MDF.

Ken Follett

From: Bernard Green [Syemon.Es@btinternet.com]
Sent: 30 November 2000 12:34
To: Ken Follett
Subject: Re: Exchange


Xchange.doc

Good morning Ken

Still drawing a blank on details of German cable routings etc. They did use some near microwave line of sight radio links for secure communications as this link was untappable without a lorry load of equipment.
A lot of French staff were being replaced by Germans around 1943-44 to try and reduce the amount of sabotage. Especially in railways and some French factories.

German history (west Germany) has a big gap between 1935 and 1945. The east did try and keep the records and the war was part of the school curriculum.

The Germans did make special arrangements to protect telecomms, there is a harrowing description of how the "Das Reich" Division charged with maintaining freedom of communications, road rail telephones and telegraphs acting on orders massacred 240 women, 205 children and 197 men at Oradour sur Glane (near Limoges) on the 10th of June 1944 as a reprisal for resistance activity in other areas and as a warning.

I've attached the scene back with a couple of comments inserted. It converted into word 97 format, if you can't read it let me know and I'll paste it into a mail.

I still have difficulty with the concept of a fire being able to develop fast enough to reach the melting point of copper before fire alarms and phone circuit alarms alert staff to fire.

There has to be an accelerator of some sort. I think about the burning of old cable to remove the insulation before selling the copper for scrap and it took a lot to get the insulation to burn and even in a fierce fire fanned by wind the copper was still in wire form. The MDF will be in a closed room so the available oxygen will be used up fairly soon after the fire starts. (I once read a story where fire extinguishers had been filled with liquid oxygen, beyond reality)

I have just tried melting some copper wire of the similar size to jumper wire. It requires the hottest part of a gas flame to melt it.

It looks like the destruction of the MDF to a non functional state is feasible but total loss of the re-connection information is impossible to achieve. The replacement of the MDF and its components would be a couple of days work. Replacement of the internal cables from MDF to the exchange would then take place. Concurrently the cables from the street would be being replaced and made ready to pull into the MDF room and be reconnected to the MDF as soon as it was ready. In the cable chamber depending on the layout some temporary patching of main routes past the chateau exchange would be done almost immediately. This is where the records held in the remote exchanges could be used. First priority is to establish a service phone between engineers at the cable ends in chateau and staff at the remote exchanges. A field telephone (or similar) would be connected to the first pair of wires in the major cables and eventually the other end would come on the line when they realised that chateau exchange was not working.

Typically the following could happen assuming the chateau is between Hirson and Riems :-

Hirson exchange staff tells chateau I have a circuit on pair 10 in the cable which must connect to the Riems exchange on their circuit CH45. Chateau records if available will show which cable and which pair from chateau are connected to Riems as CH45. This link will then be "bodged" with a jumper from cable to cable. If the records are lost at chateau then the chateau engineer can ask the Riems engineer which cable and pair are his CH45 circuit. These work around connections for priority circuits would be well planned and almost routine,

My devious mind suggests that if the work arounds have been lost at chateau and the service phone has to be used then by intercepting the engineers service pair along the cable route it would be possible to mis-inform the chateau engineer as to the required connections. But again the German record keeping was too meticulous for all copies of the records to be completely lost.

Very often UK exchanges had empty cable ducts connecting manholes near an exchange to a suitable building where a temporary exchange could be set up. If the main exchange was knocked out bypass cables and the temporary exchange would go in. Possibly the Germans would have done something similar for the main routes.

Getting back to battery damage, pity that the Allies are going to use the exchange afterwards. I recall the time I accidentally blew up a car battery that I was boost charging in the shed. Thinking the charger was turned off I disconnected the crocodile clip from the battery, next thing I remember was silence, both ears had gone deaf, the top of the battery was split open and there was blood dripping from a cut on my arm.

The oxygen and hydrogen gassing out from the battery had exploded violently ignited by the spark.

If the battery room was in the cellar of the chateau with the standard heavy steel doors to prevent access then closing off the ventilation system, jamming the charger circuit at full boost and arranging for a spark or other ignition an hour or so later would do quite a bit of structural damage.

