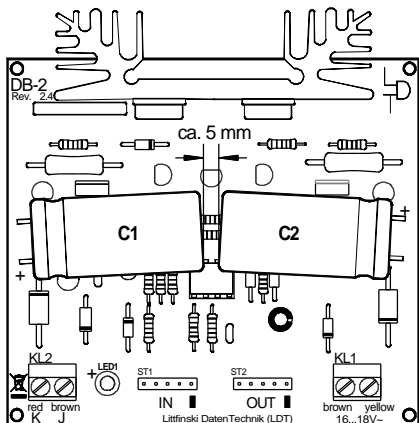
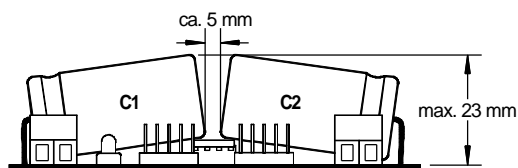


Assembly of the electrolytic capacitors C1 and C2:

The **connection wires** of capacitor **C1** and **C2** have to be **bent by 90°** before assembly. The capacitors have to be soldered so that they are laying flat above the components of the pc-board. The capacitors have to have a distance of 5mm. A contact between the capacitors has to be prevented.

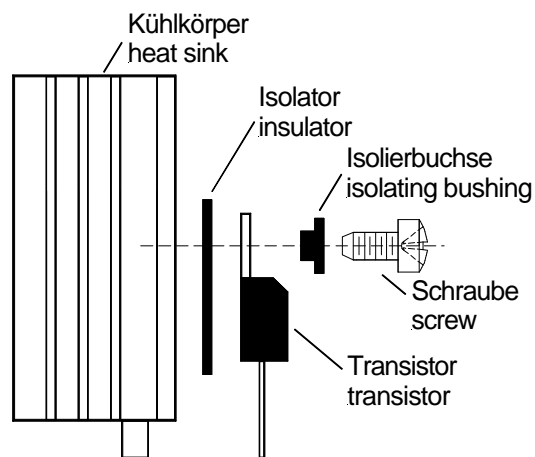


Draft 1

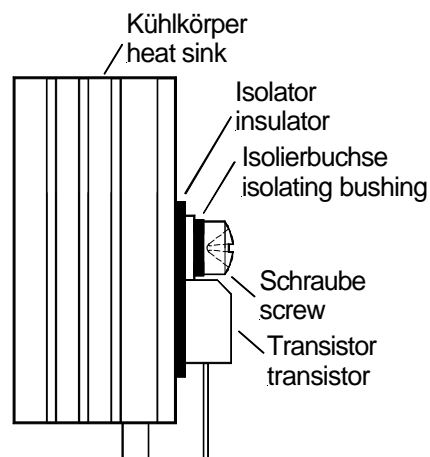


Assembly of the power transistors T1 and T2:

The **power transistors T1** and **T2** shall be assembled to the **heat sink** in accordance to the drawing by using **the insulator, isolating bushing and screw**. Then insert the complete pre-assembly into the bores of the pc-board and solder them.



Draft 2



Draft 3

Littfinski DatenTechnik (LDT)

Assembly Instruction



DigitalBooster DB-2

from the *Digital-Professional-Series* !

DB-2-B Part-No.: 080061

>> kit <<

The DigitalBooster DB-2 is a short-circuit-proofed power amplifier (booster) for digital model railway layouts.

Maximal power output: 2.5A.

The DB-2 amplifies the data formats Märklin-Motorola, mfx®, M4 and DCC

The DB-2 can be directly operated on several digital command stations by use of the attached 5-poles booster-bus cable:

- ⇒ Control Unit (6021)
- ⇒ Central Station 1 and 2 (CS1 and CS2)
- ⇒ Intellibox, EasyControl, ECoS, DiCoStation, KeyCommander
- ⇒ TWIN-CENTER

This product is not a toy! Not suitable for children under 14 years of age! The kit contains small parts, which should be kept away from children under 3! Improper use will imply danger of injuring due to sharp edges and tips! Please store this instruction carefully.



CE Part-No.:
49 91 39

Made in Europe by
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Phone: 0049 4122 / 977 381
Fax: 0049 4122 / 977 382

Internet: <http://www.ltd-infocenter.com>

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Introduction:

You have purchased a kit for your model railway supplied within the assortment of Littfinski DatenTechnik (LDT). These kits are of high quality and easy to assemble.

We are wishing you having a good time for assembling and application of this product!

General:

Tools required for the assembly

Please assure that the following tools are available:

- a small side cutter
- a mini soldering iron with a small tip
- solder tin (if possible 0,5mm diameter)

Safety Instructions

- All electrical and electronic components included in this kit shall be used on low voltage only by using a tested and approved voltage transducer (transformer). All components are sensitive to heat. During soldering the heat shall be applied for a very short period only.
- The soldering iron develops a heat up to 400°C. Please keep continual attention to this tool. Keep sufficient distance to combustible material. Use a heat resistant pad for this work.
- This kit consist of small parts which can possibly be swallowed from children. Children (especially under 3 years) shall not participate on the assembly without supervision.

