Reproduced from the Unclassified / Declassified Holdings of the National Archives

Dear Patron:

We regret that the enclosed digital images are the best we are able to obtain using our normal digital reproduction process. This is caused primarily by the age and faded conditions of some of the documents for which these images are made.

Reproduced from the Unclassified / Declassified Holdings of the National Archives

DECLASSIFIED
NHB 960218
Authority
By LJ NARA Date 6-4-14

Property of The Industrial
College of the Armed Forces

ITEM No. 1
FILE No. XI-7

COPY No. 68

Classification cancelled by
authority of U.S. Navy Dept.
Bulletin, July Dec 1945
V.M.V.

SECRET

GERMAN RESEARCH AND DEVELOPMENT IN THE RADIO FIELD, LYONS AREA

SECRET

COMBINED INTELLIGENCE OBJECTIVES SUB-COMMITTEE

Reproduced from the Unclassified / Declassified Holdings of the National Archives

DECLASSIFIED
NHD 760218
Authority
By LT NARA Date 6-14-76

~~S E C R E T~~

GERMAN RESEARCH AND DEVELOPMENT IN THE RADIO FIELD
LYONS AREA

Classification cancelled by authority of: U.S. Army Dept. 1945, Bulletin 1, 31 July - Dec.

Property of The Industrial College of the Armed Forces

Reported By

Capt. J.Z. MENARD, Sig. C.
ETOUSA

CIOS TARGET NUMBERS 1/189, 1/19(b), 1/210
RADAR

COMBINED INTELLIGENCE OBJECTIVES SUB-COMMITTEE
G-2 Division, SHAEF (Rear) APO 413

Reproduced from the Unclassified / Declassified Holdings of the National Archives

DECLASSIFIED NHD Authority 760218 By LT NARA Date 6-14-14

TABLE OF CONTENTS

Reproduced from the Unclassified / Declassified Holdings of the National Archives

DECLASSIFIED
NHD 760218
Authority
By LT NARA Date 6-14

~~SECRET~~

HEADQUARTERS
COMMUNICATIONS ZONE
EUROPEAN THEATER OF OPERATIONS
OFFICE OF THE CHIEF SIGNAL OFFICER
APO 887

Technical Liaison Division

19 November 1944

SUBJECT: Report on Investigation of the Lyon Area for Information on Enemy Research and Development in the Radio Field.

1. On 26 October 1944, Captain James Z.Menard, Mr. Eugene Pack and Mr. Lucien L. Farkas accompanied by M. Eugene Giboin, Chief Engineer for the Direction des Industries Mechaniques et Electriques, Ministere la Production Industrielle, proceeded to the Lyon area and arrived in Lyon on 27 October 1944.

2. The objective of the group was to investigate two Black List Targets in the Lyon Area, investigate production facilities of several French factories, and obtain any available information about German research, development and production in the field of Radar and controlled-missiles.

3. This information was obtained by visiting French radio companies, conferring with the engineers, inspecting their laboratories and factories, examining prototype equipment and components submitted by the Germans inspecting equipment and components being produced for the Germans and, questioning French engineers and technicians who had visited or worked in Germany during the years of occupation.

4. During the period of the 27 October until 2 November 1944, members of the group visited all the points considered to be of interest in the Lyon Area. Data obtained at that time led to investigation of additional targets in Paris and vicinity. Work was completed

Reproduced from the Unclassified / Declassified Holdings of the National Archives

DECLASSIFIED
NHD 960218
Authority
By LT NARA, Date 6-14-96

on the project on 16 November 1944.

5. It is pointed out that there is no assurance of the reliability or accuracy of all statements reported herewith.

6. Summary of points of interest.

(a) As was expected, the Germans had not entrusted the French with development or production of any very important equipment. By procrastination, the French had avoided delivery of any significant material to the Germans.

(b) The Lyons laboratories of Le Materiel Telephonique had developed several radar, pulse telephony, and pulse telegraphy equipments, which displayed ingeneous circuits and technique, though not up to the standard set by Allied equipment. (Target I)

(c) At the firm of Cartex at Annecy, two engineers who had visited Germany and worked with a German engineer were interviewed. Some information of possible interest concerning German radar activities was obtained. (Target III)

(d) On several occasions the party encountered reference to German interest in schemes for plane to ground television systems.

(e) From the tube manufacturer, Visseaux, and from L.M.T. data sheets for a number of German tubes were obtained as well as samples of several tubes. The specifications of ten were thought to be of possible interest and are attached to this report. (Target I and II)

(f) The locations of several German manufacturers, and radar organizations are given in the reports, as well as some information on personalities.

(g) The depot for all Wasserman spares was reported to be located at Milan, Italy

Reproduced from the Unclassified / Declassified Holdings of the National Archives

DECLASSIFIED
NND 760218
Authority
By LT NARA, Date 6-14-76

SECRET

(Sg) JAMES Z. MENARD
Captain, Sig C.

(Sg) EUGENE G. PACK
O.A.B. O.S.R.D.

(Sg) LUCIEN L. FARKAS
O.A.B. O.S.R.D.

Reproduced from the Unclassified / Declassified Holdings of the National Archives

DECLASSIFIED NHD Authority 960218 By LT NARA Date 6-14-96

~~SECRET~~

27 October to 2 November, 44

I. LE MATERIEL TELEPHONIQUE (L.M.T.)

28 Rue Valentin-Couturier, Lyon Telephone: BUR 85-65

1. Sources of Information.

a. Persons Interviewed:
M. J. Berrier, Administrator
M. J.B. Lair, Technical Director
M. Touraton, Transmitter Dept.
M. de Faynoreau, Receiver & Indicator Dept.
M. de Gouvenain, Measuring Equip, Antennae
M. Ahier, Radiogoniometric devices
M. Derjavitch, Pulse Telephony & telegraphy

b. Facilities inspected: A Lorenz RD 12 Td tube was examined. The four LMT laboratories were visited and developments of M.F. measuring apparatus, transmitters, radar receivers and indicators, radiogoniometric devices, pulse telegraphy and telephony inspected.

2. Information Obtained on German Sponsored Activities.

a. The Germans requested LMT to study production of the multiplex system labeled (Moritz). This consisted of a 30 centimeter oscillator used in a portable frequency modulated transmitter with four telephone channels, and with an approximate range of 20 kilometers. The maximum frequency deviation of the system was 100 kilocycles, (25 kilocycles for each channel). The phone input channels was three 4 wire and one 2 wire circuits. The equipment was presumed to operate on 6 volt batteries using vibro-packs. The LMT engineers managed to withhold a Lorenz RD 12 Td tube labeled "Stuttgart", which was to be used as the 1,000 megacycle oscillator. Data sheets on the Lorenz RD Tb triode, RD 12 Ga and RD 2, 4 GC dual diodes tubes were secured.

b. The Germans also ordered conversion of an LMT 21.5 to 24 centimeter wavemeter to cover 30 centimeters. This order was never filled.

