

# TF-B tx (2B) Telephone 1

33010

(GDR line bugs VI)

Country of origin: GDR

TF-B tx (2B) transmitter 33010 Variation B board glued under a pertinax terminal board prior being concealed inside a 5-pt terminal box. (See Chapter 169).

(To be read in conjunction with Chapters 163 and 169.)

## DATA SUMMARY

- Organisation:** MfS, Abt. 26, GDR.
- Design/manufacture:** MfS, OTS, Abt. 33.
- Year of Introduction:** Early 1980s.
- Purpose:** Sub-miniature line based bug for use over a standard telephone line. Part of assemblies 33011 and 33012.
- FM carrier frequency:** 24kHz, 40kHz or 104kHz;  $\pm 1/2$ kHz.
- Modulation frequency deviation:**  $\pm 2.4$ kHz.
- Frequency response:** 0.3-3.4kHz.
- Output level:** -12dB  $\pm 1/2$ dB @ 150 $\Omega$ .
- Microphone:** Knowles type BT 1751 or BT 1759.
- Power Supply:** 40..65V, derived from 48V telephone line voltage.
- Consumption:** 150-350 $\mu$ A, depending on frequency.
- Associated receiver:** LWE 6-2 or LWE 7.
- Size (mm):** Height 4.1, Length 30, width 17.
- Semiconductors:** CD 4046 Ak (RCA), BCE 107 2x, BCE 177 2x, BAS20 (Valvo) 4x, BZX 79 (Valvo).

## REMARKS

A telephone subscriber line at the intercepted location (Operational Object) to an Operational Support Point, or as an alternative direct to the CEKO system via a lease line, was used as transmission medium. The actual bug was often concealed in the telephone subscriber's terminal block. The TF-B tx (2B) bug, covert number 33010, comprised a PLL chip which generated a carrier, FM modulated by the microphone, superposed on the telephone line. As the carrier frequency was well above audible, it could not be heard in the telephone. It should be noted that the telephone subscriber line might be located at a next door apartment and only used for routing to the CEKO, either directly or via an Operational Support Point.

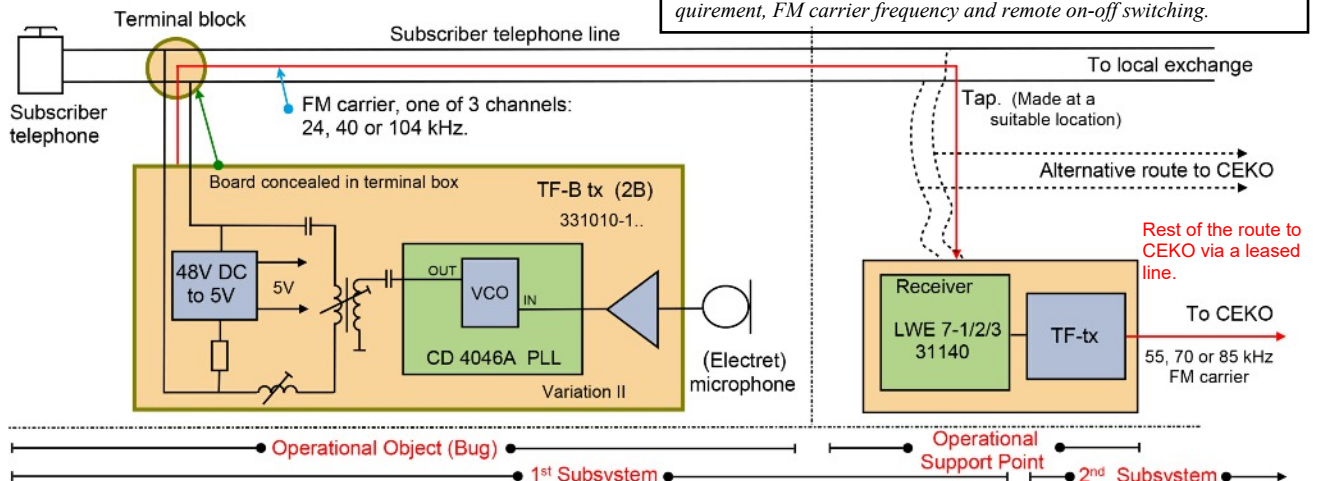
The 33010 was a miniature single board, produced in two variations and three versions (channels). The 33010 was based on a CD 4046A 16-p TSSOP chip which was a PLL comprising a separate VCO and a phase comparator. The latter was not used in this design. It could be used for fitting into a covert object, but was mainly for use in telephone terminal blocks (assembly covert number: 33011), and in 6/12/24/48-pt telephone subscriber terminal blocks (assembly covert number: 33012). See Chapter 169 for more details. The associated receiver, located in the Operational Support Point was the LWE 7 (Chapter 176), TF-B rx 31140 or control receiver LWE 6-2 (Chapter 175).