Set-Up:

For the board assembly please follow exact the sequence of the below **assembly list**. Cross each line off as **done** after completing the insertion and the soldering of the respective part.

For the **diodes** please keep special attention the correct polarity (marked line for the cathode).

With reason to different makes of **electrolytic capacitors** you will find different markings of the polarity. Some are marked with "+" and some are marked with "-". Each capacitor has to be assembled to the board that the marking on the capacitor is in correspondence with the marking on the pc-board. The connection wires of capacitor **C1** and **C2** have to be bent by 90° before assembly. The capacitors have to be soldered so that they are laying flat above the components of the pc-board (shown at draft 1). The capacitors have to have a distance of 5mm. A contact between the capacitors has to be prevented.

For **tantalum capacitors** please attend to the connection wire marked "+". This wire has to correspond to the printed mark on the pc-board.

Light emitting diodes have to be assembled that the long wire of the diode corresponds to the mark "+" on the pc-board. Before assembly please slip the **distance spacer** onto the connection wires.

At the **transistor BC 5XX** and the **voltage regulator IC1** the flattened side has to be observed.

The **transistors T3 and T4** have to be assembled that way that the printed lettering shows to the middle of the pc-board.

The **power transistors T1 and T2** shall be assembled to the **heat sink** in accordance to the drawing by using **the insulator, isolating bushing and screw**. Then insert the complete pre-assembly into the bores of the pc-board and solder them (as shown in draft 2 and 3).

Integrated circuits LM393 are either marked with a half round notch on one end or a printed point for the correct mounting position. Push the IC's into the correct socket assuring that the notch or the printed point is corresponding to the half-rounded marking on the pc-board.

Assembly List:

Pos.	Qty.	Component	Remarks	Ref.	Done
1	1	Printed circuit board			
2	2	Resistors 0,18 Ohm	marking:"R18"	R1, R2	
3	2	Resistors 2,2 Ohm	red-red-black-silver	R3, R4	
4	2	Resistors 47 Ohm	yellow-violet-black-gold	R5, R6	
5	2	Resistors 1KOhm	brown-black-black-brown	R7, R8	
6	1	Resistor 2,7KOhm	red-violet-black-brown	R9	
7	1	Resistor 3,3KOhm	orange-orange-black-brown	R10	
8	2	Resistors 47KOhm	yellow-violet-black-red	R11, R12	
9	1	Resistor 5,6KOhm	green-blue-black-brown	R13	
10	4	Resistors 10KOhm	brown-black-black-red	R14...R17	
11	1	Resistor 22KOhm	red-red-black-red	R18	
12	1	Resistor 68KOhm	blue-gray-black-red	R19	
13	2	Diodes BY251	attend to the polarity!	D1, D2	
14	1	Diodes 1N4003	attend to the polarity!	D3	
15	10	Diodes 1N4148	attend to the polarity!	D4...D13	
16	1	IC-Socket 8poles		IC2	
17	2	Capacitors 100nF	100nF = 104	C5, C6	
18	1	Tantalum cap. 1uF/35V	attend to the polarity!	C4	
19	1	Electrolytic cap. 47uF/50V	attend to the polarity!	C3	
20	1	LED plus distance spacer	attend to the polarity!	LED1	
21	1	78L06	attend to the polarity!	IC1	
22	2	Transistors BC 547	attend to the polarity!	T5, T6	
23	3	Transistors BC 557	attend to the polarity!	T7...T9	
24	1	Transistor BD139	attend to the polarity!	T3	
25	1	Transistor BD140	attend to the polarity!	T4	
26	2	Cross recess screws M3x6	for assembly of T1 and T2		
27	2	Silicone insulators	for assembly of T1 and T2		
28	2	Isolating bushings	for assembly of T1 and T2		
29	1	Heat sink	for assembly of T1 and T2		
30	1	Transistor BD243	assembly on heat sink	T1	
31	1	Transistor BD244	assembly on heat sink	T2	
32	2	Pin plugs 5poles		ST1, ST2	
33	2	Clamps 2poles		KL1, KL2	
34	1	IC: LM393	attend to the polarity!	IC2	
35	2	Electrolytic cap.4700uF/35V	attend to the polarity!	C1, C2	
36	1	Multi-Fuse		MF1	
37			Final control		

To enable the **DigitalBooster DB-2** to supply the maximal possible digital current it has to get a **minimum of 52VA** from a **model railway transformer** at **clamp KL1**. **The transformer output voltage** can be between **16 and 18 Volt AC**.

If the transformer supplies already other consumers on the layout you have to take special attention to the **correct terminal occupation at the supply clamp KL1**. You have to attend to the correct colors "**yellow**" and "**brown**" by connecting to a command station of Märklin **Control Unit** or **Intellibox**.

3. Booster connected to a rail:

The digital current of the **DigitalBoosters DB-2** is available at **clamp KL2** next to the light emitting diode.

Each booster must supply an own current circuit on the layout.

Therefore the center conductor of a 3-conductor rail has to be **isolated** at the **joint** to the next current-circuit.

The output "**brown**" of the **clamp KL2** supplies **both rails**. The output "**red**" supplies the **center conductor of the isolated section**.