Reproduced from the Unclassified / Declassified Holdings of the National Archives

DECLASSIFIED
NHD 760218
Authority
By LT NARA Date 6-14

c. M. de Faynoreau stated that the firm of Renard et Moireaux in Paris had manufactured a pulse phase modulation jamming transmitter on 1.2 to 1.8 meters.

3. Independent French Activity:

Radio equipment and system developed in the LMT laboratory included the following items, none of which are being produced in any quantity.

a. Radio Measuring Equipment.
Frequency meters, 48 to 56 centimeter with rotary coaxial lines and straight coaxial lines.
Band-switched frequency meters 1 to 12 meters.
Straight coaxial line oscillators 48 to 56 centimeters.
Rotary coaxial line oscillators 50 centimeters to 2 meters. Band-switched oscillator $1\frac{1}{2}$ to 12 meters, also capacity meters, calibrated voltage dividers, measuring oscilloscopes and a rack for the oscillosgraphic examination of receiving tubes.

b. UHF Transmitters:
The following UHF transmitters were demonstrated:
Several folded line pulse oscillators 50 centimeters to 8 meters, using tubes similar to British "Micropups", (NT-98) and piston tuning of plate and filament.
Air cooled oscillators of 75 centimeters with a 40 kilowatt peak and 1.5 microsecond pulse as well as a $1\frac{1}{2}$ meter oscillator, 60 kilowatt peak, $1\frac{1}{2}$ microsecond pulse width.
A water cooled oscillator on 4 meters with 60 kilowatt peak for a 5 microsecond pulse.
These transmitters were pulse modulated by the voltage surge in an inductance which was then used to unblock the grid of the oscillator tube. It was stated that widths of .5 microseconds had been reached with the above oscillators. The pulse repetition rates were 250 and 500 pps. As the work was carried on during the German occupation it was impossible to try them with regular antennae, but experiments had been conducted with dummy loads. A shortage of modern tubes made it necessary to use standard transmitting tubes for modulators. The pulse shape viewed on a two microsecond sweep time-bore showed a fairly rapid rise time but a sloping trailing edge.

Reproduced from the Unclassified / Declassified Holdings of the National Archives

DECLASSIFIED
Authority NND 760218
By LT NARA Date 6-14-76

A spark gap modulation system was demonstrated. This system used unbalanced resistors, a group of spark gaps and condensers resulting in a build up of voltage from 2,000 to 30,000 volt peak. The resultant pulse had a 1/10 microsecond rise time. This system can be synchronized.

Experiments were also carried out with spark oscillators on 1½ meters, 4 meters and 8 meters. The spark gap was presurized and the sparks blown round the electrodes to prevent overheating. The spark transformer is a "Tesla" type coil with either primary of the whole coil under pressures up to 200 kilos per square inch. It was thought that peak powers of one megawatt could be reached. These spark oscillators were claimed to have an efficiency of 70%.

c. Radar Receivers, Indicators:

1) A 1.5 meter receiver had one R.F. stage, a tuned circular lecher-wire oscillator and 3 I.F. stages on 23 mc. The indicator consisted of an "A" oscilloscope with a 150 km time base on which were added large calibration pips every 50 km and small pips every 10 km. The first 50 km portion of the time base could be expanded and an accuracy of plus or minus 30 meters obtained. This accuracy was realized by triggering a multivibrator through a delay line of which portions were tapped off by a double contractor arrangement in 30 meter steps.

2) Another receiver indicator set-up included expansion of any one of the three 50 km sections of the time base.

3) A 75 cm lecher tuned receiver used 954 and 955 type acorn tubes as tuned to the oscillator and mixer respectively followed by three stages of 23 md I.F. the indicator used could also expand any of the three 50 km sections of the time base.

4) An RF pulse signal generator on 1.5 meters fed signals to the laboratory at a PRF variable in steps from 300 to 300,000 pps, positive or negative as well as corresponding saw tooth waves for sweep circuits.

5) A delay line operated by feeding supersonic waves through water. The modulator pulse was fed into a 23 mc crystal at one end of a brass tube filled with water. The impulse was received through a similar 23 mc crystal on an adjustable piston and fed into the receiver I.F. to produce a range marker. The delay of transmission through water was used as a linear

Reproduced from the Unclassified / Declassified Holdings of the National Archives

DECLASSIFIED
Authority NND 760218
By LT NARA, Date 6-14-14

indicator of range, calibration marks being inscribed on a knob adjusting the position of the piston. It was claimed that the line was flat over a 40 degrees C variation of temperature and that by varying the mixture of liquid used, this variation could be placed in different portions of the temperature range.

6) A PPI tube using rotating magnetic deflection, a long persistence screen, intensity modulation, blacking out of the main pulse at the center of the tube was seen. This system was said to have been developed by M. de Faymereau of LMT in 1939. Experiments are now being conducted on automatic sector scan using electrostatic deflection. This whole development was unknown to the Germans.

7) A pulse altimeter consists of an acorn tube transmitter with a .3 microseconds pulse at 3,000 volts on the plate of the tube, transmitting on 2 meters at a PRF of 1800 pps. The receiver used the same type of construction as the 75 cm receiver described in paragraph 3. This system was tested in planes and found satisfactory.

d. Radiogoniometer Equipment:

1) An automatic radiogoniometer on 200 to 2500 meters includes a rotating antenna coil and circular time base. A 135 kc voltage, modulated by the sine wave from an alternator rotating at the speed of the coupling coil, is fed into this same coupling coil. This voltage is also mixed with an unmodulated 135 kc carrier and the resultant voltage, when detected in a double diode supplies two pure sine waves, 90 degrees out of phase, to create a circular sweep. Signals superimposed upon the modulated 135 kc carrier upset the existing phase relationship creating a figure 8 with the nodes aligned in the direction of the transmitting station. Means are provided for listening to the station while watching the figure on the oscilloscope. A pointer is used to indicate the bearing of one station, then by tuning to another station, the bearing difference can be noted between the pointer and the resultant figure. Experiments are now underway to create the circular sweep with a rotating condenser.

2) The above method is also used for a light-weight installation on planes. A circular wound antenna crossed by a flat loop antenna and a sense antenna are mounted on the plane fuselage. This system, operating on 600 cps generated through an alternator

Reproduced from the Unclassified / Declassified Holdings of the National Archives

DECLASSIFIED
NHD 960218
Authority
By LT NARA Date 6-14-96

fed by a 24 volt battery, can be used as either a radiogoniometer or homing device.

