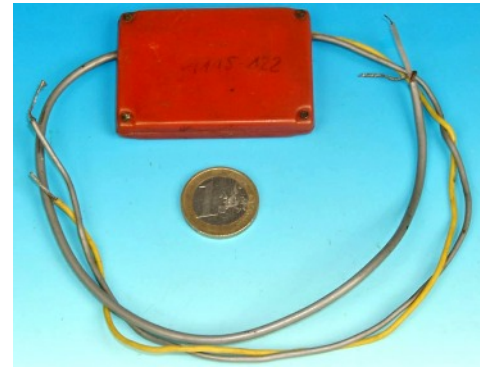


TF-B tx (2D) covert number 31131-111/112/113 with external microphone.



TF-B tx (2D) covert number 31115-122, earlier model with external microphone known as 'Leipzig alt flach (old flat) 24V'.

## TF-B tx (2D) Two wire line

31131

(GDR line bugs X)

Country of origin: GDR

(To be read in conjunction with Chapter 163.)

### DATA SUMMARY

**Organisation:** MfS, Abt. 26, GDR.  
**Design/manufacture:** MfS, OTS Abt. 33.  
**Year of Introduction:** 1980s.  
**Purpose:** Covert room overhearing using any existing galvanic connection for routing the output of a TF-B tx (2D) bug at an Operational Object to an Operational Support Point.  
**FM carrier frequencies:** Ch.1 24kHz, Ch.2 40kHz, Ch.3 104kHz;  $\pm 1/2$ kHz.  
**Modulation frequency deviation F3:** Max.  $\pm 2.8$ kHz.  
**Max. AF input:** -60dB.  
**Frequency response:** 0.1-3.4kHz.  
**Output level:** -12 dB @ 200 $\Omega$ .  
**Associated receiver:** 31140-101/102/103.  
**Power supply:** 7.5V DC @ 0.5mA from 31140 TF-B rx in Operational Support Point via the line, or a separate power supply at the Operational Object.  
**Size (mm):** Height 10, length 58, width 23; weight 42g.  
**Microphone:** e.g. Knowles type BT 1751.

### REMARKS

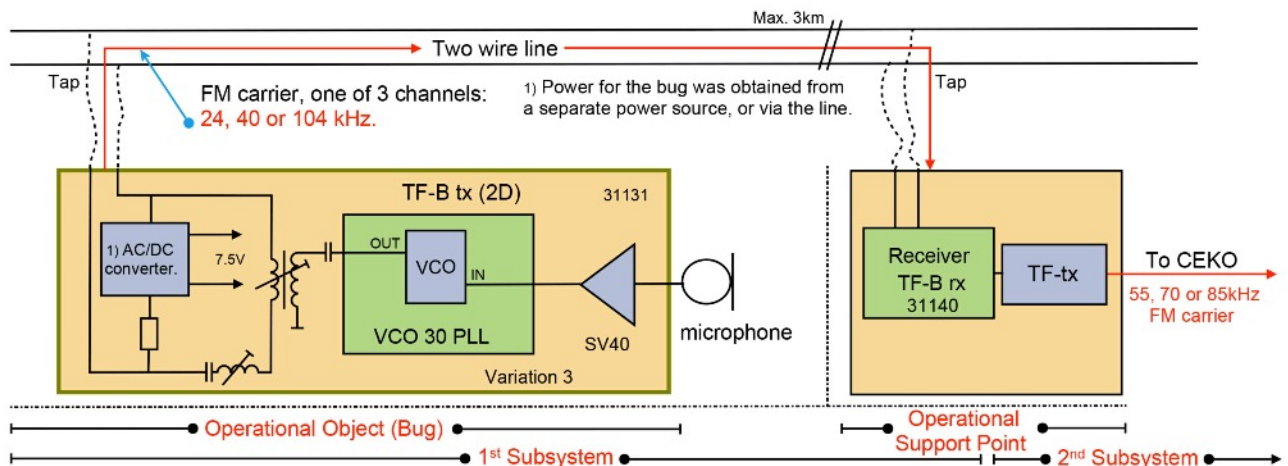
A galvanic connection, which could be a two wire line, a copper water pipe and central heating pipe, mains null or an aerial cable was used as a medium to route the output of a TF-B tx (2D) bug via the Operational Support Point to the CEKO system. See the photos at the top of page 1, Chapter 163.

The TF-B tx (2D) bug comprised a PLL chip which generated a carrier, FM modulated by the microphone, superposed on the two-wire line. This FM carrier was 24, 40 or 104kHz.

