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# ELECTRO - ACCOUSTICS IN GERMANY
# PART 11.

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BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE

LONDON—H.M. STATIONERY OFFICE

# ELECTRO - ACOUSTICS IN GERMANY.

II

REPORTED BY

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B.I.O.S. TRIP 2478 B.

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BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE

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TEAM MEMBER.

T. SOMERVILLE, B.B.C.

# REPORT ON AN INVESTIGATION ON ELECTRO-ACOUSTICS IN GERMANY 30th SEPTEMBER TO 25th OCTOBER, 1946.

This report describes the second visit to Germany to complete the study of German broadcasting.

Visits were paid to the following:

1. Nordwestdeutscher-Rundfunk, Cologne.
2. Sudwestdeutscher-Rundfunk, Stuttgart.
3. Sudwestdeutscher-Rundfunk, Munich.
4. Siemens-Halske, Munich.
5. Sudwestdeutscher-Rundfunk, Frankfurt.
6. Dr. H.J. Von Braunmühl, Bad Homburg.
7. Allgemeine-Elektrizitäts-Gesellschaft, Berlin.
8. Konski & Kruger, Berlin.
9. Reichs-Rundfunk-Gesellschaft, Berlin.
10. Dr. Georg Neumann, Berlin.
11. Allgemeine-Elektrizitäts-Gesellschaft, Hamburg.
12. Physikalische-Technische-Reichsanstalt, Göttingen.

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1. Nordwestdeutscher-Rundfunk, Cologne. 3rd October

Personalities: Mr. Henry
Mr. Rothe

Building has commenced to repair extensive bomb damage but the work is still only in the early stages. There is nothing of interest to report.

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2. Sudwestdeutscher-Rundfunk,
Stuttgart,
Neckarstrasse. 5th October

Personality: Capt. Taylor (U.S.)

New premises were built here because the original premises were completely destroyed and the usual difficulties have been experienced in getting studios equipped quickly. Two new studios of medium size are being built, one with poly-cylindrical treatment and the other with rotating cylinders to provide variable damping. These cylinders are filled with glass wool and have half of the circumference perforated so that as they rotate they change the absorption in the studio. This method has been used in Brussels and it will be interesting to find out, at a later date, if the result is satisfactory.

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3. Sudwestdeutscher-Rundfunk,
Munich,
Rundfunkplatz. 7th October

Personalities: Capt. Matheny (U.S.)
Herr Friedrich Zaekel.

New premises are also being equipped in Munich and several of the studios are being converted from temporary treatment to a permanent basis. A large studio is being built which may be very good. The live and dead end technique is being used, the treatment consisting of slotted panelling backed by glass wool, and solid wood panelling arranged to grade the increase of absorption from the live end to the dead end. A glass roof is in existence but this was considered to be an undesirable feature and it is being covered. It was noticed here that the small studios tended to give "chinky" results on Neumann microphones. Much trouble has been experienced on recording from fluctuation in mains frequency and a special machine made by Hagenuk of Kiel is being installed to provide constant frequency supply to the recording rooms. An accuracy of .5% is claimed. An interesting system for the distribution of programmes throughout the premises was demonstrated. It consists of a dialling arrangement which enables a very large number of programmes to be fed over two lines, and is very flexible.

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4. Siemens-Halske,
Munich,
Hoffmannstrasse. 8th October

Personalities: Herr Schucht
Herr Leopold.

This factory was visited because it is here that Siemens-Halske intend to make the post-war range of electro-acoustic measuring equipment. They are about to produce a limited range of equipment which is given in Appendix 1. and are again making the programme meter which is used throughout German broadcasting. This instrument is also used with a suitable filter and amplifier for making measurements of noise, and as this subject is of great interest we intend to purchase an equipment for comparison tests with other noise measurers. It was learned here that in the Siemens factory at Erlangen calibrated microphones were being manufactured and it was suggested that this factory should be visited.

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5. Sudwestdeutscher-Rundfunk,
Frankfurt,
Escheimer Landstrasse. 11th October

Personality: Lieut. Heinzmann (U.S.)

The large studio here was constructed before the war and is a good design. It is treated entirely in wood panelling of the correct stiffness and having the correct damping to give the desired results. There is a balcony with seats, also seats on the floor for an audience, and the balcony end is treated with slotted plywood with glass wool behind, so that a dead end effect is obtained. The studio gives very good results. There is also a small studio with walls and ceiling not quite parallel which is treated with slotted plywood and has the floor partly carpeted, and this is also good. The remainder of the premises in Frankfurt are damaged and building work is now in progress.

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6. Dr. H.J. Von Braunmühl,
Bad Homburg,
40 Guildensollerweg. 12th October

Dr. Von Braunmühl was interviewed to obtain information on the design of German studios. He confirmed the previous opinion

that the large studio at Hamburg was not built to any known design and the good results it gives are fortuitous. He explained that the large studio in the Reichs-Rundfunk-Gesellschaft building in Berlin had a grille in the ceiling to allow the scund waves to be absorbed by the brick structure overhead. Slotted panelling is used throughout in this studio at levels above about 10 ft. and in some places it is backed with glass wool, but exact details were not available. The large studio in Berlin with variable acoustic treatment consisting of hinged panels, was considered by the Germans to be very good. Similarly the studio with triangular treatment, already mentioned in the first report, was liked and they do not appear to have noticed the deficiencies which are known to exist. He is in favour of poly-cylindrical treatment and considers the most modern method is that used in Copenhagen where the damped Helmholz resonator has been used for bass absorption. He expressed surprise at the criticisms of the Magnetophon and stated that when the original tests were carried out the Magnetophon gave good performance even on wide range loudspeakers. This may or may not be true, but the production models certainly do not reach this standard.