3) A 3 meter blind landing device utilizes in the aircraft a radio beam with dot and dash sections. The azimuth is indicated on a meter. Height control is effected by three beacons spaced a set distance from and at the airport with the final glide directed by the constant field method.

4) A standard type loop homing device works on a frequency of 200 to 1500 kc.

e. Pulse Telephony.

1) A 50 cm single channel transmitter with 1 kw peak uses a method of alternate pulse displacement. The pulse repetition rate is 50 kc. This is obtained by taking the difference between a 125 kc and a 100 kc oscillators and feeding it into two separate channels, one being used for fixed pulses and the other phase modulated by the telephony or telegraphy, so that its position is varied in relation to the fixed pulse. The resultant pulses from the two channels are combined, amplified and used to overcome the blocking bias on the transmitter oscillator.
The receiver for the system consists of a standard type superheteradyne with video limiting of pulses, the phase variations of which are then converted to amplitude modulation by means of a detector similar to the Foster-Seeley type.

2) A later, modified system on 1.5 meters delivers a 700 watt peak power with only 5 tubes in the phase modulator.

3) Development is proceeding on a four channel system using a synchronizing pulse to gate a voice train and filters to separate the channels.

f. Pulse Telegraphy.

1) A three channel telegraphic system on 12 meters, utilizes repetition rates of 400, 600, 800 pps, all modulating the carrier of the transmitter and being received by tuned filter type receivers. This is intended for a tank or automobile.

g. Radioteletype System.

The teletype transmitter originally intended for operation on 54 meters is operated on 1.75 meters. The usual mark and space signals of the teletype printer are differentiated from 20 milliseconds to 2 milliseconds then fed into an inductance circuit, the surge of which is used to modulate the

Reproduced from the Unclassified / Declassified Holdings of the National Archives

DECLASSIFIED
NHB 76218
Authority
By LT NARA Date 6-4-14

transmitter with a 2 microseconds pulse.
The receiver limits the received pulse then integrates it to a 20 microseconds pulse which operates a sensitive relays that restores the original mark and space characters and operated a standard teleprinter.
This system has been tested successfully over an 8 to 10 km range but it is felt that much greater ranges can be obtained.
The prototype is now ready for production.

4. Members of the Inspecting Party.

Captain James Z. Menard
Mr. E.G. Pack
Mr. L.L. Farkas

Reproduced from the Unclassified / Declassified Holdings of the National Archives

DECLASSIFIED
NHB Authority 760218
By LS NARA Date 6-14-94

28-31 October 1944

II VISSEAUX 1/189
22 Rue Berjon, Lyon-Vaise

1. Sources of Information:

A. Persons Interviewed: M. Visseaux, Director
M. DeBaty, Chief Engineer
M. Kopp, Engineer
M. Wild, Engineer

B. Components Inspected: German tubes brought back from Germany by M. DeBaty

2. Information Obtained on German Sponsored Activities.

A. In January 1943, the Germans gave Visseaux an order for 80,000 tubes of the Lorenz RL 2,4 P2 and RL 2,4 T1 types.

B. M. Kopp, who had visited the Lorenz factory in Mullen, stated that the Germans were planning 50 watt triode and pentodes to operate on 50 cm to 2 meters. This tube will have an enamel glass seal.

C. The Germans were very interested in the manufacture of 954 and 955 type tubes already under production by Visseaux for the French military authorities. None of these tubes were delivered to the Germans.

D. During a visit to Germany, M. DeBaty managed to secure a sample of each of the following tubes:

RL 2.4 T1	RG 12 D 3	LD 1
RL 2.4 P2	RG 12 D 60	LD 2
RL 12 T2	LG 1	LS 1
RV 2.4 P 700	LG 3	LV 1
RV 12 P 2000	LG 4	LS 2

E. Photostats of detailed tube data sheets on the following tubes were also received:

Telefunken LD 1	Triode for decimeter band
Telefunken LD 2	Transmitting triode for decimeter band
Telefunken LG 1	Dual Diode for decimeter band
Telefunken LG 3	H.V. Rectifier
Telefunken LG 4	Dual diode for special work
Telefunken LS 1	Pentode
Telefunken LS 2	Pushpull triode for transmitter and low frequency, output stage.
Telefunken LV 1	Pentode foi broad band amplifier
Telefunken RG 12 D 60	Full wave rectifier

Reproduced from the Unclassified / Declassified Holdings of the National Archives

DECLASSIFIED
NHD 760218
Authority
By LT NARA Date 6-7-14

Property of The Industrial
College of the Armed Forces

Telefunken RL 12 T 2 L.F. Triode
Telefunken RV 2.4 P 700 H.F. pentode
Telefunken RV 12 P 2000 H.F. pentode
Telefunken RV 12 P 4000 H.F. pentode
Lorenz RL 2.4 P 2 H.F. pentode
Lorenz RL 2.4 T 1 H.F. triode

Of the above data sheets, the first seven were considered most significant and are included in this report.

Reproduced from the Unclassified / Declassified Holdings of the National Archives

DECLASSIFIED
NHD 76218
Authority
By LT NARA Date 6-14

29-31 October 1944

III ESTABLISSMENT CARTEX, ANNECY, HAUTE SOVIE

59 Ave Felix-Faure, Lyon

1. Source of Information

A. Persons Interviewed: M. George Friedricks, Manager
M. George Nissen, Engineer
M. Alix Nissen

B. Equipment Inspected: German Wave Meter, 117 to 133 mc, B.V.A.
F.M. 300 A.P.P. No 31124

This firm had considerable contact with Germany and information was obtained concerning German Radar Activities, the location of manufacturers and research facilities, the effect of Allied countermeasures and some indication of German knowledge regarding Allied Radar.

2. Information Obtained on German Sponsored Activities.

A. In May 1943, the Germans approached the firm of Cartex concerning the production of an R.F. bridge which had been designed by Siemens. M. Friedricks and M. Nissen went to Berlin to discuss the question of production with German Air Force authorities. Lt. Herbert Kopler, a German Radio Technician with two years experience in research on German Coast Chain Equipment, who was attached to A.S.T.S (Wasserman Research) stayed for three months at Annecy to assist in production of the R.F. bridge. In March 1944 Cartex was requested to undertake development of a Signal Generator and M. Friedricks and Nissen again visited Berlin for conferences with German Air Force Headquarters and later in March visited a German Research Laboratory in Munich. M. Friedricks and Nissen speak excellent German and from their visit and their associations with Lt. Kopler, obtained considerable information. M. Nissen in April 1944 transmitted a report to the Annecy, F.F.I. authorities for transmission to London. It is not known whether this report reached London, so all information obtained from M. Nissen is forwarded in this report.

