

BEST AVAILABLE COPY

MOK-A-24319

Chief, Foreign Division M
Chief, Foreign Division W
Chief of Station, Karlsruhe

20 November 1950

Interrogation of Dr. Ing. Frank FRUENDEL

REFERENCE: WDC-A-792, WASH 19460, []

1. As I did not obtain the proper cryptonyms for the two representatives who arranged the meeting with FRUENDEL and Peter Ad. TIEDEMANN, I shall refer to them as "intermediaries."

2. At a few minutes after 1000 hours I was introduced to one of the intermediaries by [] as []. Without [], we then proceeded to an office where FRUENDEL, TIEDEMANN, and another intermediary were waiting. Immediately after introductions, FRUENDEL presented his ideas conveniently beginning with the one of primary interest to us, the glide bomb control. Lunch was served in the office and afterward we continued the discussion of the glide bomb, and also the torpedo exploder. As this latter instrument works on the same principle as the glide bomb control, very little time was devoted to it.

3. Throughout the meeting FRUENDEL was cooperative and open in presenting his inventions or answering questions. He demonstrated an excellent understanding of his field of science. He made no attempt to boast or use high pressure sales methods, although he is eager to get cash to finance his present non-military work. All-in-all it was a pleasant session in which FRUENDEL presented his wares for our consideration. He readily admitted that he had no knowledge of progress on this matter in the United States and realized that if these or better methods were already available or if his methods were tactically unsatisfactory at this stage, we would have no further interest.

DECLASSIFIED AND RELEASED BY
CENTRAL INTELLIGENCE AGENCY
SOURCE/METHOD EXEMPTION 3B2B
NAZI WAR CRIMES DISCLOSURE ACT
DATE 2006

DISTRIBUTION
FDX 2 w/2 incl.
2
1 (direct)
SC 1
File 1

In: FDM, FDR, []
22 Nov. 1950 - RFF

COPY SECRET

SECRET

4. PERSONALITY DATA

FRUENDEL, Dr. Ing. Frank — about 34 years old; before the war was a citizen of Danzig

- 1935-1939 — at Technische Hochschule, Danzig, where he studied technical physics under Professor KOSSEL and received his Diploma Engineer degree
- 1939-1945 — Owner and director of Gerateentwicklung Danzig G.m.b.H.
- 1944 — received Doctor Engineer degree for work in spectral discharge of sparks
- 1945-1947 — worked in electromedicine as director (leiter) of Scillo (Hamburg)
- 1948-date — owner and director of independent laboratory, Physikalisch-Technisches Laboratorium, G.m.b.H., Hamburg-Rissen, Suellendorfer Landstrasse 400, constructing stroboscopes and ultra-sound equipment (pamphlets describing his present equipment are enclosed— as Attachment A).

(In January 1951 he plans to send a representative, Ing. Helmut VORGE, an American, to Dayton, Ohio.)

5. TECHNICAL DISCUSSION

a. Control of Glide Bomb. The wire control of glide bombs such as the FX-1400 was unsatisfactory, as abrupt changes in direction by either the controlling aircraft or the bomb caused the wire to break. Knots in the wire also caused difficulties. As the use of the radio controls offered easy countermeasures to the enemy, a method of transmitting command signals by means of high intensity light flashes was explored. Work on this was conducted at the Gema, Berlin-Koepenick, under Dr. Fnu KOBER, who is now at Dayton, Ohio (Wright Field) and at AEG and Siemens under Professor FISCHER (also in the US, location unknown). In 1941 AEG and Siemens were able to transmit commands a distance of only 1 km, which was extremely inadequate.

b. The Light Control. Dr. FRUENDEL undertook research in this problem in Danzig for the Reichsluftfahrtministerium (RLM) and in the period March-August 1944 successful tests were conducted with a glider at a distance of 15 km in Ainning at the Deutsche Forschungsanstalt fuer Segelflug (DFS) (under Professor FISCHER). The light control research was considered completed in October 1944, and no further work was done, due to the tactical situation which obtained. Working with FRUENDEL was a Dr. Ing. THORWART and Ing. HANDS, who died in 1948. Knowledge of this research was known only to a small number of persons and no attention was paid to it and particularly to Dr. FRUENDEL in this connection after the war. With the arrival of the Soviets, Dr. FRUENDEL fled to the West and in 1946 claims the Soviets attempted to kidnap him, but he was warned and the attempt failed. FRUENDEL does not know whether the Soviets were interested in him for his light control work or whether they ever knew of it.

