

The German Radar Stations at the Pointe Du Raz (FR)

Giancarlo T. Tomezzoli

Etno-Archaeological Observatory, Munich, Germany

Email: gt21949@gmx.de

How to cite this paper: Tomezzoli, G. T. (2021). The German Radar Stations at the Pointe Du Raz (FR). *Archaeological Discovery*, 9, 198-222.

<https://doi.org/10.4236/ad.2021.93011>

Received: June 23, 2021

Accepted: July 27, 2021

Published: July 30, 2021

Copyright © 2021 by author(s) and Scientific Research Publishing Inc.

This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

Because of its extension in the Atlantic Ocean, the Pointe du Raz, at the extremity of Brittany, was always an ideal place for signalisation and surveillance. For this reason, lighthouses and semaphores were activated. In the thirties of the last century, the Pointe experienced a period of prosperity that led to the construction of several hotels. It was because of the rapid German occupation of France in 1940 that the situation at the Pointe changed radically. A 2 km² surface from the Pointe to Lescoff was requisitioned for the construction of the *Stps QU 300*, *QU 500* and *QU 13* hosting sophisticated radar stations. Various German units took turns ensuring the defence and the operations at the Pointe. On 8th August 1944, the garrison evacuated after having set on fire and destroyed military and civilian installations. The visits on 3rd January 2005 and 14th August 2020 permitted to identify many *Stp* components and to determine their preservation state at about 75 years after the conclusion of WWII.

Keywords

WW II, Brittany, Pointe Du Raz, Radar Stations, *QU 300*, *QU 500*, Renntier, *QU 13*, Radar *Mammut*

1. Introduction

Because of its extension in the Atlantic Ocean, the Pointe du Raz, at the extremity of Brittany, was always an ideal place for signalisation and surveillance. For this reason, on 1838-1839 a lighthouse was erected and from 15th May 1839, it delivered a first order white light. In 1881 the lighthouse was completed with guardian lodgements and on 15 September 1887, it was deactivated to let place on the sea to La Vieille lighthouse. In October 1892, it was adapted to semaphore for optical signalisation operated by the French Marine Nationale (C'Est en

France, 2020).

In the thirties of the last century, the Pointe experienced a period of prosperity that led to the construction of several hotels to lodge multitudes of visitors fascinated by its wild nature and superb panoramic visions.

It was because of the rapid German occupation of France in 1940 that the peaceful situation at the Pointe changed radically.

2. History

From 15 August 1940 up to January 1941, the semaphore was occupied by a detachment of a battery of the 12th Artillery Observation Group, followed up to February 1941 by a detachment of the 6./*Bataillon 151* of the *Infanterie-Division 61*.

A 2 km² surface from the Pointe to Lescoff was requisitioned for the construction of radar stations (Blanchard, 2014, 2021, 2021a). The works were directed by the Organization Todt (O.T.) and the *Luftwaffefeldbauamt 7*. A Decauville line and trucks through the Route Nationale transported materials, sand and Ero Vili pebbles (Tomezzoli & Marzin, 2015) for its construction. 250 - 300 French workers were daily in service at the Pointe.

On 17th mars 1941 a *Focke Wulf 200 Condor* of the 2./*Kampfgeschwader 40*, in the fog, crashed on a hamlet of Lescoff causing no civilian victims but killing three of its five crew members (Floch, 2012).

On 1st May 1941, the semaphore was reactivated by the 01 512G unit of the Brest Admiralty Transmission Service.

At the end of 1941 the 25./*Luftgau-Nachrichten-Regiment 12* operated a *Freya* and a *Würzburg 39T* near Lescoff, in provisional, non-concrete emplacements (Blanchard, 2021a).

In 1942 the semaphore was occupied by the 01 512W unit of the *Marine-Wetterwarte* Brest.

The *Stp. QU 300*, unit 01 512F, near the semaphore, *Kriegsmarine* operated, was equipped initially by 1 × *Würzburg 39G* (Blanchard, 2021a; Le Berre, 2020), replaced on 1942 by 1 × *Freya SeeTakt G41g 310 FuMO 2 Calais B* and 1 × *FuMO 214 Würzburg-See-Riese* (Blanchard, 2021a; Lippmann, 2021; Danzé et al., 2017) operated by a detachment of the 1.*Komp.* and parts of the 31.*Komp.* of the *Marine-Funkmeß-Abteilung 3*, and by four *Flak* emplacements for light machine guns.

The *Stp. QU 500* coded *Renntier* (Reindeer), at Roz-Bestree in the middle of the Pointe, *Luftwaffe* operated, was equipped with 2 × *FuSE 65 Würzburg-Riese* and 1 × *FuSE 80 Freya* (Blanchard, 2021a; Lippmann, 2021; Danzé et al., 2017), this last replaced later by 1 × *FuMG-401 Freya-LZ* and 1 × *FuSE 62D* (Lippmann, 2021). Initially, *QU 500* was operated by a detachment of the 16./*Luftgau-Nachrichten-Regiment 7*, unit *L38 089*, up to December 1940. During 1941, it was operated by a detachment of the 8./34 *Luftnachrichten-Regiment*, unit *L08 470*.

On the spring 1943, the *Stp. QU 13*, at Men Tan near Lescoff, *Luftwaffe* operated, was equipped with 1 × *Mammut Frederick FuMG 41/42* (Danzé et al., 2017) or 1 × *Mammut Caesar FuMG 41 G (cF)* (Lippmann, 2021), 1 × *FuSE 62A* on mobile carriage (Danzé et al., 2017) (Lippmann, 2021) and 1 × *FuMG 450 Freya* (Lippmann, 2021).

QU 500 and *QU 13* were operated by a detachment of the *25./Luftgau-Nachricht-Regiment 12*, unit *L42 432*. On April 1943 the *Regiment* became the *Flugmelde-Leit-Kompanie 54* and its *12.Komp.*, unit *L55 178*, was at the Pointe.

The security of the *Stps* was assured by *2. Artillerie-Batterie* of the *Flak-Gruppe 752*, unit *L31 782*, the *Landeschützen-Zug der Luftwaffe 66/IV*, unit *L08 889*, as well as by mine fields.

An electrical factory, a water reservoir, shacks, canteens, an infirmary and a cinema projecting a new film each week were in exercise at the Pointe.

A section of the *6./Regiment 894*, unit *58,135C*, assumed the Pointe defence from July to October 1943. In June 1944 the defence of the coast comprising the Pointe was assumed by the *343. Infanterie Division*. The *4./Regiment 898*, unit *59,130E*, assumed the Pointe defence from 5th July 1944. A section of the *3./II. Ostbataillon (Mitte)*, unit *36,989*, was at the Pointe. The *9./Festung-Stammtruppen XXV* was at the Pointe coastal sector.

On 8th August 1944, the garrison evacuated the Pointe after having set on fire and destroyed military and civilian installations and ended up encircled in the pouch of Lezongar until it surrendered on 20th September 1944 (Floch, 2012).

3. The Visits

The visits on 3rd January 2005 and 14th August 2020 permitted to identify many components of *Qu 300*, *Qu 500* and *Qu 13* (Figure 1).

3.1. Qu 300

The *Qu 300* identified components (Figure 2 and Figure 3) were the following.

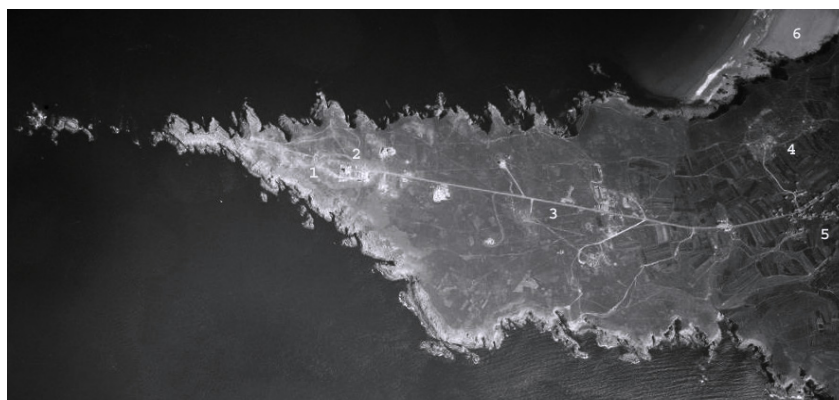


Figure 1. *Stps* at the Pointe du Raz—1 *Qu 300*; 2 semaphore; 3 *Qu 500*—Roz Bestrée; 4 *Qu 13*—Men Tan; 5 Lescoff; 6 Baie des Trépassés. [Geoportail] Image C0319-0061_1952_F0319-0819_0074, n°74, 1/26347, Argentine, 24/05/1952.