B. The R.F. bridge of which the Germans requested production was to work at frequencies between 2 and 4 meters. A prototype of this bridge, made by Siemens at Berlin, was brought to the Annecy factory by Lt. Kopler who came in March 1944 and left in June 1944 with intentions of returning. As he never returned, his samples were left with Cartex. In conversations with M. Nissen it was learned that the need for this bridge arose because Allied use of "Window" had effectively jammed the German 50 - 60 cm radio chain but had little effect on the operation of German Radar operating in the 2 - 4 meter band. Consequently the Germans decided to expand the 2 - 4 meter coverage and in August 1944 were expecting to put into service new stations

Reproduced from the Unclassified / Declassified Holdings of the National Archives

DECLASSIFIED NHD Authority 960218 By LJ NARA Date 6-11-96

with six push button frequencies between 2 - 4 meters. The stations were equipped with broad band antenna systems and the bridge was necessary to facilitate a rapid matching of the complicated Wasserman antenna. The original Siemens model of the bridge used a crystal detector. This had to be changed to a diode because the sole German Crystal manufacture, a small specialist in Berlin, had his plant destroyed by British bombing. Cartex delivered to the Germans a prototype of the bridge but no production models were furnished. (Details of this bridge can be procured upon request at this office).

C. Lt. Kopler described three types of Wasserman stations and said the equipment in each was identical except the towers. Height information was obtained by a shifting of the vertical polar diagram with hand control. The hand control varied the elevation angle of the beam by varying the relative feed lengths to the upper and lower bays of dipoles in the Wasserman antenna. Reflector switching at 50 cycles per second was employed to secure a form of split on the horizontal beam to assist in more accurate D.F. Maximum range of the Wasserman was claimed to be 500 KM under occasional conditions.

D. Lt. Kopler in conversation with M. Nissen, displayed a considerable knowledge of Allied radar activities and countermeasures. He mentioned that the Allied employed spot jamming in which the radar frequencies were located and jamming signals placed thereon and commented that this was extremely effective. He described the essential features of the British Mark 8 A.I. saying that it employed a spiral scan and operated in centimetric band. He also mentioned the H2S system of blind bombing, saying that he did not know the circuit details but he mentioned, however, seeing a German Staff film describing the H2S method. He said that our planes were guided to the general vicinity of the target by "crossed beams" which the Germans had been unable to jam. We then used the H2S for exact location. The results were said to be extremely effective. We were thought to be using a method of spacing planes in formation at night, but the Germans believed they had effectively jammed this system.

Lt. Kopler also described a German A.I. set thought to be in the 40-60 cm band which employed a display with a circular sweep giving a spot indication of the target. This equipment was said to have a maximum range of 15 KM and a range accuracy of plus or minus 10 meters. As M. Nissen had also heard the British A.I. system described, there is a possibility that the above German A.I. system may have been confused with the British Mark 8 A.I. or Lt. Kopler may have mistaken the German centimeter research receiver for the German A.I. receiver, he described.

E. In March 1944, the German Air Force requested Cartex to produce 500 Signal Generators for 2-4 meters and asked them to study the development of a centimeter signal generator. The exact frequency of it was not specified. It was in connection with this project that M. Friedrick and Nissen went to Berlin in March 1944 and later in March

Reproduced from the Unclassified / Declassified Holdings of the National Archives

DECLASSIFIED NHD Authority 760218 By LS NARA Date 6-14

to the Munich Laboratories of Rhode and Schwarz to study German Signal generators. The firm of Rhode and Schwarz was said to be the principal centimeter research establishment in Germany. The plant was located in Munich and in March 1944 had not been damaged by bombing although factories around it had been destroyed. M. Nissen talked with Dr. Rhode and Dr. Schwarz who expressed regret that their research efforts were directed toward military developments which they felt were of no peace time use. Messrs. Friedrick and Nissen were shown a Signal Generator going down to 25 centimeters and were informed by Dr. Rhode that 5 centimeter equipment was in production while much shorter wave lengths were used in the laboratories. Personnel of Rhodes and Schwarz frequently mentioned Klystrons but nothing was ever said about Magnetrons. Components of centimeter equipment were briefly shown. These included coaxials, resonant cavities and M. Nissen believed that he was shown sections of cylindical wave guides. Cartex never started production of the wavemeter, but during development was asked to extend its coverage down to 1.2 mc, possibly indicating a spread of Wasserman frequencies.

F. M. Nissen also learned that the Germans used for Carrier Telephony, a coaxial cable with a 100 kilocycle carrier providing 30 telephone channels. As many as 90 teleprinters were worked over one telephone land line. Standby facilities were provided using radio relays thought to be in the decimeter band. These were spaced approximately 40 kilometers apart. These facilities which had been used in Russia were thought to be in use over most of Germany.

G. When the Germans announced that flying bomb attacks on England had begun, Mr. Nissen asked Lt. Kopler what he thought about the bombs. Lt. Kopler described it as a bomb which carried a television device to send back to the control station, a view of the terrain over which it was passing. The control station then effected direction by means of frequency modulation. The particulars including frequencies were not mentioned by Lt. Kopler.

H. Particulars on German personnel, plants and organization:

Wasserman research was conducted principally by A.S.T.S. which was located at Kladow, between Berlin and Pottsdam. Sometime in 1944 this organization was evacuated to Sofia, Bulgaria. Wasserman depot stores for all of Europe, were kept at Milan, Italy. The sole German manufacturer of crystal detectors was a small specialist in Berlin. His plant was entirely destroyed by bombing. Centimeter research work was done by Rhodes and Schwarz at Munich while there werethree manufacturers who were concerned only with production of centimeter equipment. One of these was a Siemens Berlin factory which was badly damaged by bombing. The Siemens centimeter plant was then evacuated from Berlin to Wohlau, Bohemia where another centimeter manufacturer was also located. A German Air Force Liaison Officer stationed at Rhode and Schwarz in Munich frequently made visits to a centimeter manufacturer located 40 kilometers outside of Munich but the exact location was never disclosed.

Reproduced from the Unclassified / Declassified Holdings of the National Archives

DECLASSIFIED
NHD 760218
Authority
By LT NARA, Date 6-14-74

Personnel in Berlin who were concerned in the procurement of equipment from Cartex included Von Wrangel who for a time was a special controller for Seider in Paris. Lt. Lehneper of LNVV and Capt. Fichtner of ReM deceased due to typhus contracted after bombing of Berlin.

3. Members of Inspecting Party

At Annecy: Captain James Z. Menard

At Lyon: Captain James Z. Menard
Mr. L.L. Farkas

Reproduced from the Unclassified / Declassified Holdings of the National Archives

DECLASSIFIED
NHB 760218
Authority
By LT NARA Date 6-7-74

30 October 1944

IV TEPPAZ 13 bis rue Jarente, Lyon
Tel: F 57-28

Small factory of 40 persons manufacturing radio amplifiers, phonograph pick-ups and turn-tables.

