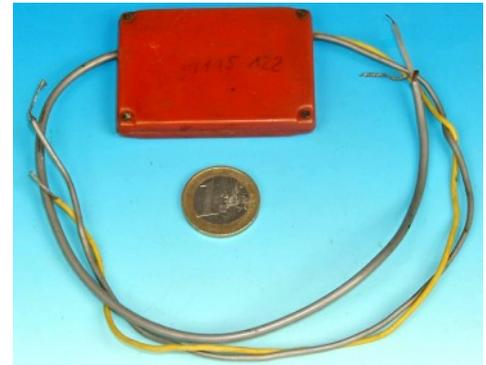




TF-B tx (2D) covert number 31131-111/112/113 with external microphone.



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/manufacturer: 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. ± 2.8 kHz.

Max. AF input: -60dB.

Frequency response: 0.1-3.4kHz.

Output level: -12 dB @ 200 Ω .

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;

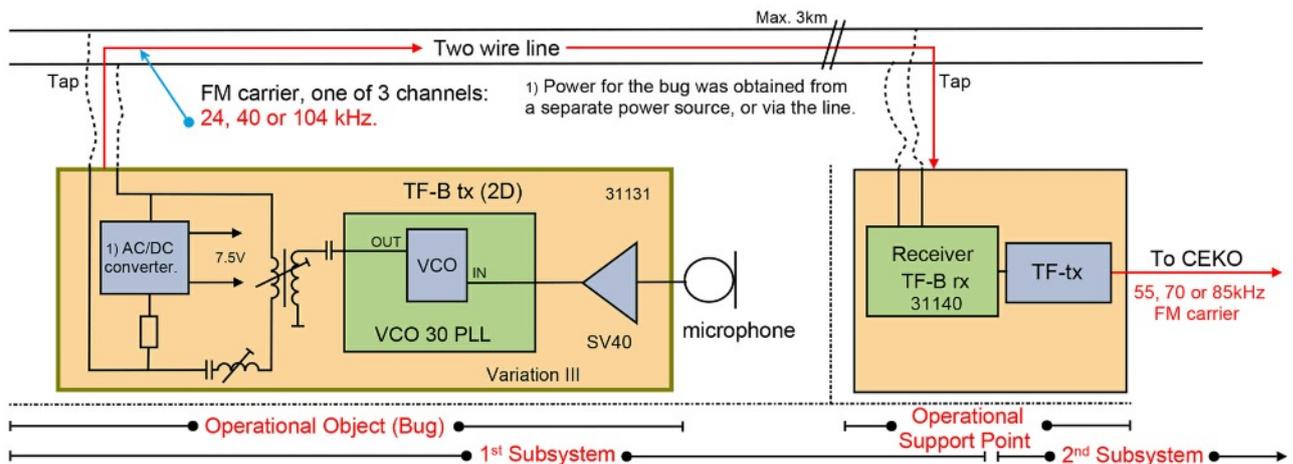
Variation 2 [in TF-B tx (2B)] used a CD 4046A PLL;

Variation 3 [in TF-B tx (2D)] used a VCO 30 PLL.

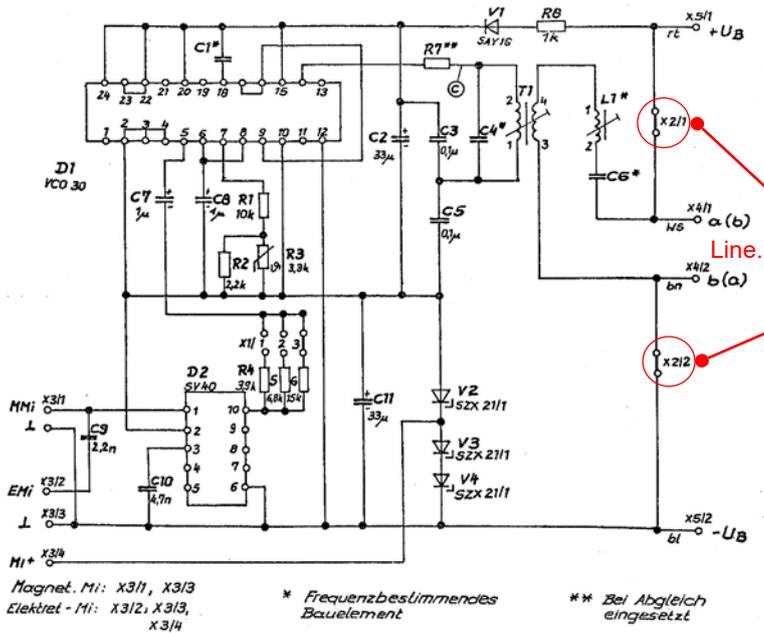
Variation 4 [in TF-B tx (2A)] OSA version with unknown components.

Variation 5 [in TF-B tx (2B)] 33014 with unknown thick film chip.

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.

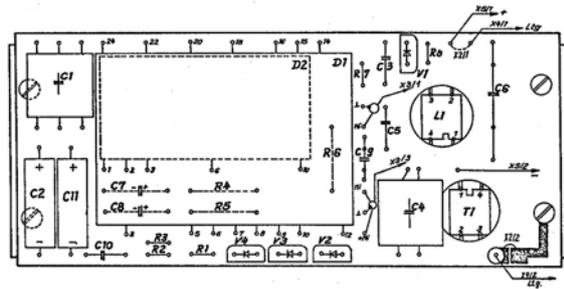
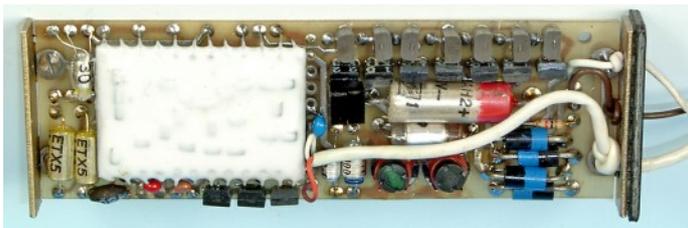


Functional block diagram of the TF-B (2D) system.



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 only.
- 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.