Figure 2. *Qu 300*—1 semaphore; 2 *Würzburg* and *Freya* emplacements; 3 Notre Dame des Naufragés monument; 4 gun emplacement; 5 shacks; 6 possible Flak emplacement; 7 hotels; 8 shacks; 9 reservoir/pool; 10 possible *R622*; 11 - 12 shacks; 13 heap of debris; 14 access road. [Geoportail] Image C0319-0061_1952_F0319-0819_0074, n°74, 1/26347, Argentine, 24/05/1952.



(a)



(b)



(c)

Figure 3. (a) Semaphore (1); (b) Details of the base of the 1875 headlight; (c) Gun emplacement.

The semaphore ($48^{\circ}2'11.31''N$, $4^{\circ}44'16.38''W$, height 69.45 m) (1). Its 44×44 m stone enclosure, the quadrangular tower and the building leaning against, destroyed by the garrison, were well reconstructed. The *Flak* emplacement at the

top of the tower disappeared replaced by a modern white structure equipped with antennas. Recent constructions replaced ancient constructions at the sides of the stone enclosure. The semaphore is still operated by the Marine Nationale.

The base of a metal sheet 1875 headlight ($48^{\circ}2'20.65''\text{N}$, $4^{\circ}44'9.82''\text{W}$, h. 30.63 m) (3) 200 m west from the semaphore, used as 37 mm Flak gun emplacement (Danzé et al., 2017). Formed by two converging stone walls and a circular emplacement filled with stones. Its reconstructed structure was in good preservation state.

The hotels (6), near the semaphore used as garrison lodgements, the antenna and buildings of the French Marine Nationale transmission station north of the semaphore, two French 95 mm 1888 Lahitolle guns and their supports installed west of the semaphore, the chapel near the Notre Dame des Naufragés monument (2), the shacks (7 - 8, 10 - 12), the water reservoir/pool (9), the heap of debris (13), the *FuMO 214 Würzburg-See-Riese* and its support, installed west to the semaphore, on a round stone platform, probably built by the Marine Nationale (Blanchart, 2021), dynamited by the garrison (Danzé et al., 2017) and the square, brick shelter of the *Freya SeeTakt G 41g 310 FuMO 2 Calais B*, dynamited by the garrison (Danzé et al., 2017), disappeared because of after war interventions devoted to restoring the Pointe wild nature.

3.2. Qu 500

The *Qu 500* identified components (Figures 4-9) were the following.

An *L 479 Anton* ($48^{\circ}2'18.24''\text{N}$, $4^{\circ}43'5.86''\text{W}$, h. 69.16 m) (1) (Appendix Figure A1 and Figure A2) for night-fighter control, similar to those of *LA 318*



Figure 4. *Qu 500*—1 *L 479 Anton*; 2 *L 486*, 3 *Vf 61a*; 4 - 5 shack ditches; 6 square bunker; 7 shacks; 8 *V 229*; 8a square excavation; 9 possible bunker; 10 *Flak* emplacement and *R 655*; 11 *V 229*; 12 *R 622*; 13 excavation; 14 shack ditch; 15 infirmary shack ditch; 16 possible *Flak* emplacement; 17 *L 410 A*; 18-19 shack ditches; 20 *Freya* emplacement; 21 shack ditch; 22 *L 409 A*; 23 *RS 58c*; 24 open cistern; 25 buried bunker. [Geoportail] Image C0319-0061_1952_F0319-0819_0074, n°74, 1/26347, Argentique, 24/05/1952.



Figure 5. V 229 (8): (a) General view; (b) Upper side and interior, on the right fixation point for *Würzburg-Riese*.

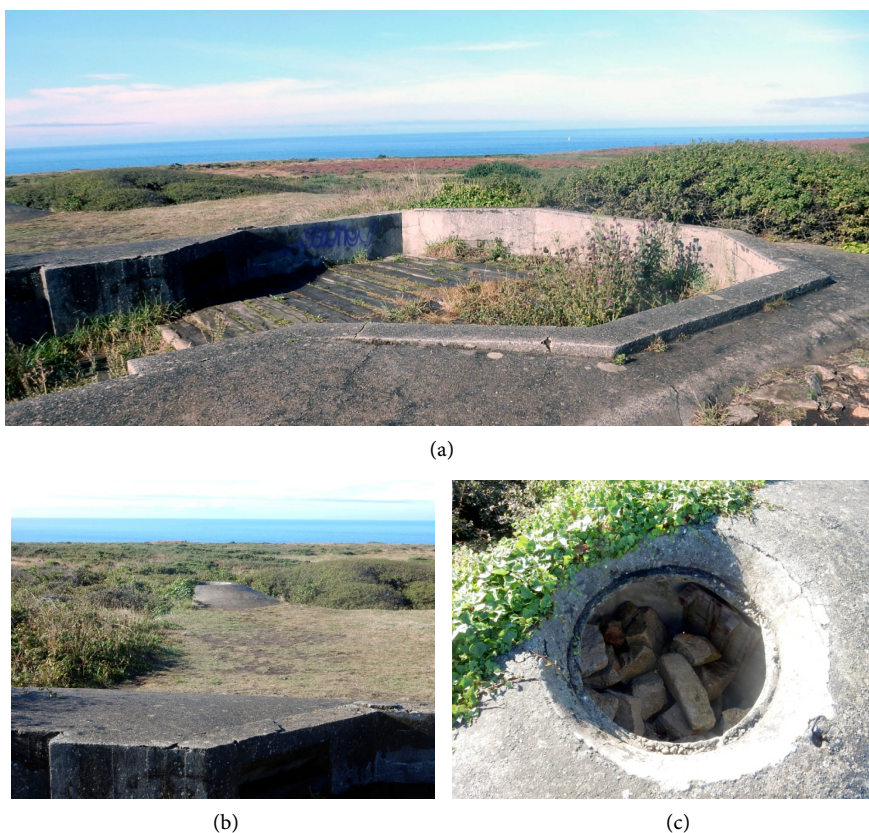


Figure 6. (a) Octagonal Flak emplacement (10); (b) R 655, observation post; (c) Observation post interior.

Frosch at Cap Fréhel (Tomezzoli & Moser, 2021), of *Re 510 Pinguin* at Saint-Pabu-Le Bous (Tomezzoli & Colliou, 2017, 2018) and of Saint-Jacques de la Lande (Dupont et al., 2007). The terrain and vegetation coverage precluded access to the entrances and the interior. The emerging portion appeared in good preservation state.

A 9×9 m square bunker ($48^{\circ}2'16.55''\text{N}$, $4^{\circ}43'54.24''\text{W}$, h. 66.7 m) (6) buried in the terrain, for energy production (Danzé et al., 2017). The concrete coverage, emerging from the terrain, was in good preservation state.



(a)



(b)



(c)



(d)

Figure 7. *R 622 (12)*: (a) Façade, access trench and personnel entrances; (b) Access trench and external observation post; (c) Entrance ladder with close combat room louver; (d) Gaslock.



(a)



(b)

Figure 8. *L 410 A (17)*: (a) Gun emplacement, on the background *Freya* emplacement; (b) Concrete gun support with intrusions.

A 16×13 m ditch ($48^{\circ}2'14.06''\text{N}$, $4^{\circ}43'10.31''\text{W}$, h. 67.15 m) (15) now part of the Maison de la Pointe du Raz et du Cap Sizun, hosting the rests of an infirmary shack used nowadays as exhibition centre. Its east side was provided with two



(a)



(b)



(c)

Figure 9. Cylindrical stone construction (20): (a) Labyrinth personnel entrance; (b) Material entrance and double protection wall; (c) Loopholes and collapsed portions of the protection wall on the terrain.

access ladders. Its concrete structure was in good preservation state. The ditch entrance was closed so that the preservation state of the shack was not be ascertained.

A *V* 229 (48°2'22.15"N, 4°43'26.61"W, h. 69.26 m) (8). The interior was invaded by vegetation. On the upper side were the traces of the *Würzburg-Riese* supporting elements. The concrete structure was in good preservation state.

A square 6 × 6 m degraded excavation (48°2'24.51"N, 4°43'26.46"W, h. 59.33 m) (8a), 0.5 m deep, 70 m north of the *V* 229, for a *Flak* gun.

An octagonal, 6 m in diam. *Flak* emplacement (48°2'15.46"N, 4°43'24.02"N, h. 74.2 m) (10), 0.5 m deep for a 2.0/3.7 cm *Flak* gun. Wooden boards covered the floor. The concrete structure was in good preservation state. It was leaning against an *R* 655 buried in the terrain, with external observation post filled with stones. Its emerging concrete structure was in good preservation state.