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7. Allgemeine-Elektrizitäts-Gesellschaft,
Berlin. 15th October

Personality: Herr Koenig.

Our opinions of the Magnetophon were discussed with Herr Koenig who accepted the criticism of high hum level and rumble, but in the absence of a wide range loudspeaker was not able to express an opinion as regards distortion at high frequencies. No promise that the Company would do anything to correct the faults was obtained for they are obviously in difficulties from the lack of technical staff.

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8. Konski & Kruger,
Berlin, 16th October
Chausseestrasse 117.

Personality: Dr. Eckmiller.

Konski & Kruger were visited to interview Dr. Eckmiller who has designed a new loudspeaker. This loudspeaker has been tested and exhibits the characteristics known as "disembodied top" The designer has only tested the loudspeaker in the Measurement

Room and on speech, and therefore cannot express an opinion under other conditions. He is firmly convinced that a speech test is the only test necessary and unless he changes his opinions it is very unlikely that he will make a good loud-speaker.

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9. Reichs-Rundfunk-Gesellschaft, Berlin, Masuren Allee. — 16th October

It was not possible to get the permission of the Russian authorities to visit these premises but a visit to a public concert in the large studio was of interest for it became clear that the studio is deficient in the upper frequencies. This is not surprising because the whole of the upper parts of the walls are treated with slotted plywood, even round the stage on which the orchestra is placed, and is the cause of the close microphone technique in use.

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10. Dr. Georg Neumann, Berlin - Schoneberg, Genestrasse, 5. — 17th October

In the absence of Dr. Neumann, Herr Heyda was interviewed. It was learned that a new condenser microphone is being developed. It will have a capsule much smaller than that previously used and because of its insensitivity it will require two stages of amplification in the head amplifier. No details of performance are available because no tests have so far been carried out, but it is claimed that the characteristic will be level to 10,000 c/s. The firm is also manufacturing an improved version of the Pegelschreiber which operates on the same principle but is much more robustly constructed.

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11. Allgemeine-Elektrizitäts-Gesellschaft, Hamburg, Krochmannstrasse 12. — 21s. October

Personality: Herr Schuber.

This factory in Hamburg is also manufacturing Magnetophons

and a visit was paid to explain the faults which we have found to exist. Here again, as in Berlin, the rumble and hum was admitted and they appeared to be willing to try to overcome the difficulties. They are much handicapped, however, by lack of technical staff and test equipment. It is doubtful if they can do anything without the assistance of Military Government, in obtaining the necessary equipment, and they would undoubtedly need some technical advice. This factory seems to be the most likely source of Magnetophons in the near future and every encouragement should be given to them to get into production.

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12. Physikalische-Technische-Reichsanstalt,
Göttingen. 22nd October
Bruder Grimm Allee.

Personality: Dr.Grützmacher.

The only information of importance which was obtained from Dr. Grützmacher was that he had developed a system of "wow" measurement which was published in Akustiche Zeitscrift, January 1940. A copy of this paper is being obtained.

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CONCLUSION

This second visit to Germany confirms the general conclusions arrived at as a result of the previous visit to the British Zone. It is clear that the Germans were building good studios just before the war, an example being the premises at Frankfurt. New studios under construction are designed on modern principles and it will be interesting at a later date to find out if the designs are successful. The equipment being installed in the premises in the British and U.S. Zones follows the normal design adopted in pre-war German broadcasting, but dissatisfaction exists with the present loudspeakers and Neumann microphones although it is only in the British Zone that the design of loudspeakers is in progress. The system known as continuity operation has been introduced in both zones for the same reason that has led to its adoption in Britain. In Munich and Frankfurt a system of programme distribution, using two lines and a dialling system, gives very good results and permits indefinite increase in the number of programmes

available throughout the premises. As regards measuring equipment, the position at the moment is bad but will improve when the manufacturers are able to start development again. It will be worthwhile keeping in touch, for in the next year or so there may be important developments in this field.

TS/EBB

T. Somerville
(T. Somerville)

## APPENDIX 1.

| APPARATUS | TYPE | PREVIOUS DESIGNATION |
|---|---|---|
| Beat Frequency Oscillator 20 kc/s | 9 Rel 3 W 211 a | Rel summ 31 b |
| Standard Tone Generator 800 c/s | 9 Rel 3 W 113 a | Rel sum 24 a |
| Oscillator for Receiver Testing 80 kc/s - 28 Mc/s | 9 Rel 3 W 411 a | Rel send 22 |
| Tone Buzzer 800 c/s | 9 Rel 3 W 111 a | Rel sum 22 |
| Buzzer | 9 Rel 3 W 112 a | Rel sum 12 |
| TMS 6 kc/s | 9 Rel 3 K 111 a | Rel mse 57 (3 KHz) |
| TMS 300 kc/s | 9 Rel 3 K 112/113 | Rel sum 57/Rel Mse 66 |
| Valve Tester | 9 Rel 3 K 311 a | - |
| R-L-C Bridge | 9 Rel 3 R 111 a | Rel msbr 20 |
| Resistance Bridge 300 kc/s | 9 Rel 3 R 211 a | Rel msbr 29 |
| Capacity Bridge 0.01 pF - 10 µF | 9 Rel 3 R 112 a | Rel msbr. 16 |
| Inductance Bridge | 9 Rel 3 R 114 a | - |
| 800 c/s Bridge Attachment | 9 Rel 3 R 512 a | - |
| Tolerance Measuring Attachment | 9 Rel 3 R 511 a | - |
| Volt Amp Meter 20 - 10,000 c/s | 9 Rel 3 U 111a | Rel mse 48 a |