1. Sources of Information

Persons Intervied: M. Teppaz

2. Information obtained on German Sponsored Activities.

The Germans placed an order with Teppaz for 15 watt amplifiers used with 16 mm projectors. These were to be used for propaganda in Russia.

Electrophones were also ordered but were not delivered. M. Teppaz knew of trials conducted at St Raphael with 500 and 1,000 kilo radio-controlled bombs and claimed that an accuracy of 100 meters was reached. Two methods were used: 1) The bomb dropped by the bomber was controlled by the bomber. 2) The control of the bomb dropped by the bomber was taken over by a nearby fighter plane.

Control was affected by means of a transmitter in the plane and a radio transmitter-receiver set in the bomb. This was maintained until the bomb was headed for the target. M. Teppaz thought pulse transmission was used. He also indicated that three radio controlled bombs had been left in St. Raphael but that two of these had been destroyed. The third is supposed to have been taken intact to Algier by the Franch Navy.

M. Teppaz stated that M. Salles, inventor of the radio-controlled bomb had been taken to Germany.

3. Members of the Inspecting Party.

Mr. E. G. Pack
Mr. L. L. Farkas

V. REVERDY (Previously Juhel-Reverdy) 30 October 1944

161 Route National, Bron-

1. Sources of Information

Shop of 3 or 4 employees making broadcast receivers, relays and machine parts.

Persons Interviewed: M. Reverdy

Reproduced from the Unclassified / Declassified Holdings of the National Archives

DECLASSIFIED
NHD 760218
Authority
By LT NARA Date 6-7-14

2. Information Obtained on German Sponsored Activities: NONE

VI JUHEL

19 Rue Dahmel, Lyon Tel: F 23-92

1. Sources of Information

Shop employing 5 persons, manufacturing broadcast receivers.

Persons Interviewed: M. Juhel

VII LA JUGIE 34 Rue Antoinette, Lyon Tel: V 73-37

1. Sources of Information

Small firm of 5 persons making audio amplifiers and signal generators.

Persons Interviewed: M. La Jugie

2. Information Obtained on German Sponsored Activities: None

VIII SOCIETE OMEGA 13 Rue de Songieu, Lyon Tel: V 89-90

1. Sources of Information

Factory of 100 persons making R.F. and I.F. coil assemblies, measuring equipment and mica condensers.

Persons Interviewed: M. Fisz, Engineer in Charge
M. Gamet, M. Noerand, M. Carrel

2. Information Obtained on German Sponsored Activities: NONE

IX RADIO-CONTROLE 141 Rue Boileau, Lyon Tel: L 43-16

1. Sources of Information

A factory of approximately 70 persons manufacturing test equipment for the radio service man.

Persons Interviewed: M. Doelfus, Chief Engineer

2. Information Obtained on German Sponsored Activities: NONE

X AMPER 54 Rue S. Gryphe, Lyon Tel: P 36-04

1. Sources of Information:

Electric meter factory of approximately 50 persons

Persons Interviewed: M. B.Roux, Director

Reproduced from the Unclassified / Declassified Holdings of the National Archives

DECLASSIFIED
Authority NND 760218
By LT NARA, Date 6-14-14

2. Information Obtained on German Sponsored Activities: NONE

XI IDEAL RADIO 97 Avenue de Saxe, Lyon Tel.: M 82-81

1. Sources of Information:

Firm of 6 persons assembling broadcast sets and production test boards.

Persons Interviewed: M. Gamel, M. Morrand, M. Carrel

2. Information Obtained on German Sponsored Activities: NONE

XII SOCIETE S.A.I.P.E. 54 Crs Morand, Lyon Tel: L 20-79

1. Sources of Information:

Plant of 30 persons manufacturing photo-electric cells and fungar bulbs.

Persons Interviewed: M. Jernadvuinet, Director
M. Churg, Engineer
M. Najnudel, Engineer

2. Information Obtained on German Sponsored Activities.

M. Churg stated that he had worked for the Societe Professionel Radioelectrique, in Boulogne-Billiancourt, Seine, who had constructed the high frequency portion (transmitter) used in radio controlled bombs. On trials in 1940 that he had witnessed, the bomb developed the defect of spinning but it was then felt that this could be remedied easily.

The bomb, carried beneath the plane, was released at 10 km from the target and could be accurately controlled to its destination. M. Churg added that they had successfully controlled the bomb at distances up to 30 km. The frequency used was 130 meters (this was probably 130 mc) frequency modulated. This project was sponsored by the German Navy.

M. Churg also stated that De Roumefort et Cie, St Ouen, Seine, was the company that invented the system. (A check disclosed that the Societe Professional Radioelectrique moved to 8 Rue Perchpinte, Toulouse in 1940).

Reproduced from the Unclassified / Declassified Holdings of the National Archives

DECLASSIFIED NHB 760218 Authority NARA DATE 6-14

XIII SOCIETE BONNIER

20 Rue St Gilbert, Lyon Tel: P 2409

1. Sources of Information:

Factory of 45 persons making special AC and DC meters and alternators mostly for laboratories. Also telegraph system for PTT

Persons Interviewed: M. Chapues, Director.

2. Information Obtained on German Sponsored Activities: NONE

XIV LES CABLES DE LYON 172 Avenue Merchal Lyantey, Lyon, Tel P 3561

1. Sources of Information:

Persons Interviewed: M. Forest, General Director
M. Pelletier, Assoc. General Director
M. Pertet, Commercial Director
M. Damenach, Chief Engineer

Facilities Inspected: Wire factory comprised of four units, employing 1500 to 2000 persons: Laboratory, Insulation Plant, R.V. Transmission cable plant, commercial Telephone Cable plant.

2. Information Obtained

Organization and Affiliates: Cables de Lyon is part of the Compagnie General d'Electricite whose offices are at 54 rue de la Boetie, Paris, Tel: ELy 2441. It produces rubber covered wire and cable at the Lyon and Bezon factories, telegraph and telephone cables also at Lyon, submarine cable at Bexon and amor for submarine cables at Calais.

German Sponsored Activities: The Calais plant has been heavily damaged by the Germans. The Lyon plant was systematically sabotaged presumably by exper German competitors.

Independent French Activities: The French have replaced all damaged equipment with once discarded hand machines to put the plant back into operation.

3. Members of the Inspecting Party: Mr. E.G. Pack

XV POSTES TELEGRAPHIQUES ET TELEPHONIQUES LaDoua, Lyon

1. Sources of Information

Persons Interviewed: M. Ballay, Chief Engineer
M. Carreaux

Reproduced from the Unclassified / Declassified Holdings of the National Archives

DECLASSIFIED NHD Authority 760218 By LT NARA, Date 6-14-14

Long and short wave radio broadcasting station.