A *V* 229 (48°2'14.35"N, 4°43'22"W, h. 73.83 m) (11). The internal floor was filled with stones. On the internal walls two recesses for shelves or equipments. On the upper side metallic fixation bolts and the traces of the corresponding *Würzburg-Riese* supporting elements. On the walls, pebbles of the EroVili (Tomezzoli & Marzin, 2015) mixed with concrete. The concrete structure was in good preservation state.

An *R* 622 (48°2'12.76"N, 4°43'20.76"W, h. 73.18 m) (12) (Appendix Figure A7) with observation post and access trench. The two entrances gave access to

ladders and to the interior which preserved the original wall white painting and rusted ceilings. All the internal furniture disappeared. The concrete structure was in good preservation state.

A degraded excavation (48°2'11.71"N, 4°43'27.13"W, h. 66.35 m) (13) probably for one or more shacks, formed by a 15 × 10 m portion joined to a 27 × 12 m portion, about 2 m deep.

An *L 410 A* (48°2'10.57"N, 4°43'8.29"W, h. 70.27 m) (17) (**Appendix Figure A3**) (Tomezzoli & Colliou, 2017) buried in the terrain, only the external octagonal *Flak* emplacement emerged. At the access, in the concrete, the vertical grooves for the wood closure, on the sidewalls, ammunition niches, at the centre a 3.5 m in diam. circular support for a 2.0/3.7 cm *Flak* gun. On the support the Ero Vili pebbles, around its centre a circular alignment of eight square intrusions and near the circumference four other rectangular disposed intrusions. On one external side the rests of a 30 cm in diam. chimney. The entrances buried in the terrain prevented the inspection of the interior. The *Flak* emplacement was in good preservation state.

A 6.20 in diam., 2.40 m high (Blanchard, 2021), cylindrical stone construction (48°2'19.78"N, 4°43'8.32"W, h. 69.03 m) (20) as a Middle Ages one, for *Freya*, similar to that of *LA 318* (Tomezzoli & Moser, 2021). It comprised a double external wall provided with personnel, labyrinth entrance and a material entrance. The *Freya* cabin and its antenna were inside and because no lodgement was foreseen, the personnel lodged in the nearby shacks. Recently restored, its structure was in good preservation state, although some portions of the external wall collapsed perhaps because of the explosion of an English bomb on 9th July 1944 (Danzé et al., 2017).

An *L 409 A* (48°2'9.27"N, 4°43'5.14"W, h. 67.06 m) (22) (**Appendix Figure A4**) buried in the terrain, only the octagonal emplacement for a 2.0/3.7 cm *Flak* gun emerged. The dense vegetation prevented access to the personnel entrances for the interior inspection and to the gun emplacement. The visible portions were in good preservation state, notwithstanding a minor damage at the entrance of the emplacement letting visible Ero Vili pebbles mixed with the concrete.

An *RS 58c* (48°2'10.26"N, 4°43'6.17"W, h. 67.19) (23) at the south west corner of the modern parking, at 35 m from the *L 409 A* (22) connected to it by an access trench. The portion emerging from the vegetation was in good preservation state.

A 2 × 1 m open cistern (48°2'19.78"N, 4°43'54.24"W, h. 69.32 m) (24) at the south west corner of the parking, at 50 m from the *L 409 A* (22) and at 15 m from the *RS 58c* (23), similar to those observed at *Be-2* at Mont Saint Michel de Braspart (Tomezzoli & Dupont, 2011) and at *La 318* (Tomezzoli & Moser, 2021). The dense vegetation prevented to reach it for determining its preservation state.

A 7 × 9 bunker (48°2'8.49"N, 4°43'8.15"W, h. 67.93) (25) buried in the terrain. The emerging coverage was in good preservation state. The entrances buried in the terrain prevented the inspection of the interior.

An *L 486* (48°2'17.62"N, 4°43'4.43"W, h. 69.46) (2) was completely buried in the terrain, a *Vf 61a* (48°2'17.79"N, 4°43'1.92"W, h. 70.75) (3) for a mortar was still visible, the shack ditches (4 - 5, 7, 14, 18 - 19, 21) disappeared; a possible bunker (9) was buried in the terrain; a possible *Flak* emplacement (16) was not identified.

3.3. *Qu 13*

The *Qu 13* identified components (**Figures 10-16**) were the following.



Figure 10. *Qu 13*—1 *L 485*(1); 2 *R 667*; 3 *Vf 2a*; 4 *R 622*; 5 kitchen and canteen ditch; 6 *Vf 1b*; 7 possible bunker; 8 *Vf 1b* “abri tolle metro”; 9 *Vf 2a*; 10 *RS 58c*; 11 Lescoff. [Geoportail] Image C0319-0041_1961_F0319-0519P_0055, n°55, 1/25710, Argentique, 21/06/1961.



(a)



(b)



(c)

Figure 11. *L 485* (I) (1): (a) General view, on the left the pylons and the west antenna support, on the right the chimney; (b) West antenna support; (c) Emergency exit pit.



(a)



(b)



(c)



(d)



(e)

Figure 12. *L 485 (I)* (1): (a) Inclined concrete ramp; (b) Entrances, on the left loophole of the close combat room; (c) Gaslock; (d) Close combat room with loophole metallic plate; (e) Compensator room and workshop, left and right entrances to the antenna rooms, rusted ceiling.

An *L 485 (I)* ($48^{\circ}2'26.01''\text{N}$, $4^{\circ}42'40.16''\text{W}$, h. 76.47 m) (1) (**Appendix Figure A5** and **Figure A6**) for *Mammut* radar, oriented north-west south-east, partly buried in the terrain. Mainly built in concrete, some portions were in bricks or stones. Rests of a bitumen layer on the coverage, indicated that it was provided with an insulation system. Two 3×2 m rectangular pylons for the descent of antenna cables, disfigured by modern graffiti, but in good preservation state and a 1×1 m chimney protruded from the coverage. The antenna supports between the pylons were buried in the terrain. An east and west 3×2 m antenna support,



Figure 13. (a) *R 667* (2) inclined rear side; (b) *R 667* (2) front side, combat room opening and protective wing; (c) *Vf 2a* (3), coverage with protective wall.



Figure 14. (a) Second 3×3 m constructions; (b) Third 3×3 m construction (c) Possible *Flak* emplacement.



Figure 15. (a) *Vf 1b*, in the background second and third 3×3 m constructions; (b) *RS 58c* near *Vf 1b*, circular opening of the combat room.



Figure 16. (a) *Vf 1b* “abri tôle de metro” general view (11); (b) Internal room with window and rusted curved ceiling; (c) *RS 58c* (10).

at the exterior of the pylons, emerged from the terrain, letting visible bricks, the bitumen layer, four metallic antenna portions fixed to a rectangular metallic fixing frame embedded in the concrete. On the north side, a 2×1 m open cistern covered by vegetation and on the east side a 2×2 stone pit of an emergency exit. On the west side, a concrete inclined ramp led to the entrances protected by the loophole of a close combat room. The internal rooms preserved the original white wall painting, somewhere disfigured by modern graffiti, and severely rusted ceilings. All the internal furniture disappeared and the floors were clut-

tered by terrain and stones not collapsed from the walls. The close combat room preserved the metallic plate of its loophole. The workshop and compensator rooms formed a unique room. On its floor were traces of the compensator support. All the metallic doors, cables, technical instrumentations and furniture disappeared. After war images show that the *Mammut* antenna disappeared before 1948, after its fall to the ground.

A *R 667* (48°2'25.31"N, 4°40'35"W, h. 75.41 m) (2) (**Appendix Figure A8**) for a 5 cm KwK (*Kampfwagenkanone*) gun. The entrance, in the inclined rear side, introduced in the combat room which preserved walls disfigured by contemporary graffiti, an ammunition niche on the floor and a rusted ceiling. All the internal furniture disappeared and on the floor, the gun emplacement was covered by stones. The front side hosted the combat room front aperture and a protective wing. The concrete structure was in good preservation state, letting visible Ero-Vili pebbles mixed with concrete and formwork element traces.

A *Vf 2a* (48°2'27.67"N, 4°42'41.85"W, h. 71.96 m) (3) for a projector (**Danzé et al., 2017**). The coverage, emerging from the terrain, was limited by a protection wall formed by stones and concrete. On the west side, two pits were covered by vegetation. Terrain and vegetation covering the access trench and the entrance prevented the inspection of the interior. The coverage and the protective wall were in good preservation state.