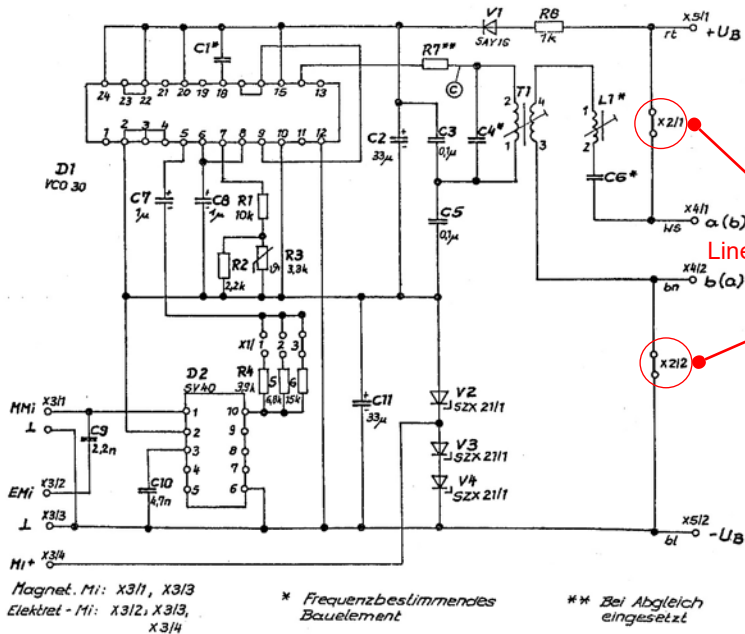
Power for the bug was obtained from a separate nearby AC mains power unit 31131 or battery, or via the line from the the TF-B rx 31140 at the Operational Support Point.

*There were, as far as could be traced, five different variations in the design of the TF-B tx (2) bugs, functionally similar but built with different components, used for specific purposes.*

*Variation 1 [ in TF-B tx (2A) and TF-B tx (2C) ] used a HEF 4046 PLL; Variation 2 [ in TF-B tx (2B) ] used a CD 4046A PLL; Variation 3 [ in TF-B tx (2D) ] used a VCO 30 PLL. Variation 4 [ in TF-B tx (2A) ] OSA version with unknown components. Variation 5 [ in TF-B tx (2B) ] 33014 with an USK-14 hybrid circuit. Apart from a different type PLL, there were numerous changes in the circuits, required for each application, e.g. input circuit, power requirement, FM carrier frequency and remote on-off switching.*

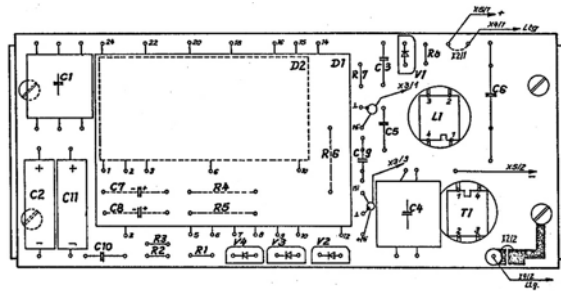
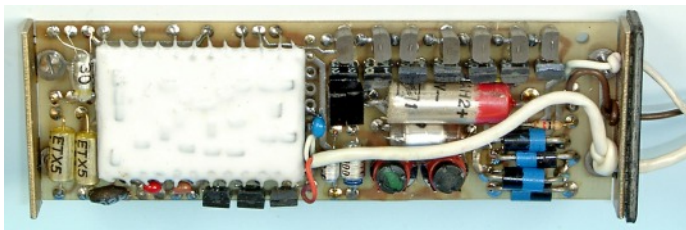


Functional block diagram of the TF-B (2D) system.



Used with any 2-wire line the TF-B tx (2D) links X2/1 and X2/2 were closed for power via the line. The links were opened and nearby power was applied to X5/1 and X5/2 when used with any other galvanic connection.

Circuit diagram of TF-B tx (2D) bug. Either a electro magnetic or a electret microphone could be connected.



Top view of TF-B tx (2D) board. The microphone amplifier chip D2 (SV40) was hidden under the PLL chip D1 (VCO30).

**Currently known covert numbers of TF-B tx (2D).**

- 31115-111/111/113\* TF-B tx (2D) Earlier model Leipzig with microphone.
- 31115-121/121/123\* TF-B tx (2D) Earlier model Leipzig with external micr.
- 31131-101/102/103\* TF-B tx (2D) Transmitter with built-in microphone.
- 31131-111/112/113\* TF-B tx (2D) Transmitter without microphone.
- 31140\* TF-B rx Receiver.

\*) 3 different channels.

**References:**

- With thanks to Detlev Vreisleben, DC7KG, Germany for taking excellent photographs and scans, and providing further technical and historical information.
- MfS document: Kennblatt Gerät 31131, 18-09-1978.