Equipment Inspected: German communication and direction finding equipment gathered by the PTT from surrounding forts.

2. Information Obtained on German Sponsored Activities:

The equipment inspected was standard communication equipment while the direction finding apparatus was of ancient origin. No significant information was derived from this visit.

XVI SOCIETE FRANCAISE RADIOELECTRIQUE 1/19(b) 1 November 1944

131 Avenue Felix-Faure, Lyon Tel: M 2566

1. Sources of Information:

Factory of 150 persons making radio broadcast transmitters, telegraph transmitters, commercial receivers, rectifiers, antenna tuning systems.

Persons Interviewed: M. Testeven, Director
M. Malcalloz, Production Chief
M. Teussaint, Research Director
M. Sevo, Receiver Engineer

Equipment Inspected: 2 kw telegraphic transmitter, various French Transmitters and receivers, one type 850-A Italian car installation consisting of 3 transmitters and 3 receivers on 68 to 136 meters, also a German pack receiver working on frequency between approximately 2 and 10 meters.

2. Information Obtained on German Sponsored Activities: NONE

XVII LA RADIO INDUSTRIE 2-6-7 November 1944

Grande Rue St Clair, A Caluire

1. Source of Information

Persons Interviewed: Lyon, 2 November 1944
M. de Ligennes, Director General
M. Fagon, Engineer on FM
M. Corbon, Engineer on Pulse Transmitters and Amateur Transmitters.
M. Lessiou, Television Engineer
M. Courbes, Assistant Engineer
Paris, 6-7 November 1944
M. de France, Chief Engineer (at Ministre of Production Industrielle)
M. Recard, Technical Adviser, (at Serbonne)

Reproduced from the Unclassified / Declassified Holdings of the National Archives

DECLASSIFIED
NHD 760218
Authority
By LJ NARA Date 6-7-14

Facilities Inspected: Laboratory employing approximately 150 persons. This firm is moving back to Paris. It is the laboratory for the manufacturing firm Societe Outillage R.B.V. Paris, 13 Passage des Toureles.

2. Information Obtained on German Sponsored Activities:

Radio Industry was asked by Germans in July 1943 to study construction of a television video indicator which was to be sturdy able to withstand shock and capable of operating at altitudes of 12,000 meters with temperature variation of plus 40 to minus 30 degrees centigrade. The display was to use a 5 inch cathode ray tube with very fine definition. This was considered a very secret project and a German Engineer spent considerable time with the company. Contacts were had with Dr. Neiss, television expert.

Information was also divulged regarding a German order for a transmitter on 5 - 10 meters. This device was to use a iconoscope, and a vague request for its development was made to both Radio Industry and to S.T.S. at Clermont Ferrand.

In July 1943 the Germans requested the Radio Industrie Engineers to continue a development of a two-way television system for plant to ground installations, this project was never completed.

Radio Industry also produced for the Germans a police radio installation operating on 110 meters.

M. Recard, when interviewed at the Sorbonne in Paris stated that he had received information while in Algiers that the Germans had search receivers (crystal detectors and amplifiers) on bands of 1.2 to 2 m, 1.2 to 3 m, 80 cm to 3.20 m, 8 cm to 3.20 m and 3 cms.

3. Independent French Activity:

The following radio equipment and systems are in various stages of development:

Television transmitter and receiver set, airborne and ground, for two way television system. Amplitude modulation, fm for synchronization. This system will be ready for test in a short time.

A television receiver 36 Mc-Pulse transmitter on 100 mc using a 1/4 microsecond pulses at PRF of 25-50 cps and receivers located at various synchronized stations are used to record results photographically. This research is carried on by the Reverand Pere LeJay (Jesuit of ZiKaWei).

A pulse altimeter system using 1-1.5 Microsecond pulse. Receiver has a 6 mc band width.

A frequency modulated rack for operation between 40-50 mc.

Reproduced from the Unclassified / Declassified Holdings of the National Archives

DECLASSIFIED NND 760218 Authority By LT NARA Date 6-14-76

None of this equipment was of professional quality.

4. Inspecting Party: Captain James Z. Menard
Mr. E.G. Pack
Mr. L.L. Farkas

2 November 1944.

XVIII SOCIETE DES LAMPES FOTOS 1/210

160 Route d' Heyrieus, Lyon P 75-05

1. Source of Information:

Persons Interviewed: M. F. Grammont
M. Savegnier, Administrative Director
M. Chassain, Receiving tubes
M. Brelley
M. Lafargue, Transmitting tubes

Facilities Inspected: The receiving tube factory, a small plant for the hand production of large transmitting tubes and an electric bulb factory. The entire factory covered a space of approximately 13,830 square meters of a factory area of 29,467 square meters. The factory is an affiliate of Societe des Telephone Grammont in the Paris area.

2. Information Obtained on German Sponsored Activities:

This company manufactured R.V. 12 100,000 type tubes for the Germans in association with Opta Radio. The Germans wanted 25,000 from the Lyon Factory and 25,000 from the Paris Factory. It was learned that the Opta Factory in 1943 had 3,500 employees and turned out 70,000 R.V. 12 P 2,000 tubes per month. They also produced receivers. In 1943 the Opta tube factory was moved from Berlin to Gruenberg, Silesia. Dr. Kapeyten of Leewe Radio, visited Grammont in an attempt to expedite production.

3. Members of Inspecting Party: Captain James Z. Menard
Mr. E.G. Pack
Mr. L.L. Farkas

NOTE: The following targets were investigated to complete information introduced in the Lyon Area.

6-8 November 1944.

XIX RENARD ET MOIROUX

11 Rue de Trianon, Le Perroux, Seine, Tel: TRE 24-15

Factory of 100 persons making receivers and component parts.

Reproduced from the Unclassified / Declassified Holdings of the National Archives

DECLASSIFIED
NHD Authority 960218
By LT NARA Date 6-14-96

1. Sources of Information:

Persons Interviewed: M. Moiraux, Director M. Jouenne
M. Vivet, Chief Engineer M. Chilloux

Equipment Inspected: A pulse jammer labeled "Olga II" working on 168 to 222 mc made by Blaupunkt-Werke G.m.b.H. and nomenclatured B400UK 43. This jammer consists of:

a) A pulse unit, SK 17253, generating pulses on 3 frequencies:
Band I 850 - 950 kc
Band II 650 - 750 kc
Band III 450 - 550 kc
These frequencies are wobbulated at 50 cps plus or minus 5%.

b) A HF portion, SK 17251, comprising an oscillator section and a frequency control tube. The latter was added to the chassis after the equipment arrived in Germany. The power output into the antenna varies between 150 and 200 watts. The oscillator is grid tuned by circular lecher wires shorted by a slider. Frequency control is effected through a diode whose plate is tuned by a cavity resonator coupled to the transmitter tube grid. Pulse modulation is effected by unblocking the transmitter tube grid.

c) A power supply, SK 17252, of standard construction. The tubes used are as follows:
RV 12 P 2000 LV 1
RL 12 T 1 LS 50
RV 12 P 3000 RG 12 D 300
LG 4 RG 62
Data on the above tubes are used in the Olga II equipment as well as schematic diagrams and drawings of the equipment have been secured and turned over to the Radio Countermeasure Branch.