BEST AVAILABLE COPY

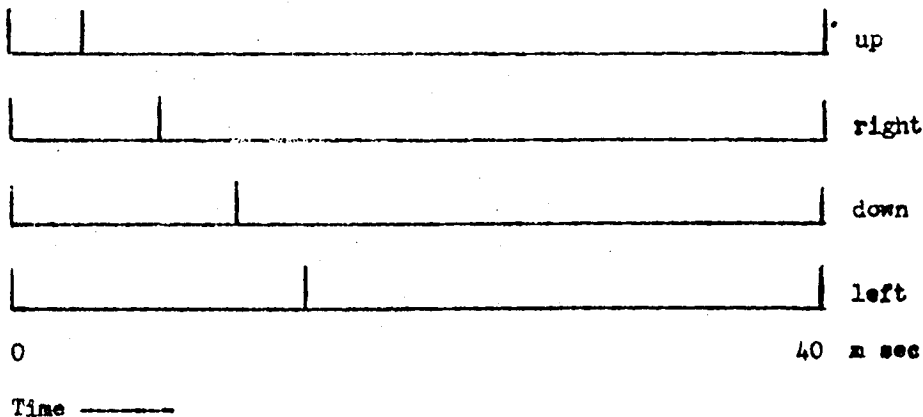
BEST AVAILABLE COPY

SECRET

c. By means of a gaseous discharge lamp of quartz containing primarily Argon at 3 to 5 atmospheres pressure and operating on the principle of the Stroboscope, intense light flashes of short duration were obtained. The secret of obtaining the high intensity is to a slight extent in the lamp, but primarily in the circuits which results in the spark resistance being equal to the aperiodic limit resistance. The intensity of the resulting light flash was 10^{11} candle power or 10^{11} Lux. The intensity at 10,000 meters was theoretically therefore $10^{11} \times 10^{-8}$ Lux or 100 Lux. Due to atmospheric absorption and other effects, the intensity was about 10 Lux at 15,000, and sufficient to actuate the photo cell. The peak of the flash was obtained in 10^{-7} seconds and the useful wave-lengths were in the 3000-3800 A° region with the maximum intensity between 3500 and 3600 A° . In this region the effect of solar radiation was about 1 Lux in spite of the fact that the intensity of the light from the sun was about 50,000 Lux. As long as the effect of impulses from the transmitter were 5 or 6 times that of the effect of the sun in the photocell, command signals could be transmitted.

d. To direct the beam a mirror of a 35 cm diameter was used. (A photo of similar equipment with a mirror of 25 cm is enclosed as Attachment B. As the equipment shown is a stroboscope, the box nearest the light source and reflector is unnecessary in the control equipment.)

e. Command signals were given by means of three impulses with the differences between signals determining the command. Professor FISCHER is supposed to have knowledge of this aspect of the problem. For example, command would appear as follows:



f. The receiver is an ordinary type photo-tube 10 cm in diameter and with angle of view of 140° . If desired, filters can be used on the transmitter and receiver.

BEST AVAILABLE COPY

g. Dr. FRUENDEL was concerned only with the method of transmitting command signals by means of light over large distance. He has done no work concerned with the ballistics of the missile or the means of converting the signals to effective commands, or with the actual control of the missile in flight. His equipment could be used in either a glide bomb or an anti-aircraft missile. Naturally, with the use of light, the transmitter must be kept directed on the missile at all times.

