

The following is information derived from a batch of documents relating to Philips activities in Holland which have been received through the Dutch Government.

These consisted largely of descriptions of different types of valves, mostly in German and apparently taken from a Luftwaffe radio handbook, these sheets being headed - "Luftfahrt - Rohre - Telefunken". The valves described were as follows :-

| | | | | |
|---------|----|---|------|-----------------------------------------------------|
| LD | 1 | | | Ultra-short-wave triode for decimeter wave-lengths. |
| LG | 7 | | | Duodiode for decimeter wave-lengths. |
| LS | 2 | | | Gegentaktdiode. |
| LS | 3 | | | Diode triode, |
| LS | 30 | | | Ultra-short-wave triode (obsolete). |
| LS | 50 | | | Transmitter pentode (low frequency amplifier). |
| LV | 3 | | | Pentode. |
| LV | 4 | | | Gegentaktpentode. |
| LV | 5 | | | Tetrode. |
| LG | 3 | | | High voltage mains rectifier. |
| LG | 2 | | | Duodiode. |
| RL | 12 | P | 10 | Amplifier and transmitter pentode. |
| RV | 12 | P | 2000 | High frequency pentode. |
| NF | 2 | | | High frequency pentode. |
| RV | 2 | P | 700 | High frequency pentode. |
| RV | 12 | P | 4000 | High frequency pentode. |
| LS | 4 | | | ? |
| 3 DL | | | | Output pentode. |
| 2 UCH | | | | Triode hexode. |
| 3 DK | | | | Octode. |
| 10 DF | | | | Regulation pentode, H.F. and I.F. |
| 3 DCH | | | | Triode hexode mixer valve. |
| 6 UF | | | | Control pentode H.F., I.F. and L.F. |
| E.F. 22 | | | | ? |
| 8 UCH | | | | Philipsmetall. |
| EE 1 | | | | ? |

| | |
|---------|--------------------------------------------------------------------|
| 4 DL | Output pentode. |
| 2 CF | ? |
| LS 4 | ? |
| LV 13 | Triode (transmitter). |
| LV 1 | Pentode (wide band amplifier, transmitter) |
| 4 UL | Output pentode. |
| 3 UY | Rectifier. |
| 1 UAF | Diode. |
| 7 DF | Regulation pentode, H.F. and I.F. |
| 2 DAF | Diode pentode. |
| EE 14 | ? |
| 1 UA | Rectifier. |
| LG 1 | Duodiode for decimeter wavelengths. |
| LB 1 | Cathode ray tube. |
| LB 2 | " " " |
| LG 4 | Duodiode. |
| LS 1 | Pentode (transmitter). |
| LS 180 | Hochtastriode for ultra-short-wave. |
| LG 10 | Two-phase rectifier. |
| LD 5 | Transmitter triode for ultra-short-wave. |
| LE 7/1E | High vacuum cathode-ray tube with double electro-static deviation. |

Descriptions and/or circuit diagrams for :-

Transmitter receiver for speed boats. Unofficial Dutch report on this, states that its bad electric qualities are not important owing to short range required.

| | |
|--------------------|----------------------------------------------------------|
| Berta I | beam transmitter for aerodromes (Telefunken). |
| Berta II | " " " " " |
| 5-watt | " " " " " |
| KVG 15 L/27 | transmitter. |
| UOR I & II | universal feeding apparatus for H Z L 7 |
| Philips DR 25 b IX | portable short-wave transmitter receiver. |
| DR 32 | Short-wave transmitter-receiver for tanks. |
| DR 38) | Portable wave transmitter receiver for |
| PR 38) | 20-30 k.m. |
| DR 42 | Portable wave transmitter receiver for long distances. |
| DR 83 | Portable wave transmitter receiver for up to 500 metres. |
| DR 84 | Short-wave transmitter receiver for cars. |
| DR 85 | " " " " " " 3 cars or two lorries. |

| | |
|---------------|-------------------------------------------|
| LR 87 | Short-wave transmitter receiver for cars. |
| LR 78 | " " " " " " " " |
| VRK 41/BII | Aircraft D.F. equipment. |
| VR 34 | Ships installation. |
| VR 71S | " " |
| SVC 200 D/45 | " transmitter. |
| BRA 30/20 | Beacon transmitter. |
| SVE 800 1/33d | Ground station. |
| K SVC L5/7 | " " |
| HZL 7 | Receiver for direct amplification. |
| HMZL 340 KL | Super-het receiver. |
| EZS | Beacon (Lorenz) |
| PSHo/B | Blind-landing equipment (Lorenz) |

List of orders in Holland for radio and special valve for Wehrmacht (sometime in 1943).