An *R 622* (48°2'27.26"N, 4°42'37.02"W, h. 77.42 m) (4) (**Appendix Figure A7**) for two groups of ten soldiers (**Rudi, 1988**) 32 m north-east from the *L 485(I)*. Dense vegetation invaded the coverage, the access trench and obstructed the entrances; therefore its preservation state was not ascertained.

A first 3 × 3 m construction (48°2'26.43"N, 4°42'37.32"W, h. 77.59 m) provided with access trench. Completely covered by vegetation, its purpose and preservation state was not ascertained.

A second 3 × 3 m construction (48°2'26.71"N, 4°42'36.5"W, h. 77.82 m) partially covered by vegetation. It was one of the two stone emerging structures of a kitchen and canteen ditch (5). The visible stone portion was in good preservation state.

A third 3 × 3 m construction (48°2'27.32"N, 4°42'35.38"W, h. 78.01 m) covered by vegetation. It was one of the two emerging structures of a kitchen and canteen ditch (5). Completely covered by vegetation, its preservation state was not ascertained.

A 40 × 10 m kitchen and canteen ditch (48°2'26.86"N, 4°42'35.78"W, h. 78.12 m) (5) completely filled by terrain and vegetation. It was provided with an access ladder on each short side. Only its rectangular outline was discernible on the terrain.

A *Vf 1b* (48°2'24.25"N, 4°42'35.3"W, h. 78.48 m) (6) for servants of two disappeared nearby *Flak* emplacements, buried in the terrain, only its rectangular coverage emerged. The entrance buried in the terrain prevented the inspection of the interior. The coverage was in good preservation state, notwithstanding a 3 cm wide fissure crossing its width, caused by an architectural failure.

A *RS 58c* (48°2'25.18"N, 4°42'35.23"W, h. 78.62 m) 5 m south to the *Vf 1b* (6) for the *Q 13* south defence. Covered by terrain and vegetation, only the well preserved circular opening of the combat room was visible.

A possible, 0.5 m deep *Flak* emplacement (48°2'26.57"N, 4°42'38.1"W, h. 78.29 m) 12 m south-east from the *L 485(1)*. Covered by moss and vegetation, appeared in a degraded preservation state.

A bunker (48°2'25.74"N, 4°42'31.84"W, h. 79.35 m) (7) 25 m north from the *L 485(1)* provided with access trench. Completely covered by terrain and vegetation, its type and preservation state was not ascertained.

A *RS 58c* (48°2'27.46"N, 4°42'39.41"W, h. 75.69 m) 10 m west from said bunker, for the *Q 13* north and west defence. The vegetation obstructed its access trench so that its preservation state was not ascertained.

A *Vf 1b* (48°2'27.86"N, 4°42'30.78"W, h. 79.13 m) (8) for personnel lodgment, partially covered by vegetation. Rests of a bitumen layer on the coverage, indicated that it was provided with an insulation system. An access trench led to one of the entrances and the internal room was provided with a window, preserving the original white wall painting and a curved rusted ceiling hence the name underground sheet shelter ("abri tôle de metro"). All the internal furniture disappeared. Its structure was in good preservation state.

A *Vf 2a* (48°2'28.59"N, 4°42'32.2"W, h. 79.65 m) (9) for personnel lodgment, buried in the terrain, only its rectangular coverage, in good preservation state, emerged. The vegetation covering the access trench and the entrance prevented the inspection of the interior.

A *RS 58c* (48°2'27.91"N, 4°42'29.72"W, h. 79.34 m) (10) 10 m south-east from the *Vf 1b*, for the *Q 13* east defence. Partially covered by vegetation, it appeared in good preservation state.

4. Discussion

The Pointe radar stations repeat the same dual organisation of the radar station *LA 318* (Tomezzoli & Moser, 2021) and *RE 510* (Tomezzoli & Colliou, 2017) consisting in separated radar stations operated respectively by the *Kriegsmarine* and the *Luftwaffe*. They repeat also the same architecture of *La 318*, *Re 510*, the radar station *Mandrill* at Monterfil (Dupont et al., 2007) and the radar station *Made* at Les Mées (Tomezzoli & Pottier, 2015) consisting of two *Freya* and two *Würzburg-Riese*. These radars were necessary for assuring continue surveillance also in case of maintenance or malfunctioning of one of them. *Freya* was an early warning phased array radar detecting aircrafts up to 200 km but unable to determine their altitude. *Würzburg-Riese*, often coupled to an IFF (Identification Friend Foe) device, was a near field warning radar detecting aircrafts up to 70 km, their azimuth and their altitude. *Mammut* was a phased array, early warning radar able to detect aircrafts up to 300 km in two directions perpendicular to its rectangular antenna, but blind in a range of 60° on the antenna sides, designed to strengthen the surveillance capabilities of the radar stations. The reasons for

which the *L 485 (1)* was selected for the *Mammut* instead of an *L 485 (2)* as at *La 318* are unknown. Therefore, incoming aircrafts were first intercepted by the *Mammut*, after by the *Freya* and at the end by the *Würzburg-Riese* which, in case of foe aircrafts, provided data for directing the fire of the Flak emplacements. Indicated as unusable on a 1944 map made by an anonymous French informant probably working at the Pointe (Danzé et al., 2017), the *Mammut* was of limited or no surveillance effectiveness.

The eight shack ditches at the Pointe, also of considerable dimensions, offered more personnel safety, with respect to the six at the *Stp* at Menez Hom (Tomezzoli, 2017), the only one at *LA 318* and no one at *RE 500*. All the shacks disappeared before 1948. Probably they were disassembled and rebuilt elsewhere as lodgements for the homeless French population (Tomezzoli, 2019).

The garrison was rather numerous. In 1944, at *Qu 300* and *Q 500* there were 130 soldiers and 3 officers from Austria and Germany and at *Qu 13 70 Luftwaffe* and 20 *Heer* soldiers, between which 7 were from Poland (Danzé et al., 2017).

5. Conclusion

Different after-war interventions on the Pointe have been conducted in order to eliminate hotels, parking, and civilian constructions, and to restore its wild nature so as to elevate it at the rank of Grand Site de France. This is certainly a commendable effort, but up to now no effort at all has been made for documenting and preserving its involved military patrimony.

Acknowledgements

The author is grateful to Mr. Fleuridas P. for his permission to insert in the Appendices the plans of the *L 479 Anton*, *L 410 A*, *L 409 A*, *L 485*, *R 622* and *R 667*, to Mr. Blanchard Y. for his explanations and to Mr. Floch A. for his permission of acquiring information concerning the Pointe during the WWII from his book.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

References

- Blanchard, Y., & van Genderen, P. (2014). A German Radar Chain facing the British Home Chain during the WWII. *2014 11th European Radar Conference*, Rome, Italy, 8-10 October 2014. <https://doi.org/10.1109/EuRAD.2014.6991199>
- Blanchard, Y. (2021). *Radar allemands de la Seconde Guerre: Les (bonnes) surprises de l'archéologie de terrain*. http://www.bunkers-saint-pabu.fr/wordpress/wp-content/uploads/2016/12/ARTICLE_YVES-BLANCHARD.pdf
- Blanchard, Y. (2021a). *Manuscrit YB. Préparé pour l'ouvrage collectif "L'oeil de l'Atlantique"*.
- C'Est en France (2020). *Sémaphore de la Pointe du Raz (Phare du bec de Raz)*.