2. Information Obtained on German Sponsored Activities.

a) In August 1943, the firm of Renard et Moiroux was ordered to build 100 pulse jammers "Olga II", the original prototype was destroyed in the August Berlin bombing and had to be rebuilt. It was furnished to Renard et Moiroux in December 1943. Only one model was delivered to the Germans.

Of the total order of 300 jammers, 100 were to be constructed by the Blaupunkt werke branch in Dresden and 100 by their branch in Kolin on the Elbe. The complete German prototype had been given to Commandant Portail of the French Navy Ministry.

M. Vivet who had gone to Dresden on the above project stated that the Germans were working on a similar type jammer to work on 200 to 300 mc.

Reproduced from the Unclassified / Declassified Holdings of the National Archives

DECLASSIFIED
NHB 760218
Authority
By LJ NARA Date 6-14-14

b) Information on the company Blaupunkt Werke GmbH, gathered by M. Pelikan, M. Richert and M. Vivet of Renard et Moiroux, as of January 1944 included the following points:

1- General Technical Direction is under Dr. Goertz who also directs the Organization Committee of German Radio.
2- Dr. Brush is Technical Supervisor of the company branches.
3- Construction of laboratories is under Dr. Cullmer who, on December of 43, received a prize of 50,000 reichmarks for exceptional services.
4- The main factory is located at 9/13 Forchenbeckstrasse, Wilmersdorf, Berlin and occupies about 32,000 square meters. It is bound on the north by the railroad of S. Bahn near the station of Schmargendorf and on the east by Power plants. It includes the administration, laboratory, research bureaus as well as large factories of which 2/3 were destroyed in March 1943. These have been replaced by small buildings. There are about 2,000 persons employed in this place.
5- Plant #2 is at 154 Kopernicker Strasse in the eastern part of Berlin. It employs 600 persons and is directed by Mr. Kirsekorn. This factory makes component parts and in January 44 began construction of an equipment called "KUHN" on which no data was gathered. A laboratory makes test apparatus for all the branches of the company.
6- The Treptow branch is located at Am Treptower Park No. 20 in an old rug factory. Direction of 200 persons is under Mr. Gernitz. Paper condensers are manufactured.
7- The Cologne factory has been moved.
8- The Leipzig factory was destroyed by bombardments.
9- The Dresden factory called: Versuchstelle Blaupunkt employs 50 persons and is located at 18 Blasewitzerstrasse, Dresden A 18. Prototypes as well as shielded telephone junction boxes arebuilt here.
10- The Reichenberg, Sudeten, factory was equipped during 42 and is directed by M. Menzel. It manufactures spark plugs anti-parasitic resistances for the firm of Besch in Stuttgart.
11- The Kolin on the Elbe branch is the factory of Ideal Radio established in Czechoslovakia. Its manufacture includes receivers called "Ostland", HF blocks for receivers, "Rudi" and "Olga II" equipments.
12- The Litzmannstadt, Cologne, Branch made receivers and power supplies for the Olga equipment.

c) M. Jouenne, and M. Cailloux, technician and draftsman for Renard et Moiroux were taken to Germany where they worked for the Firm HUTH Apparatefabrik GmbH in Hannover. Both men returned to France in March 1944 and escaped. The information they presented about this and other Germany firms follows:

The Firm HUTH, Apparatefabrik G.m.b.H. in Hannover produced:

Reproduced from the Unclassified / Declassified Holdings of the National Archives

DECLASSIFIED
NHD Authority 760218
by LT NARA Date 6-14-76

1. FUG 102 Equipment:
   This is a radio altimeter on 1.67 meters, modulated by a quartz oscillator on 29.5 kc. A converter supplies 1200 volts from a 24 volt battery. The indicator, graduated in hundreds of meters has an olliptical sweep. The graduations are from 200 to 500 meters. The transmitter and receiver are standard, the receiver having 8 stages of IF on 25 mc. A doublet type antenna is used. This set is a copy of a model "Phillips".
2. A receiver for tanks, type "Dora" on short wave.
3. Aircraft receiver FuG 10 on long wave from 500 to 1000 meters and short waves from 50 to 100 meters.
4. Receiver BX 6, modern type replacing the old BX 2. This is a radiogoniometric receiver working on the bands 150 to 300 kc; 300 to 600 kc; 600 to 1200kc.

HUTH is located in the section called "Riklingen" in the south-west of the city at Hannover Linden Gottinger Chaussee 76. This factory, built in 1940 employs approximately 3500 employees, forty of which were so-called "FREE" French, Belgian, Dutch, Italians, etc-- and a hundred of young Russians of both sexes. Part of the company (heavy machinery) has been moved to Werdau, near Leipzig. The coil plant has been moved to Weltershausen about a 100 km southeast of Hannover.

The Director and important persons of the company are:

Herr Seatz, General-director
Herr Romeike, Technical director
Herr Helleman, Personnel Chief
Herr Wahle, Assistant Director
Herr Rade, Chief of Services EZ 6
Herr Sprecht, Chief of Service FuG 10
Herr Lindermann, Chief Test Department
Herr Schenck, Chief Test Department for measuring equipment
Herr Claussen, Engineer
Herr Gerke, Technician
Herr Westo, Technician

The main factories of Hannover and their locations are:

1. Firma Leichmetal
   Hannover Linden, Gottinger Chaussee 71, corner of Schlorumogeweg and Gottinger Chaussee.
2. Firma Edelwerke
   (heavy machinery) corner opposite to the Precidente.
3. Firma Hanomap
   Heavy machinery, cars, etc--corner Gottinger Strasse and Hamelnerstrasse up to the railroad line (station of Fischerhof).
4. Firma Continental
   Synthetic and reclaimed rubber factory located in the Polygon of Philipbornstrasse, Kopernickerstrasse, Freight depot of the railroad station of Guterbanof.