| | | |
|---------------|---------|----------------------------------------------------|
| LG 1 | 52,000 | |
| LG 1A | 4,000 | |
| LV 1 | 26,000 | |
| NF 2 | 116,000 | |
| NF 2A | 31,000 | |
| RL 12 P 10 | 136,000 | |
| RV 12 P 2000 | 120,000 | |
| RL 12 P10S | 8,000 | |
| RV 24 P700 | 59,000 | |
| RV 12 P 4000 | 45,000 | |
| LG 6 | 25,000 | |
| LG 200 | 20,000 | |
| LS 4 | 34,000 | |
| Various types | 4,000 | (Still in development, not ready for manufacture). |

| | |
|------------------------------------------------|------------------------------------|
| DAC 25) | |
| LC 25) | |
| BCH 25) | 300,000 for Truppenbetriebsgeräte. |
| DP 25) | |
| DL 25) | |
| DDD 25) | |
| Knopfrohren | 144,000 |
| Gastrioden | 70,000 |
| Elektronenstrahl- rohren | 13,000 |
| Normale Rundfunk- rohren (various types) | 700,000 |
| 1875 (rectifier) | 8,000 |
| 1876 " | |

| | |
|---------------------------|------------------------------------------|
| 1904 (resistance) | 15,000 |
| 7475 (voltage stabiliser) | 48,000 |
| 150 AZ " " | 24,000 |
| 13202 X " " | 9,000 |
| 150 C1 " " | 13,000 |
| 4687 " " | 6,000 |
| EA 50 " " | 15,000 (Philips type - LG 14 telefunken) |
| EA 50 (amp. pentode UKW) | 6,000 |
| EFF 50 " " " | 4,000 |
| EFF 51 " " " | 4,000 |
| EL 51 | 1,000 |
| DAH 50 | 1,000 |

Total approximately 2,100,00 valves of which 680,000 are of special military types.

List of addresses for delivery of the above valves.

This list includes many of the well-known German radio manufacturers.

Schedule of output for May-Oct. 1943 and programme from Nov. 1943 to Oct. 1944. Probably for Eindhoven works only, probably in '000 guilders. The following is an extract.

| | <u>May-Oct.</u> <u>'43</u> | <u>Nov,</u> <u>'43</u> | <u>Dec.</u> <u>'43</u> | <u>Jan.</u> <u>'44</u> | <u>Oct.</u> <u>'44</u> |
|--------------------|-------------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| Receiver valves | 3934 | 845 | 920 | 977 | 1475 |
| Transmitter valves | 1373 | 218 | 238 | 248 | 277 |
| Other valves | 393 | 64 | 60 | 97 | 89 |

Of the above the following are for the Wehrmacht:-

| | | | | | |
|--------------------|------|-----|-----|-----|------|
| Receiver valves | 2041 | 541 | 626 | 708 | 1320 |
| Transmitter valves | 1150 | 200 | 220 | 230 | 260 |
| Other valves | 82 | 46 | 42 | 79 | 72 |

/Programme

Programme for Nov. 1943 to Oct. 1944 in '000 guilders probably for all Philips factories in Holland.

The following is an extract :-

| | <u>Nov. '43</u> | <u>Dec. '43</u> | <u>Jan. '44</u> | <u>Feb. '44</u> | <u>Oct '44</u> |
|-------------------------------------------|-----------------|-----------------|-----------------|-----------------|----------------|
| Lamps | 1113 | 1114 | 1080 | 1048 | 996 |
| Receiver Valves | 928 | 1002 | 1049 | 1103 | 1550 |
| Transmitter valves | 302 | 318 | 376 | 392 | 390 |
| Receiving or transmitting receiving sets. | 1802 | 2180 | 2130 | 2536 | 3244 |
| Transmitters | 960 | 940 | 1105 | 975 | 975 |

Figures relating to Philips valve production at Eindhoven and the effects of raids of 6.12.42 and 30.3.43.

| | | | |
|------------------------------------------------------------------------------|---------------------|---|---|
| Max. production was in Nov. 1941 | 1,100,000 per month | | |
| Production immediately prior to 6.12.42. | 710,000 | " | " |
| Production resumed in Feb-Mar. at After 30.3.43 no production until June. | 350,000 | " | " |
| Production July 1943 | 230,000 | " | " |
| " Nov. 1943 | 290,000 | " | " |
| Total production of three shadow factories at Venlo, Lent & Oss in Nov. '43. | 60,000 | " | " |

Rejects in valve manufacture amounted to 3 $\frac{1}{2}$ % in 1940 and to 10% in Nov. 1943.

Philips pre-war output of valves in Holland was 7,000,000 - 9,000,000 per annum.

The firms of Horny and Schrock in Vienna are both subsidiaries of Philips, the latter making sets and the former components.

It will be seen from the figures of valve output for Nov. 1943, that the total output of valves for this month was 350,000 and that their value was 1,230,000 guilders giving an average value per valve of 3.58 guilders. Applying this value to the programme figure for Oct. 1944, it appears that the planned output of valves for this month is about 540,000.