- <http://www.cestenfrance.fr/semaphore-de-la-pointe-du-raz-phare-du-bec-de-raz/>
- Danzé, J., Le Berre, A., Le Bour, S., Morvan, J., & Schavvinski, B. (2017). *L'œil de l'Atlantique*. Imprimerie du Commerce.
- Dupont, P. H., Fresil, Y., & Tomezzoli, G. (2007). Deutsche Militärbauten bei Rennes. *DAWA Nachrichten*, 49, 56-66.
- Farcy, O. (2012) *Intérêt pour les chiroptères des bunkers de la Pointe du Raz à Plogoff*. Bretagne Vivante. SEPNB-Société Protection Nature Bretagne.
<https://docplayer.fr/72654806-Interet-pour-les-chiropteres-des-bunkers-de-la-pointe-du-raz-a-plogoff.html>
- Floch, A. (2012). *L'Occupation Allemande dans les 141 Communes du Sud-Finistère*. Cloître.
- Le Berre, A. (2020). *Les installations radar allemandes de la pointe du Raz et leur environnement historique*. <https://polejeanmoulin.com/page27/>
- Lippmann, H. (2021). *Funkmeß(ortungs)stellungen in Frankreich*. Bretagne West mit Brest.
http://www.atlantikwall.info/radar/france/rf_.htm#Bretagne_West
- Rudi, R. (1998). *Typologie du Mur de l'Atlantique*. Beetsterzwaag.
- Tomezzoli, G., & Dupont, P. H. (2011). Die Drehfunkfeueranlage Bernhard auf dem Mont Saint Michel de Brasparts. *DAWA Nachrichten*, 57, 4-15.
- Tomezzoli, G., & Marzin, Y. (2015). The Ero Vili and the Atlantic Wall. *Advances in Anthropology*, 5, 183-204. <https://doi.org/10.4236/aa.2015.54018>
- Tomezzoli, G., & Pottier, L. (2015). Die deutschen militärlogistischen Anlagen westlich von Mamers. *DAWA Nachrichten*, 65, 14-27.
- Tomezzoli, G. T. (2017). The WW II German Stützpunkt on the Menez-Hom (Finistère-FR). *Archaeological Discovery*, 5, 224-237.
<https://doi.org/10.4236/ad.2017.54013>
- Tomezzoli, G. T., & Colliou, S. (2017). The WW II Saint-Pabu German Radar Camp and the Stützpunkte Re 03, Re 04. *Archaeological Discovery*, 5, 142-162.
<https://doi.org/10.4236/ad.2017.53009>
- Tomezzoli, G. T., & Colliou, S. (2018). The WW II Saint-Pabu German Radar Camp-2. *Archaeological Discovery*, 6, 88-102. <https://doi.org/10.4236/ad.2018.62006>
- Tomezzoli, G. T. (2019). The BDU West between WWII and Cold War. *Archaeological Discovery*, 7, 1-19. <https://doi.org/10.4236/ad.2019.71001>
- Tomezzoli, G. T., & Moser, J. -L. (2021). The German Radar Station La 318 Frosch. *Archaeological Discovery*, 9, 113-134. <https://doi.org/10.4236/ad.2021.92006>

Appendices

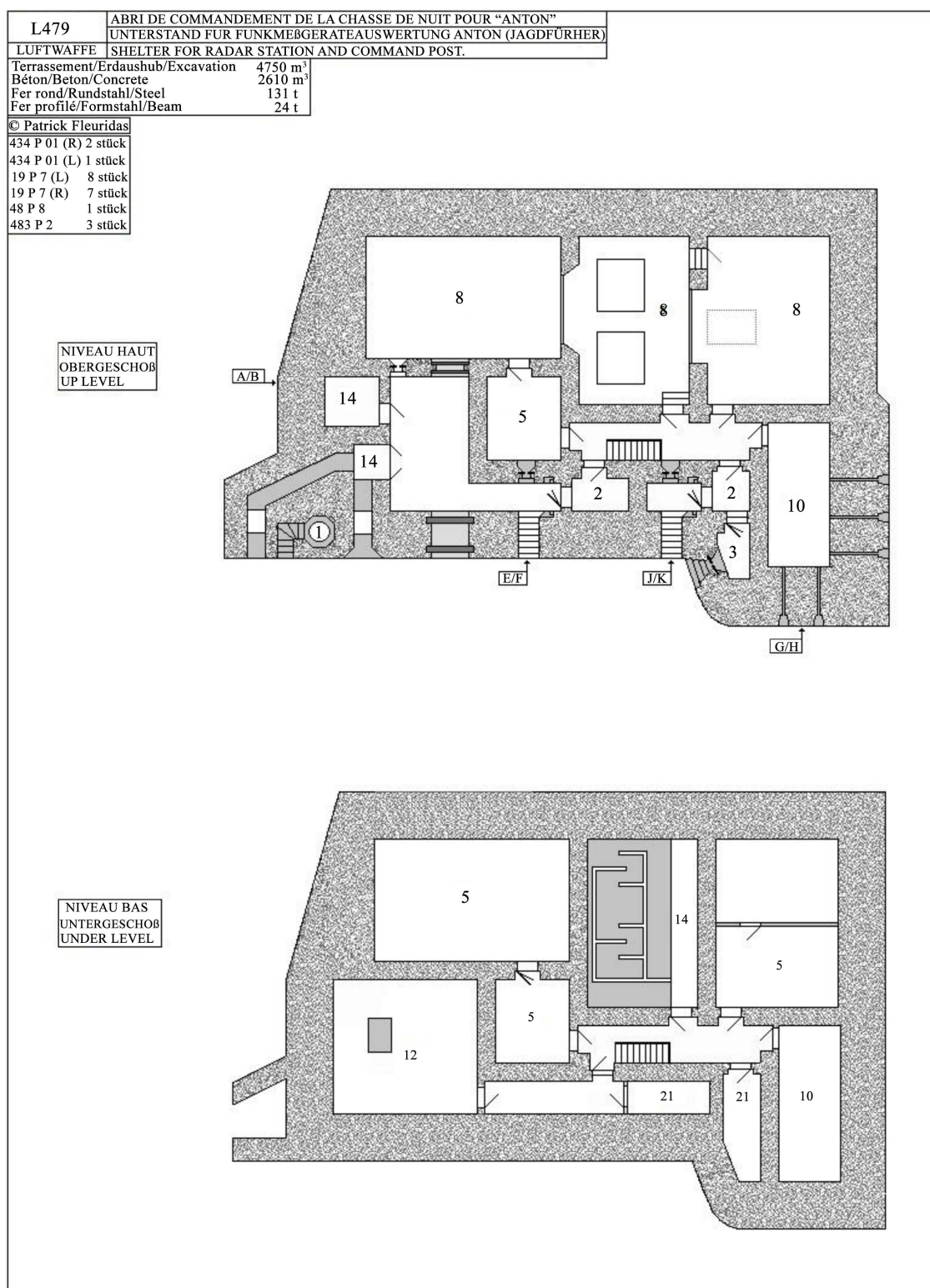


Figure A1. L 479 Anton shelter for radar station and command post-plan: 1 observation post; 2 gaslock; 3 close combat defence; 5 crew room; 8 command post; 10 wireless/telephone exchange; 12 ventilation; 14 command post; 21 store (Courtesy Fleuridas P.).

