1x 12-in How, 1x 14-in Railway Gun	15

Montbrehain: creeping barrage and bombardment

Liaison and FOO

- Each Group: liaison to Bns, 1 FOO
- Left Group: liaison 6th Bde

Ammunition

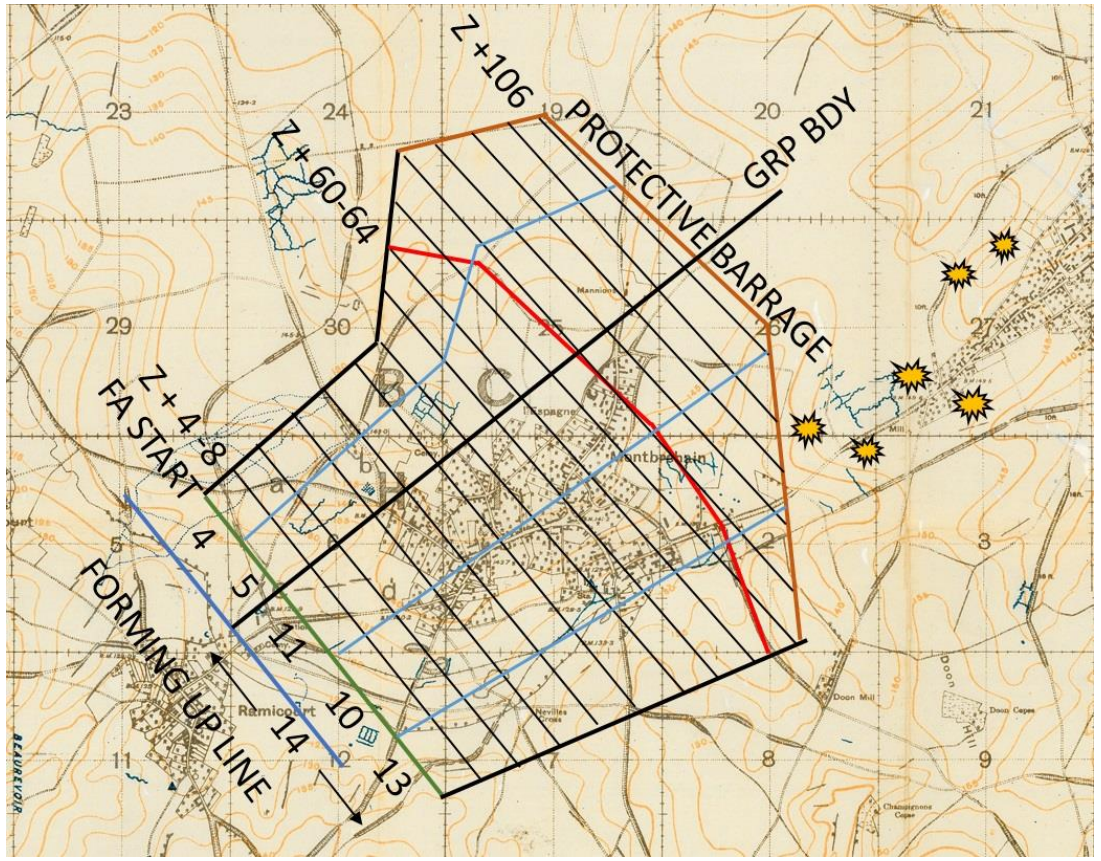
- 18-pr: 50% shrapnel, 50% HE. 1 rd. smoke (first 6 lifts); HE in village
- 4.5-in How: no restrictions. Fire within village only

GF and LL Calls

- 2 superimposed batteries per group

Rate of fire (rds per gun per minute)

From	To	18-pr	4.5-in How
Zero	Objective: Zero plus 64-84	2	1
Objective	Zero Plus 90	1	½
Zero Plus 90	Zero plus 120	½	½