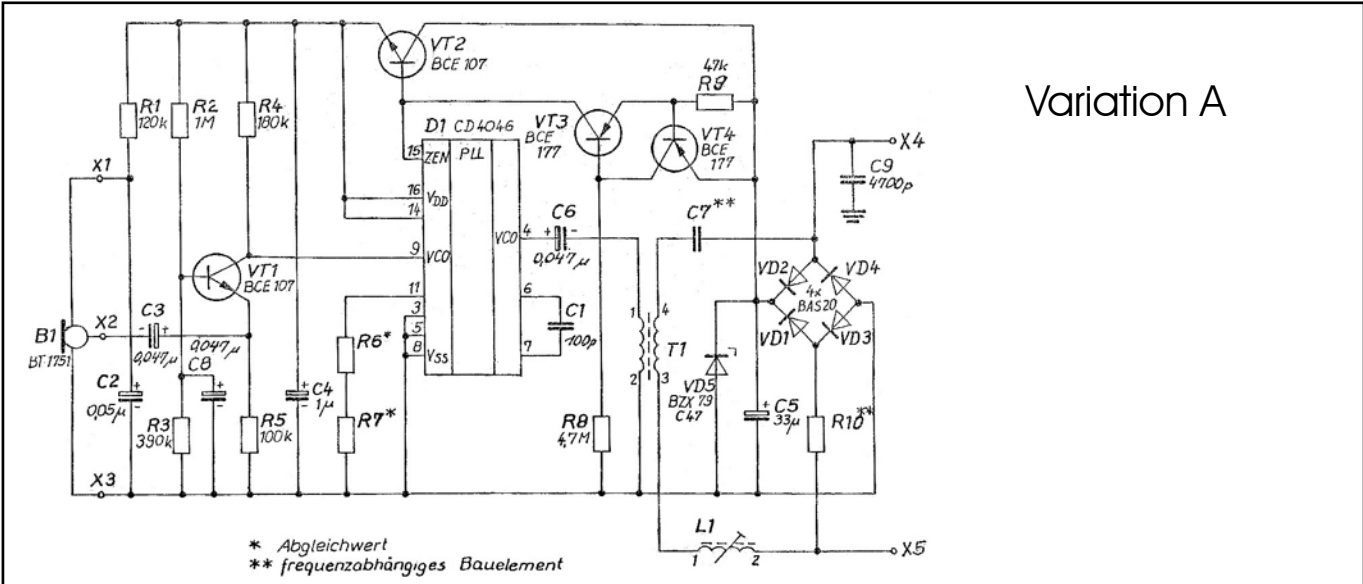
*There were, as far as could be traced, five different variations in the design of the TF-B tx (2) bugs, functionally similar but built with different components, used for specific purposes.*

- Variation 1 [ in TF-B tx (2A) and TF-B tx (2C) ] used a HEF 4046 PLL;*
  - Variation 2 [ in TF-B tx (2B) ] had a CD 4046A PLL;*
  - Variation 3 [ in TF-B tx (2D) ] had 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.*

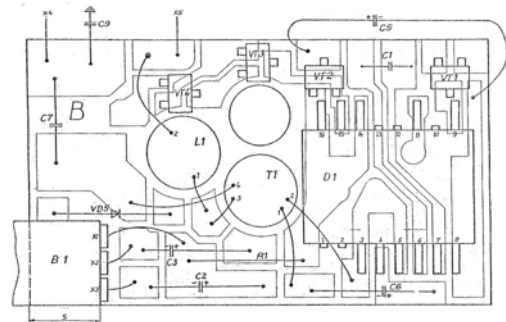
The circuit and construction of the TF-B tx (2B) transmitter differed considerably from the TF-B tx (2A) and TF-B tx (2C). The principle however was similar; the TF-B tx (2A) used subminiature components, of some were acquired outside the GDR.