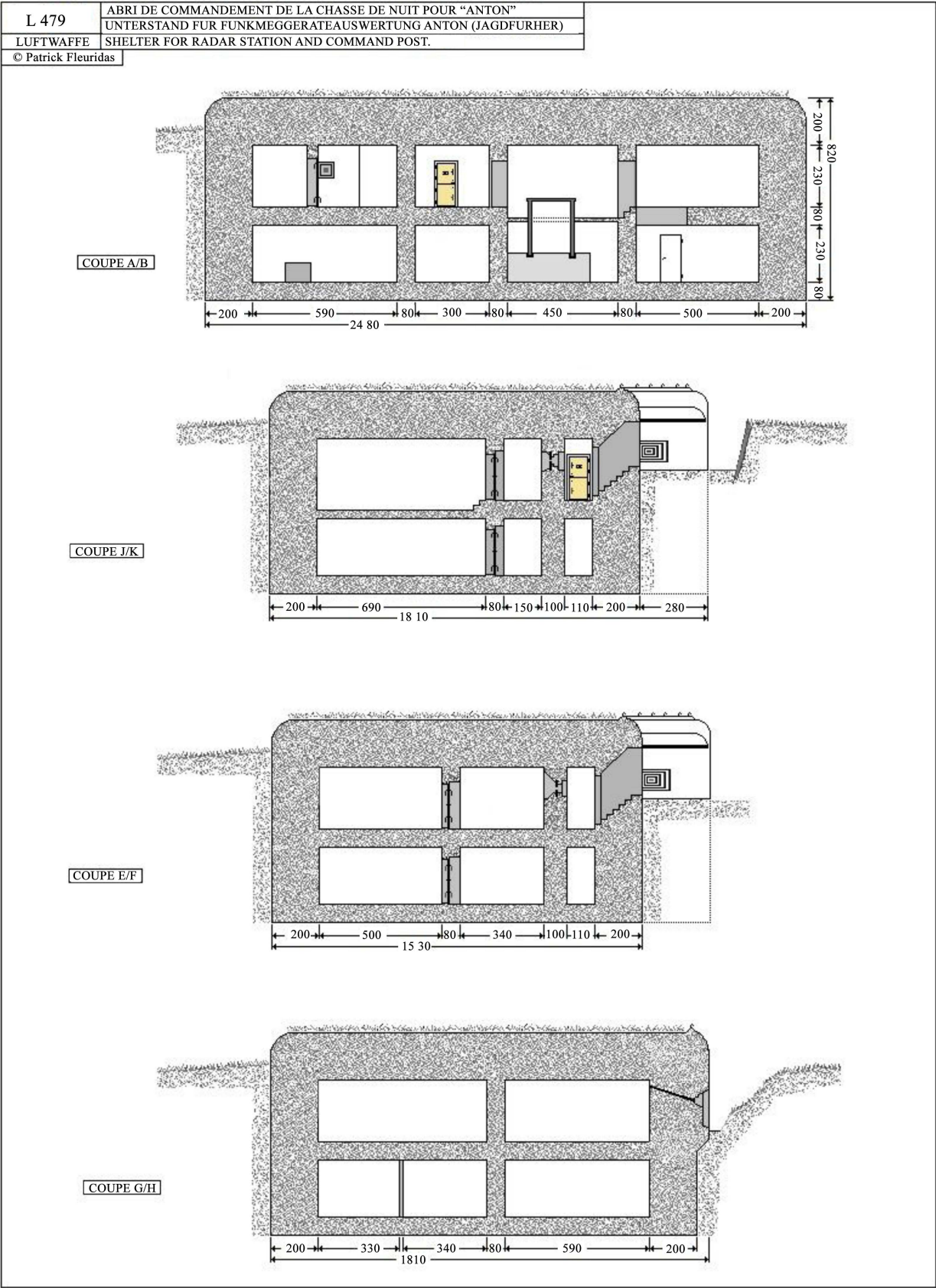


Figure A2. L 479 Anton shelter for radar station and command post-plan (Courtesy Fleuridas P.).

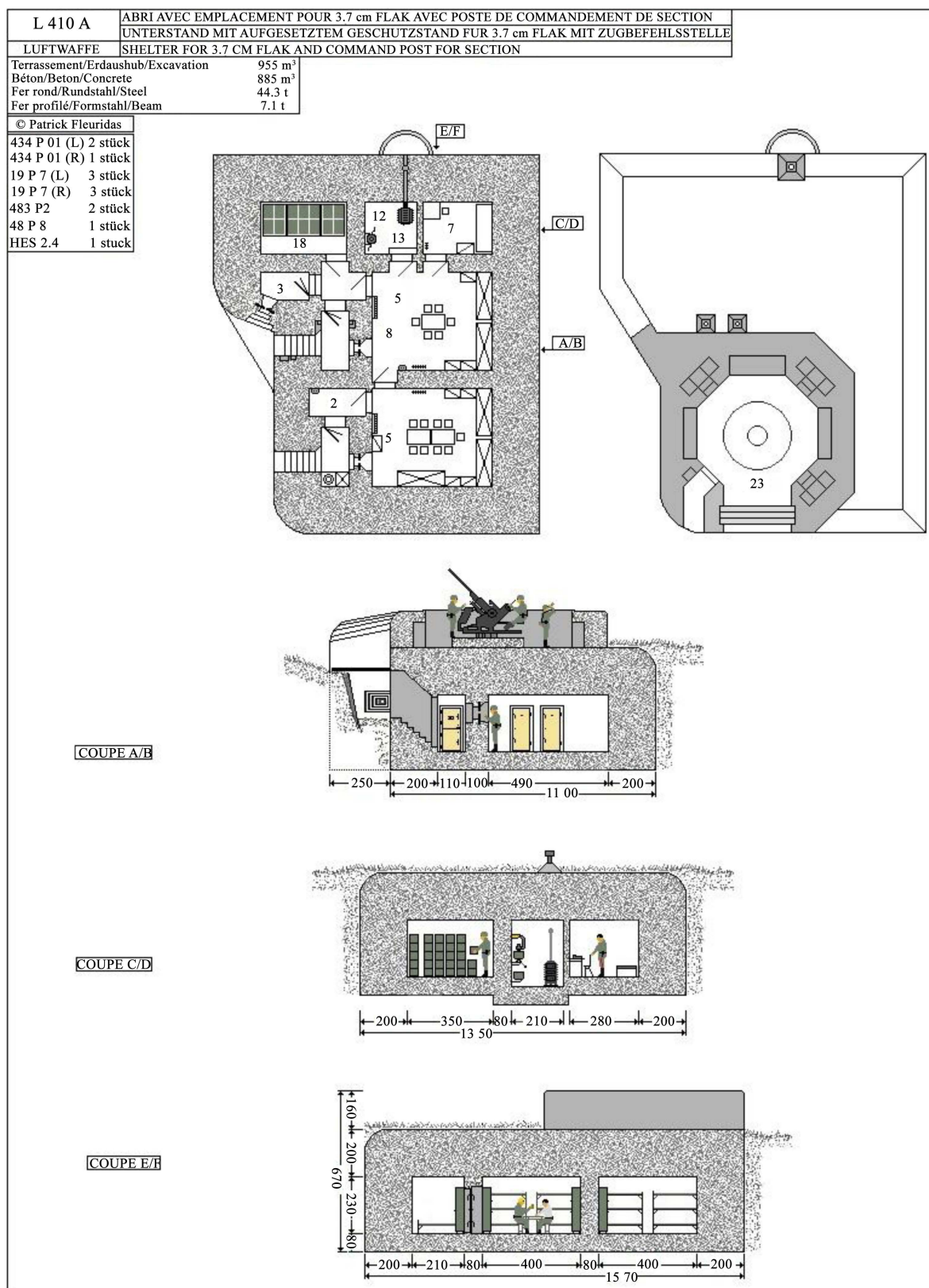


Figure A3. L 410 A shelter for 3.7 cm Flak and command section post-plan: 2 gaslock; 3 close combat defence; 5 crew; 7 non-commissioned officer; 8 close combat defence; 12 - 13 ventilation; 18 ammunition; 23 gun emplacement (Courtesy Fleuridas P.).

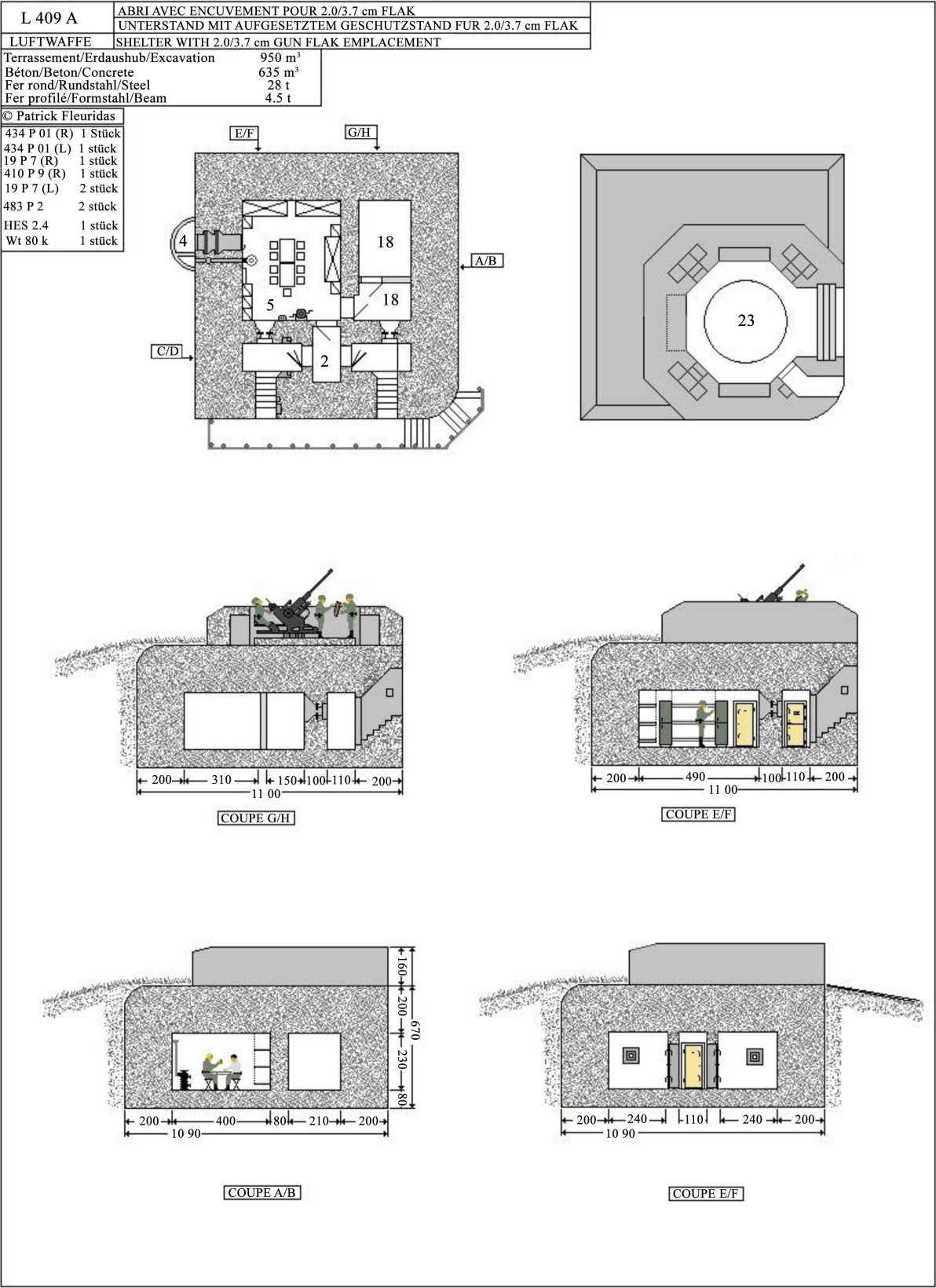


Figure A4. L 409A shelter for 2.0/3.7 cm gun *Flak* emplacement, plan: 2 gaslock; 4 emergency exit; 5 crew; 18 ammunition; 23 gun emplacement (Courtesy Fleuridas P.).