Reproduced from the Unclassified / Declassified Holdings of the National Archives

DECLASSIFIED
NHD Authority 960218
By LS NARA Date 6-14-96

XX. ORDNANCE DEPOT NO. 0-644 — 15 November 1944

Vincennes, Seine

1. Information Obtained

a. In order to investigate a statement that the French had captured V1, V2 and V3 bombs, M. Natta and M. Bellon of the French Ministere of the Navy and M. Giboin of the Industrial Production attended a meeting with the undersigned at the Signal Section Hq, Com-Zone, 26 Avenue Kleber, Paris, on 11 November 1944.

b. M. Natta and M. Bellon stated that the French had a V1, complete except for the electrical starting connections, Parts of a V2 and a semi-complete HS-293 which they called a V3. Discussion brought out that the V2 was very incomplete and had no radio equipment but that M. Natta and M. Bellon had inspected V2's at the Vincenne Ordnance Depot in company with Dr. Woodruff and that much of the Radio-control equipment was still intact.

c. Dr. Woodruff was contacted at the Marignan Hotel, in Paris, on 12 November 44. He said that he had seen some of the radio equipment and suggested that the parts be checked at the Vincenne Ordnance Depot.

d. On the 15 November 1944, Lt. Dustin and Mr. L.L. Farkas visited the Ordnance Depot No. 0-644 at Vincennes. Parts of V2 type bombs were seen but there was no radio-control equipment left. It was discovered that the parts seen by Dr. Woodruff had already been transmitted to Aberdeen.

2. Members of Inspecting Party:

Lt. Dustin
Mr. L.L. Farkas

XXI DEROUMEFORT AND CIE — 16 November 1944

28 Rue Alphonse Helbranner — Tel: CLI 0556

1. Sources of Information:

Persons Interviewed: Capitaine de Fregate Hurel
M. Turc
M. Bougault

(Also present at this meeting held at the Ministere of the Production Industrielle, 66 rue Belle-Chase, Paris, were M. Giboin, Chief Engineer for the Directions des Industries Mecaniques et Electriques and M. Sabine, Chief Engineer of the Genie Maritime of the Ministere de la Marine, Bureau Aeronautique).

Reproduced from the Unclassified / Declassified Holdings of the National Archives

DECLASSIFIED
Authority NND 760218
By LT NARA Date 6-14-14

2. Information Obtained:

a. M. DeRoumefort had experimented with radio-controlled bombs before the occupation of France.

b. When the Germans came into France, Captain de Fregate Hurel, M. Bougault and M. Turc, who did not agree with M. DeRoumefort's ideas left the company. M. DeRoumefort offered his services and what he had kept of the equipment (presumably the transmitter) to the Germans. The company continued work for the Germans until the liberation.

c. At this time, the whereabouts of M. DeRoumefort is unknown.

d. M. Turc stated that the bomb control system used in 1940 utilized frequency modulation on a band of 3.2 to 3.6 mc with a 50 kc carrier. Control of range, height and azimuth were effected by continuous control means that permitted a 0.5 degree accuracy with the controlling transmitter on the ground 25 km away. Line of sight was mostly used. While M. Turc did not reveal all details of the system, he added that the antenna used were not very directional and that transmission can not be easily jammed.

e. It was ascertained from M. Giboin and M. Sabine that details of the above system could be secured by addressing a request to the Ministere de la Marine, Directeur Control des Constructions at Armies Waveles, 2 rue Royal, Paris.

f. Capitaine Hurel knew about the three radio-controlled bombs in St. Raphael and stated that they had all been destroyed, including one that had been taken to Algiers by the French Navy.

g. Capitaine de Fregate Hurel also stated that he had visited the Zeppelin plant at Friedrichshafen in July 1943. This plant seemingly run by the son of Hugo Eckener, was manufacturing paraboloid sectors 6 to 8 meters in diameter. The plant was partly destroyed by bombing that followed.

3. Members of the Investigating Party:

Mr. L. L. Farkas

Reproduced from the Unclassified / Declassified Holdings of the National Archives

DECLASSIFIED
NHB 76218
Authority
By LT NARA Date 6-7-74

LORENZ

Translation of Data on RD 12 Ta

Triode for decimetric wavelengths. (Temporary publication of the 15/5/41).

The data necessary for the Wehrmacht orders must be taken from the tube data sheets RD 12 Ta Tb 24 B (Publication of the O.K. H. of 21/2/42).

1) Heater Constants
Heater Voltage 12, 6 volts
Heater Current, 80mA
Oxyde Cathode Indirectly heated.

2) Maximum Values.
Plate Voltage, 300 V.
Surge Voltage, 450 V. (Static)
Grid Voltage (Maximum) 30 V. - 200V.
Grid Voltage (Static) 200V
Plate Dissipation, 5"
Power loss in the Grid, 0.5 W.
Cathode DC current, 30mA.
Lilamentcathode Voltage, 75 V.

3) Capacities
C. Grid-cathode, 1.5 PF
C. Grid-plate, 10 PF
C. Plate-catnode, 0.3 PF
C. Filament-cathode 20 PF

4) Characteristics
For a plate voltage, 100V.
Grid Voltage 0V.

There is:
Plate current, 24 Mils
Trans-conductance 6mA/V
Amplification factor, 20

5) Plate A.C.
For a plate voltage of 100V.
Grid bias - 12 V.
Results in a plate current, 1 mA.

6) Action of Grid Current
For a plate voltage of 100V.
Heater Current, 12, 6 V.
Grid Current, 0.3 uA
Results in a grid voltage - 1.5 V.

Reproduced from the Unclassified / Declassified Holdings of the National Archives

DECLASSIFIED
NHD 760218
Authority
By LT NARA Date 6-14-14

L O R E N Z

Translation of Data on --
RD 12 Ga Dual Diode for decimetric wavelengths; Characteristics published the 15/5/41.

Necessary data for the Wehrmacht order, characteristics of tubes RD 12 Ga TL 24 b "7059". (Publication of the O. K. H. of 21/2/42).

1) Heater Constants
Heater Voltage, 12, 6 Volts
Heater Current, 65 mA
Oxyde cathode indirectly heated
Maximum DC cathode current, 2mA.

2) Capacities
C. Plate-cathode. 0.45 pf
C. Plate 1 Plate 2 0.15 pf

LORENZ

RD 2,4 GC Dual Diode for decimetric wavelengths, characteristics published the 15/5/41.

Data necessary for the Wehrmacht order regarding tube RD 2,4 GC 24 b/7058. (Taken from the publication of the O.K.H. of 21/2/42).

1) Heater Constants
Heater voltage, 2,4, Volts
Heater Current, 310mA
Oxyde Cathode Indirectly heated
Maximum D.C. Cathode current, 2mA.

2) Internal Capacities
C. Cathode plate, Approx. 0.45 PF
C. Plate 1 Plate 2, Approx. 0.15 pF