Bombardment target: 6th and 12th Brigades

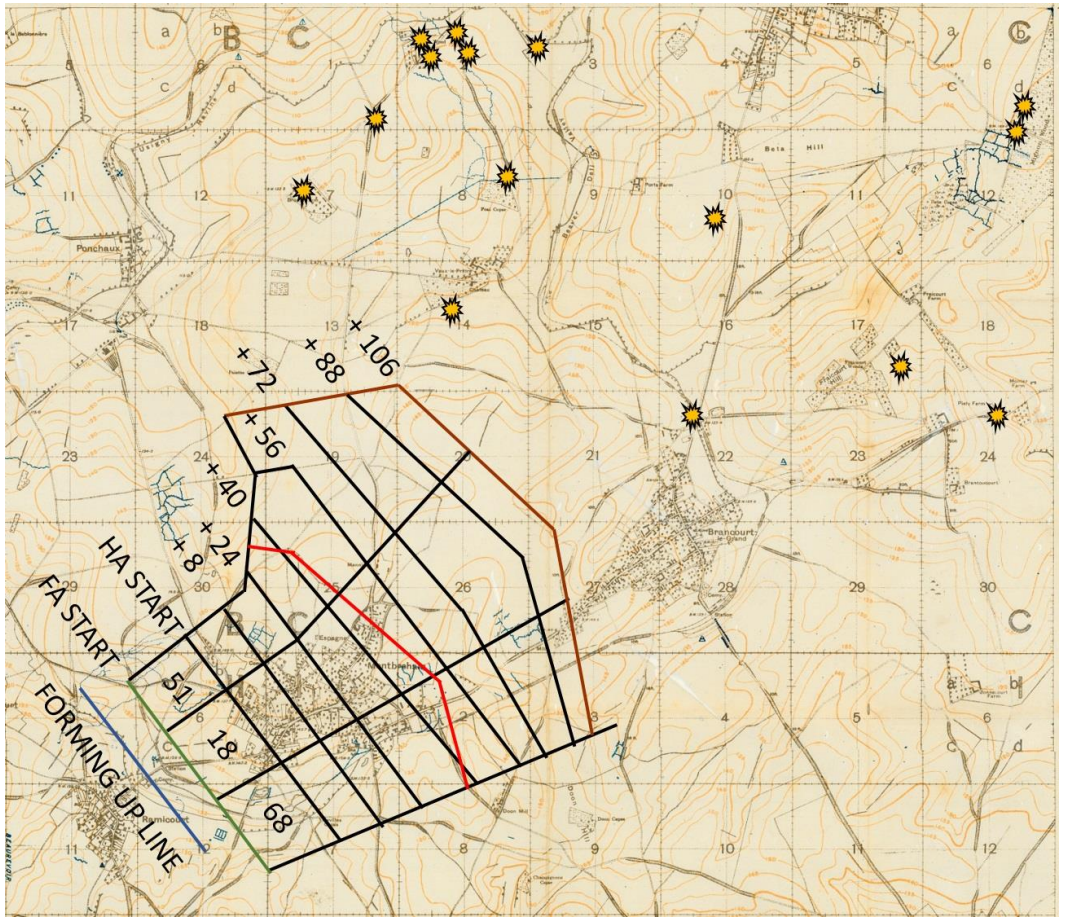
Montbrehain: heavy artillery bombardment and counter battery

Bombardment: 21 6-in How

- Fire until Z + 106
- Bdes engage fleeting targets when possible
- HE fires 75% 106 fuze, delay fuze for concrete structures and dugouts (village)
- Times show lift from the zone west of line

Counter battery: 31 60-pr, 44 6-in How

- 17 Hostile battery areas
- Engaged by section of 6-in How or 60-pr
- Fire until Z + 110 minutes
- Brigades detach sections to answer NF calls



Hostile battery areas under counter battery fire

Montbrehain: conduct of attack

Initial attack

- Objective reached right, tough fighting left
- Barrage reported ragged and short
- German counter barrage tracks infantry