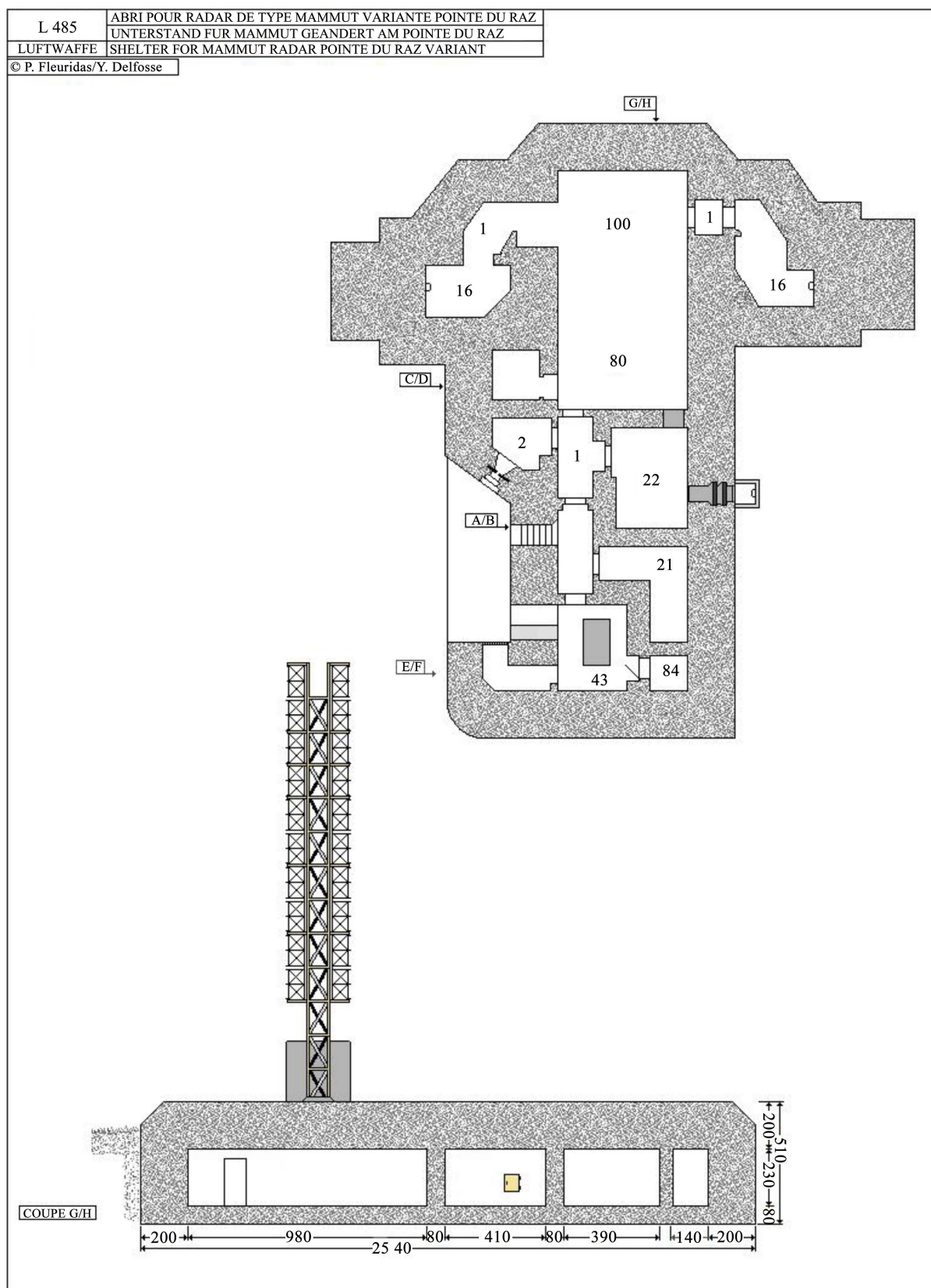


Figure A5. L 485 shelter for *Mammut* radar, plan: 1 gaslock; 2 close combat room; 16 antenna room; 21 heading; 22 ventilation; 43 engine room; 80 workshop; 84 recooling; 100 compensator (Courtesy Fleuridas P.).

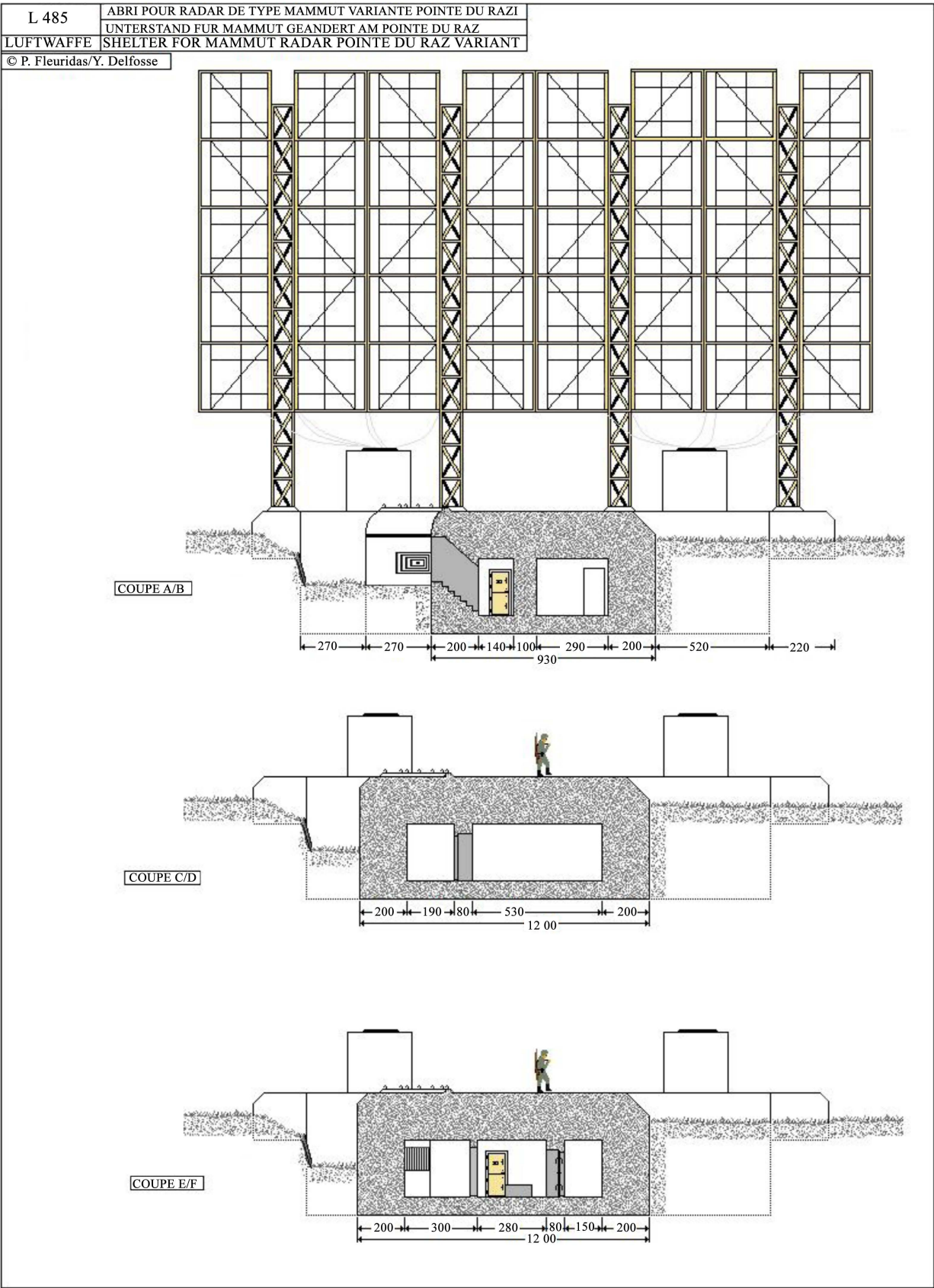


Figure A6. L 485 shelter for Mammut radar, plan (Courtesy Fleuridas P.).