6. TORPEDO EXPLODER

a. The torpedo exploder operates on the same general principal but with either ultra-violet or infra-red radiations. The transmitter using a much smaller mirror than the 35 cm used in the plane with the glide bomb is located in the forward part of the torpedo and sends out intense flashes upward and slightly to the rear. The receiver located in the after-portion of the torpedo watches upward and slightly forward. Activation of the exploder can be made dependent upon a definite number of flashes being reflected, and so give the torpedo some powers of discriminating the beam of target ships. Depending upon water composition, the device is effective from 6 to 12 meters below the hull of the target ship. According to FRUENDEL, about 1000 test firings were made with the exploder device functioning satisfactorily 100% of the times after the first several tests.

7. GENERAL

a. In the general discussion, the intermediaries indicated they wished an early decision as to our future interest in Dr. FRUENDEL's equipment. I explained to them that I could not give this as I was not current on trends or accomplishments in research in the United States; these as well as tactical considerations would have as important a bearing as the technical feasibility of Dr. FRUENDEL's equipment as to whether we had further interest. Therefore, such a decision would have to come from a higher level. I mentioned it was known that some success had been made in World War II with torpedo exploders and that development since then may well have solved all problems in that line. Concerning the bomb control, it may be that a good method of transmitting signals may have been already developed, and that major problems might lie in other phases of the missile, such as stabilization, means of translating commands to accurate changes of directions, homing devices, or higher missile velocities, etc. Earlier, one of the intermediaries and I had discussed "crack-pots" with whom they seemed to have little experience. Therefore, I did tell them that Dr. FRUENDEL was obviously a good scientist with interesting ideas and that we were glad to have had the opportunity to talk to him.

b. Methods of making further contacts were also considered. Our intermediaries considered it unwise for talks to be conducted in Germany, as discovery of this in certain quarters might cause difficulties for FRUENDEL with occupation authorities. Also, they considered it dangerous for them to sponsor Dr. FRUENDEL too frequently for visits to their country. Therefore, they were eager for a tentative answer by Saturday, 18 November, when he is scheduled to return to Germany. While at lunch and relaxing, one of the intermediaries did suggest that FRUENDEL leave his papers (wartime research) with them rather than to carry them back and forth across the

SECRET

border. To this he readily agreed and when I departed about 1947 they were busy putting them in brown envelopes and preparing the sealing wax. In view of this development, I showed no interest in borrowing his papers for study at any time, feeling that our hosts had taken care of this detail with forethought and that photo copies would no doubt be available whenever we want them. This fact was mentioned to AINSLEY prior to my departure.

c. At my request for an estimate, FRUENEGEL stated he could rebuild in 8 weeks all the necessary equipment operating on 110 volts in Hamburg under the guise of his licensed production for about 12,000DM. The actual cost of producing them in quantity would be about 1200 DM. He also offered to furnish an official German document testifying to the successful tests at 15 km, but was afraid he had left it in Hamburg in the hurry of packing. If available he was to leave it with our intermediaries. FRUENEGEL has not continued his military research since the war, though he has made improvements on his straboscope equipment. He reports he can achieve 400 flashes per minute without excessive heating of the equipment.

d. FRUENEGEL is not interested in accepting a position in the United States as he wishes to maintain his status as an independent worker. He would willingly go to the United States for about a month, but would not accept an offer as an employee. He admitted that he would like to be able to live in America if he could continue to operate an independent laboratory. He also has no definite price in mind for the light control equipment, if we wished to have it. He apparently put some of his personal funds into its development and would like to recover them for financing research work of his firm. He mentioned in this connection, 40,000 DM.

e. If you have further interest in FRUENEGEL or his invention, I believe that a contact can be safely made in Hamburg, but it should be coordinated with the other base concerned. It would have been possible to have had several more meetings with FRUENEGEL in order to go over his invention in more detail, but this was not done for several reasons. First, he had not continued his work since the war. Second, he had only one small component of a guidance system to contribute, which may or may not be important to us. Third, he gave reference in the United States that can be checked to determine the accuracy of his statements. Fourth, if his ideas are of interest, it would be better to conduct detailed discussions when armed with specific questions, which can be easily furnished now that the limits of what he has to offer are known.

[]

BEST AVAILABLE COPY