German counterattack

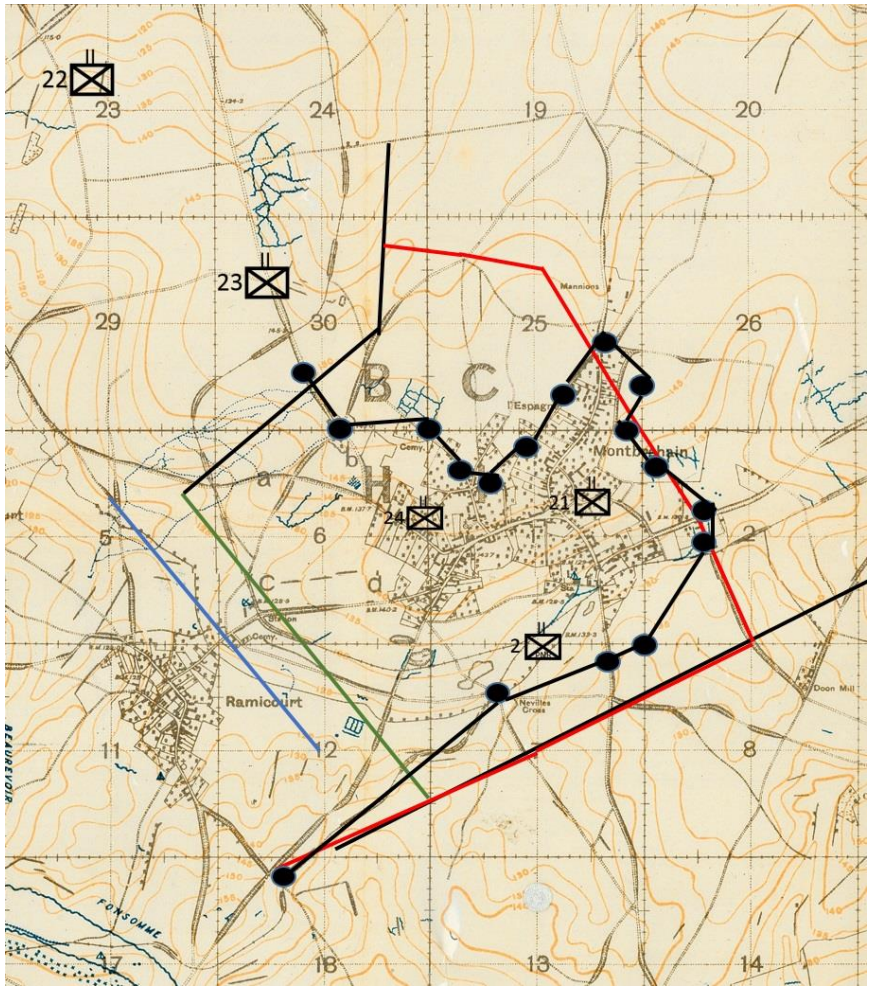
- Pushes Bns 400 yards into village
- Artillery fire disperses troops Doon Mill and north village

Consolidation

- 21 Bn and 24 Bn edge of village, 2nd Pioneer defensive flank
- 18 and 27 Bn reinforced and provided carrying parties

Aftermath

- Casualties - 6th Brigade 400; FA 46; RGA 8
- 12 Officers, 594 OR taken prisoner