On the **2-conductor rail** shall as **minimum one rail be isolated at the joints**. The rail inside the **isolated section** gets the supply from the output "**red**" of the **booster clamp KL2**. The **second rail** (not necessarily isolated) receives the supply from output "**brown**".

Booster in action:

After switching-on the model railway layout and actuating the **push button "GO"** at the command station the **red light emitting diode (LED)** of the **DigitalBooster DB-2** will **glow**. This indicates that the booster supplies digital current to the connected rail-section.

The booster will switch automatically off by any **short circuit** at the rail section. **The red light emitting diode will go out**. The event of a short circuit will be reported from the booster to the command station via the 5-poles booster bus. These will switch to "Stop".

After **eliminating the short circuit** you can supply digital current to the rail by actuating again the **push button "Go"** at the command station.

Will the current at the connected rail section **extend 2.5 Ampere** the booster will **switch off as well**, to **prevent overheating**.

Booster assembly:

Please assemble the **Booster DB-2** at a location that **sufficient air** can **circulate at the heat sink**.

If you have purchased the **Booster DB-2** as a **kit** you can assemble the completed unit into a **suitable empty case LDT-01**. This case is available as **accessory** within our program.

Littfinski DatenTechnik (LDT)

Operating Instruction



DigitalBooster DB-2 from the *Digital-Professional-Series* !

DB-2-G Part-No.: 080063

>> finished module in a case <<

The DigitalBooster DB-2 is a short-circuit-protected power amplifier (booster) for digital model railway layouts.
Maximal power output: 2.5A.

The DB-2 amplifies the data formats Märklin-Motorola, mfx®, M4 and DCC

The DB-2 can be directly operated on several digital command stations by use of the attached 5-poles booster-bus cable:

- ⇒ Control Unit (6021)
- ⇒ Central Station 1 and 2 (CS1 and CS2)
- ⇒ Intellibox, EasyControl, ECoS, DiCoStation, KeyCommander
- ⇒ TWIN-CENTER

This product is not a toy! Not suitable for children under 14 years of age! The kit contains small parts, which should be kept away from children under 3! Improper use will imply danger of injuring due to sharp edges and tips! Please store this instruction carefully.



CE Part-No.:
49 91 41

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Introduction / Safety instruction:

You have purchased the **DigitalBooster DB-2** for your model railway. The **DB-2** is a high quality product that is supplied within the assortment of Littfinski **DatenTechnik (LDT)**.

We are wishing you having a good time using this product!

The finished module in a case comes with a **24 month warranty**.

- Please read the following instructions carefully. Warranty will expire due to damages caused by disregarding the operating instructions. **LDT** will not be liable for any consequential damages caused by improper use or installation.

Connecting the booster to the digital system:

- **Attention:** Before starting the installation switch off the drive voltage by pushing the stop button or disconnect the main supply.

1. Booster connected to the command station respectively to other boosters:

The **DigitalBooster DB-2** is a power-amplifier for your digital model railway layout. It supplies digital current to an **own rail section**.

The **DB-2** shall be connected to the digital command station (e.g. Central Station Control Unit, Intellibox, TWIN-CENTER, DiCoStation) or to another booster (e.g. DB-2, DB-4, 6015, 6017, Power 2, Power 3) with the supplied **5-poles booster-bus-cable**. The first booster shall be always directly connected to the command station via the 5-poles cable. The second booster shall be connected to the first booster etc.

Connect the plug of the attached 5-poles booster-bus-cable to the command station or the previous booster. The correct position of the plug at **Control Unit, Intellibox, TWIN-CENTER, Märklin Booster 6017, Power 2** and **Power 3** is, that the **cable at the plug shows downwards**. The **booster-bus cable** attached to the **DB-2** has to **show upwards** by connecting to **Märklin Booster 6015**.

If you use the **DigitalBooster DB-2** on the PC-Direct Control **DIGITAL-S-INSIDE** insert the plug to the pin-plug bar of the pc-adaptor or to the DiCoStation so that the **white single wire** of the cable **corresponds** to the **white marking** on the **pin-plug bar**. The cable will go now straight away from the adapter.

The second plug of the booster-bus cable has to be connected at the **DigitalBooster DB-2** on the **pin-plug-bar ST1** marked with "IN".

Please attend to the correspondence of the **white single wire** of the 5-poles cable with the **white marking** on the **pin-plug-bar ST1**.

You have connected the plug of the attached 5-poles booster-bus cable correct to the **DigitalBooster DB-2** whenever the twisted cable goes straight away from the booster.

Other manufacturers supply a **5-poles ribbon-cable** as booster cable. If you use these connect the plug on the pin-plug bar ST1 so that the ribbon-cable shows to the booster cover and has then to be directed over the plug to the command station or to the previous booster.

Shall a following booster connected to the **DigitalBooster DB-2** by using the 5-poles booster-bus cable it has to be connected to the **pin-plug bar ST2** ("OUT").

2. Booster connected to the model railway transformer:

The **DigitalBooster DB-2** supplies a **maximal digital current of 2.5 Ampere** to the rail.