Best Regards

Bernard

----- Original Message -----
From: "Ken Follett" <kenprivate@ken-follett.com>
To: "Bernard Green (E-mail)"
<syemon.es@btinternet.com>
Sent: Thursday, November 30, 2000 3:37 AM
Subject: Exchange

| <<Xchange.wpd>> Dear Bernard, Here is a little scene in which one
| character explains to another the plan to disable the telephone
| exchange. I think makes sense based on what I have learned from you and
| others. What do you think?
| Your help is much appreciated.
| Yours,
| Ken.
|

As they drove, Flick explained the mission. "The chateau contains a new automatic exchange put in by the Germans to handle all the extra telephone and teleprinter traffic between Berlin and the occupying forces."

++++ Is it staffed by Germans or local french PTT workers, by 1944 germans replaced many key railway jobs with german staff to reduce the amount of sabotage. If the Germans installed the exchange then they would probably have used german staff for german equipment. Unless of course they had commandered it from the French PTT and had the French install it for them.

Greta was sceptical. "But sweetheart, even if we succeed, what's to stop the Germans just rerouting calls around the network?"

"Simply the volume of traffic. The entire system is already overloaded. Imagine how many thousand extra calls and teletypes there will be when we invade France. Now imagine that the main automatic exchange is out of service, and all those calls have to be made the old-fashioned way, by hello girls, taking ten times as long. Ninety per cent of them will never get through."

"The military could prohibit civilian calls."

"That won't make much difference. Civilian traffic is only a tiny fraction anyway."

"Then they'll switch to wireless communication."

"That's what we want."

"Why?"

"Wireless messages can be intercepted."

"Don't they use codes?"

"Codes can be broken."

"Okay, I think I'm beginning to get it." Greta thought for a minute. "But they will repair whatever damage we do."

"Exactly. So I need you to think about what kind of destruction would take longest to put right. We want the exchange out of action for at least two weeks." Michel had been through all this with Arnaud, a member of the Bollinger circuit who worked for the French PTT, but Flick had not queried the details, and Arnaud had died in the first raid.

Greta said immediately: "The first thing would be to wreck the MDF."

"What's that?"

"The Main Distribution Frame. Two sets of terminals on large racks. All the cables from outside come to one side of the frame; all the cables from the exchange come to the other, and they're connected by jumper links."

"Where would that be?"

"In the exchange cable chamber. It's a room that all the wires pass through. Ideally, you'd want a fire hot enough to melt the copper in the cables."

++++If Greta is a telephone type she would use the phrase ""It's a room that all the CIRCUITS pass through.""

+++Copper melts at 1080 degrees C

+++ The cable chamber is often in the basement with cables coming in through seals in the basement walls. The MDF would normally be in room of its own above the cable chamber. The jumpering is changed frequently to suit changes in subscribers and remote exchanges. In war time loss of an exchange or main cable would result in rejumpering to work around the missing circuits. The MDF also has the test points and probably (but not always) protection fuses for the lines. The test equipment would probably be in the same room so good access is required. Some MDF rooms double as the tea room/ rest room as the MDF is the only silent piece of equipment in the exchange. ((Thought a new couch for the engineer could be the way the incendiary materials are bought in The idea of sleeping on a mattress stuffed with gun cotton. No gun cotton is explosive not incendiary)).

"How long would it take to reconnect the cables?"

"A couple of days, if you had the record cards."

"Record cards?"

"They show how the cables are connected. They're normally kept in a cabinet in the chamber. If we burn them, too, it will take weeks of trial-and-error to figure out the connections."

++++ The exchange at the other end of the cable would have a form of duplicate record as well This is to enable the remote engineer to advise the local engineer about re-jumpering the local MDF to work around damage in the remote exchange. Also there would be a second set of records away from the MDF

"That sounds better."

"They can reconnect a few lines quite quickly, for the most important calls, simply by pulling cables out through the next manhole down the road and patching from there with surface lines; but that only gives them a

small percentage of their original capacity."