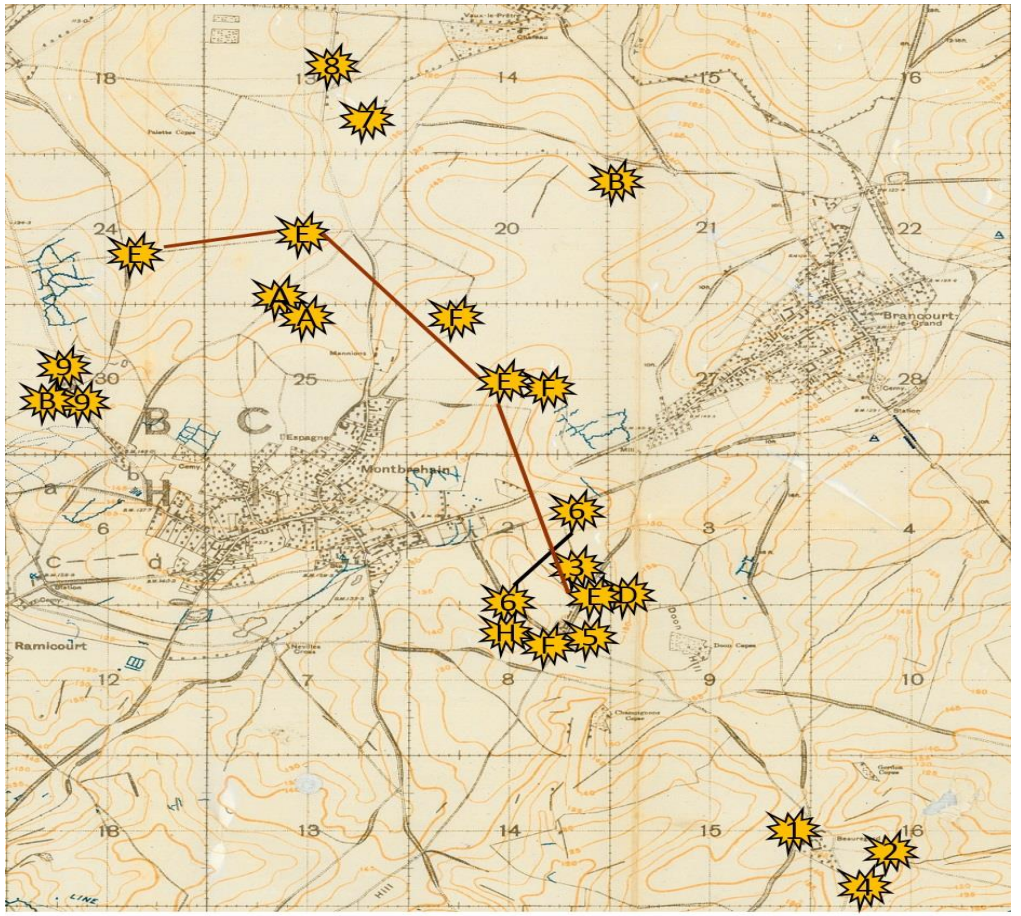
Montbrehain: field artillery supporting fire

4TH AFA BRIGADE

ID	TIME	TYPE	RDS
1	0807	NF	50 18-pr
2	0819	NF	50 18-pr
3	1100	NF	50 18-pr
4	1118	NF	50 18-pr
5	1130	FOO (MG Doon Mill)	100 18-pr; 200 4.5-in How
6	1210	GROUP (Prot. Barrage)	100-120 18-pr; 4.5 in How
7	1336	GF (HT)	20 18-pr
8	1402	GF (100 Infantry)	50 18-pr
9	1440	FOO (Infantry)	150 18-pr; 150 4.5-in How
A	1450	Bty OP (infantry)	150 18-pr; 100 4.5-in How
B	1500	Group	UNK
C	1530	LL (4 Guns C.7.d.8.3)	200 18-pr

11TH AFA BRIGADE

ID	TIME	TYPE	RDS
D	0900	GROUP VIA FOO (Troops near Doon Mill)	UNK
E	UNK	Infantry (continue protective fire) 1005-1130	UNK
F	1100	FOO (infantry movement)	100 4.5-in How
G	UNK	GROUP (harassing fire)	UNK
H	1500	FOO (infantry movement)	100 4.5-in How



- Rounds detailed in War Diary. Not complete record of expenditure for brigade
- 21,125 18-pr and 4959 4.5-in How fired total for Field Artillery

Solving the gunnery problem: Montbrehain

Know location of firing unit and Determine vertical interval and site

- Most batteries displaced 4 October
- Battery boards, BP and resection not available
- Mapping: current maps and photos available
- Batteries laid in by map, compass, aiming posts and director
- Vertical interval determined by map and director

Determine location of target

- SRS not in action due to speed of advance
- Observation groups in action
- Aerial observation primary target location
- FOO and Artillery OP secondary method

Compensate for non-standard conditions

- Meteor: wind, temperature, barometer used

Convert Chart Data to firing data

- Battery boards: not available
- Calibration: obtain MV, jump and droop

Solving the gunnery problem: conclusions

Survey and intelligence functions

- Optimised for static warfare
- Battery survey (BP, artillery board, resection)
- CBSO intel collection and compilation
- Mapping improvements from 1914

Mobility

- Improvement over 1917 but still limitations

Aerial Observation

- Crucial for target location, mapping and ranging
- Lack of wireless telephony (radio)

Infantry-Artillery Cooperation

- Liaison
- Lack of wireless telephony (radio)

Montbrehain from Doon Mill, photo by author