### Block diagram of TF-B (2B) Subscriber telephone system.

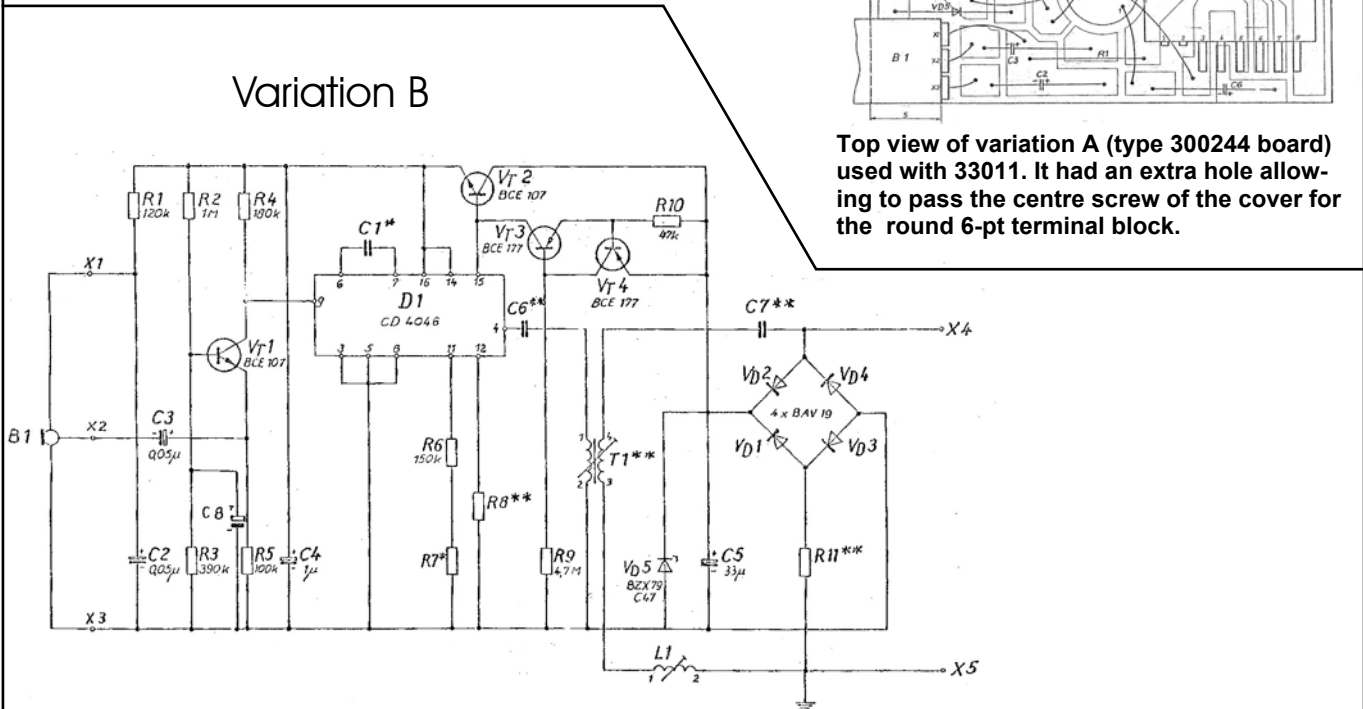




Circuit diagram of 33010 (variation A) as used in 33011. It was usually concealed in a hollow space of a standard round 6-pt subscriber's telephone terminal block. (See chapter 169)

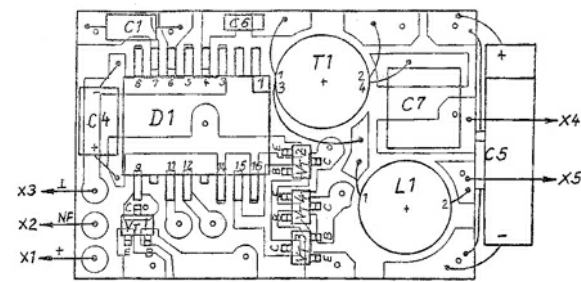


Top view of variation A (type 300244 board) used with 33011. It had an extra hole allowing to pass the centre screw of the cover for the round 6-pt terminal block.



Circuit diagram of 33010 (variation B) primarily intended for 33012. It was usually concealed in a hollow space of a standard rectangular subscriber's telephone terminal block. (See chapter 169)

Both variants differed only in detail.



Top view of variation B board for 33012, intended for fitting in a terminal block.

**References:**

- With thanks to Detlev Vreisleben, DC7KG, Germany for taking excellent photographs and scans, and providing all technical and historical information.
- MfS document: Prüfvorschrift für das Gerät 33010-1, 02-08-1979.