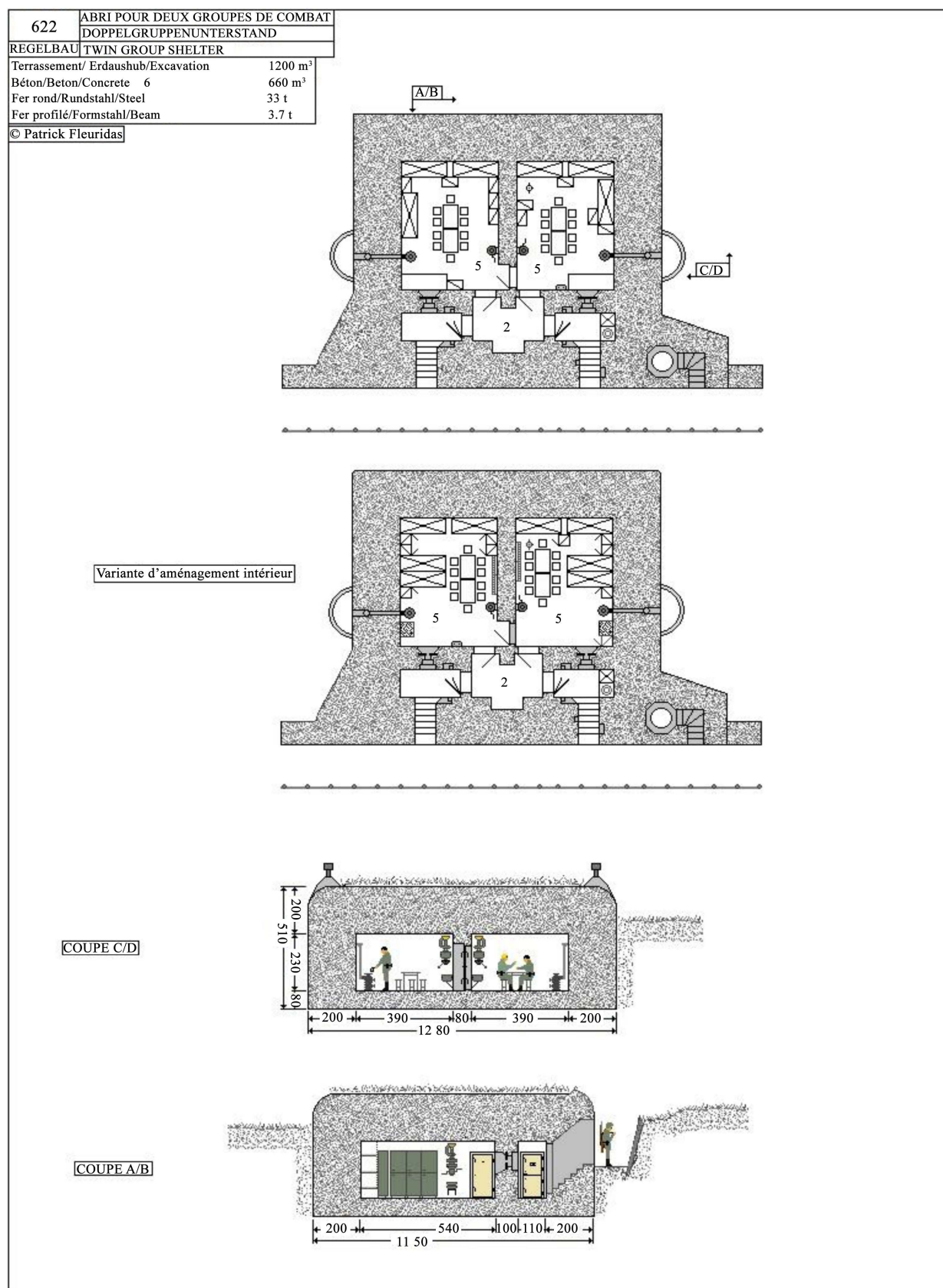


Figure A7. R 622 twin group shelter, plan: 2 gaslock; 5 - 6 crew (Courtesy Fleuridas P.).

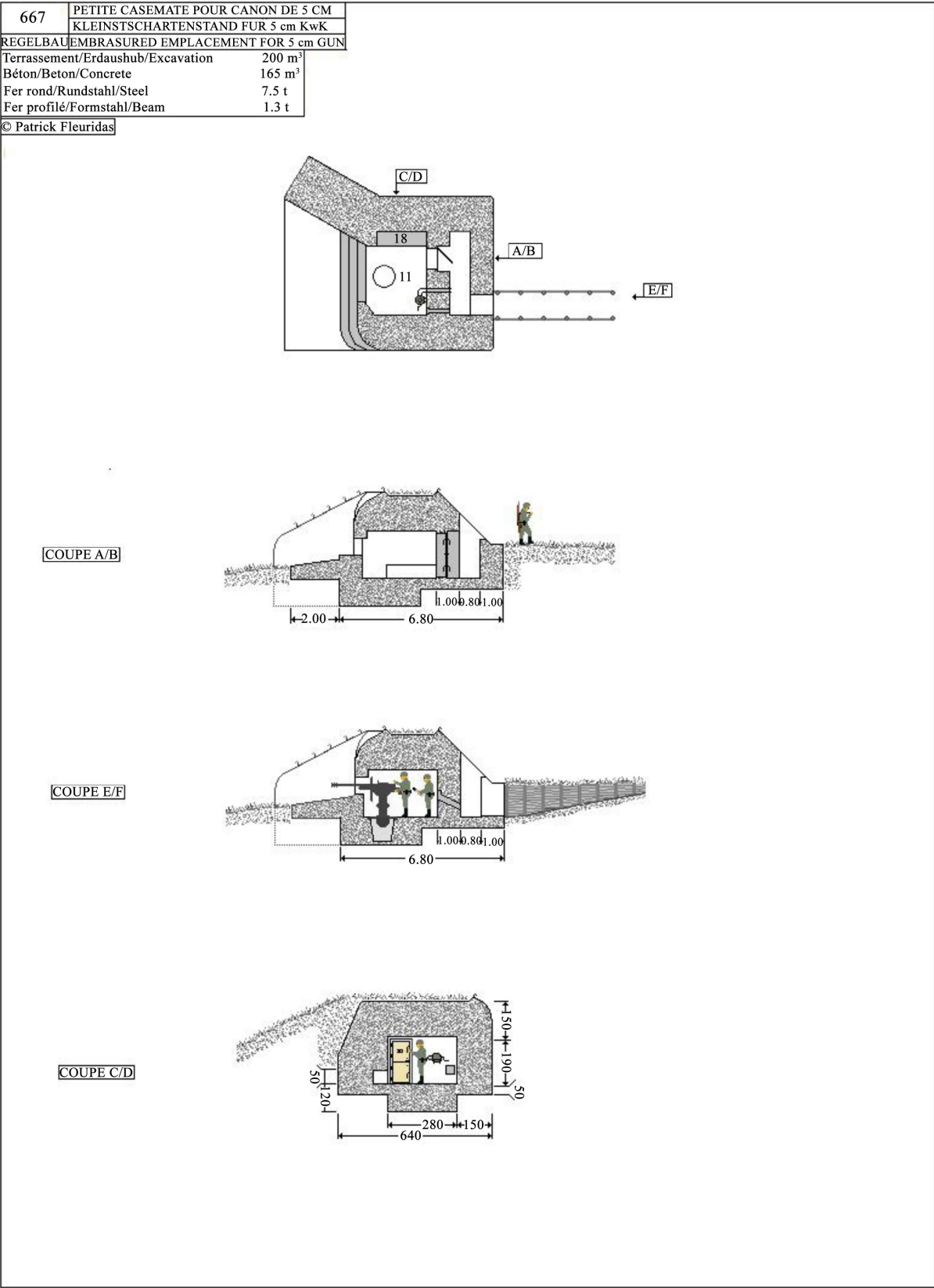


Figure A8. R 667 embrasured emplacement for 5 cm gun, plan: 11 combat room; 18 ammunition niche (Courtesy Fleuridas P.).