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SwitchBlade Series SB Head

Note!

The components used in this product - particularly parts affecting safety as well as speakers and transformers - were developed and manufactured to certain specifications. Please use original spare parts only to ensure the product remains fully functional and safe.

Achtung!

Die in diesem Produkt verwendeten Komponenten, insbesondere sicherheitsrelevante Teile, Lautsprecher und Transformatoren wurden nach spezifischen Vorgaben entwickelt und gefertigt. Bitte benutzen Sie ausschließlich Original-Ersatzteile – nur so ist die volle Funktionalität und Sicherheit gewährleistet.



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1 The Fundamentals of Handling

SWITCHBLADE is a tube amp and, as such, works like a tube amp. Nevertheless, the handling concept is rather advanced, so time spent familiarizing yourself with it is time well spent.

At first glance, the knobs look and feel like standard-issue gear: Control range 300 degrees; 0-10 clockwise; left and right stops.

At second glance, though, you'll discover that there is just a single set of knobs to serve all four Channels. One **GAIN**, one Channel **MASTER**, one three-band EQ – that's it. The selected Channel determines if the **GAIN** knob addresses the **CLEAN**, **CRUNCH** or **LEAD** Channel.

The great advantage of this concept is that Channels are independent and do not share the Gain, Master or voicing knobs; even Presence is separately adjustable for every Channel and every setting can be programmed individually to each of the 128 Presets!

Apart from the **VOLUME MASTER** knob (and of course **MAINS** and **STANDBY**), this applies to all of **SWITCHBLADE**'s control features, that is:

- the Channels: **CLEAN**, **CRUNCH**, **LEAD**, **ULTRA**
- the Channel settings: **GAIN+BOOST**, **BASS**, **MID**, **TREBLE**, **PRESENCE**, **MASTER**
- the effect parameters: **MOD FX**, **TIME**, **FEEDBACK**, **VOLUME**, **REVERB**
- the effect routing options for external devices: **FX ON/OFF**, **SERIAL/PARALLEL**



You won't find any control features for managing the 128 Presets on Switchblade. The included FSM 432 MIDI board or another MIDI-enabled controller serves to select Presets and assign memory slots. More on this in chapter 6.

Note: A knob setting programmed in a Preset and the knob's actual setting are not necessarily the same. They are independent: When you switch from one Preset to another, the knob's actual position may not

reflect the setting programmed in the Preset. This means you may well hear something other than what you're seeing would suggest. As soon as you touch the knob, it will respond like any other conventional knob. The **ORIGINAL VALUE LED** in the **MASTER** section tells you the Preset setting. It lights up as soon as the position of the knob corresponds to the Preset setting. More on this in chapter 4.3.

Note: You may hear a soft background sound when you twist the knobs. This is a switching noise made the programmable resistor matrix located behind each knob.

2 The SWITCHBLADE's Channels

SWITCHBLADE offers four Channels with markedly different sonic characters. Courtesy of **SWITCHBLADE**'s programmability, you enjoy more and more powerful sound-shaping options: The knobs are not hardwired to the internal circuits, so we were able to tweak their control ranges and performance to make the most of each Channel's characteristic sound.



A chickenhead knob is sited at the far right of the **CHANNEL** section—that's the Channel Selector. Use it to switch among the four Channels along with their **GAIN**, **BASS**, **MID**, **TREBLE**, **PRESENCE** and **MASTER** settings.

Note: When you first power up your amp and change Channels, you will dial up factory settings (see chapter 6.3.2 to learn more). As soon as you begin dialing in sounds to your taste, it will adopt your Channels settings. And it recalls your most recently configured sound for each Channel. You'll find this to be a tremendous help when programming. More on this in chapter 6.

2.1 Clean Channel

Tuned to rival classic Californian tone, Switchblade's Clean Channel delivers a spectrum of sweet sounds ranging from crystal-clear to remarkably responsive Crunch tones. The programmable Presence control adds silken warmth as well as sparkling shimmer to the sonic equation.

2.2 CRUNCH Channel

Classic British overdrive à la carte! The **CRUNCH** Channel covers the diverse tonal spectrum from Clean to mean, and all points in between. The Gain control's integrated Boost function transforms tight rhythm tone into a throaty growl perfect for rockin' riffs.

2.3 LEAD Channel

The **LEAD** sound is the first choice for hard-rockin', classic British high-**GAIN** tone to fuel Leads, power chords and riffs. Courtesy of its fine-tuned compression, this Channel delivers the lubricant that makes those slick riffs and licks fly off your fingertips.

2.4 ULTRA Channel

American high-Gain sound with sumo-sized low end and snarling top end. The **ULTRA** Channel delivers the kind of merciless performance that is sure to delight nu metal meisters and dropped tuning aficionados. Ultra is also an alluring alternative for guitarists seeking to super-size their sound with a high-calorie topping of rich tone.

2.5 GAIN

The **GAIN** knob determines Input sensitivity and thus the Level of saturation and distortion. **SWITCHBLADE**'s **GAIN** offers a special feature: Just before the knob arrives at the far right position, a **BOOST** stage kicks in (and the red LED lights up). Now, when you see Boost on other amps, this usually means all frequencies are boosted. But Switchblade's Boost amplifies selected frequency ranges for each Channel to attain creamier tone.

2.6 BASS, MID, TREBLE

The voicing section is tweaked to accomplish the best, most efficient sound-shaping for each Channel. Getting right to the heart of the sonic matter, every knob addresses each Channel's characteristic frequency ranges. Like on every tube amp, the knobs of a Channel influence each other. That is, if you boost the Treble, the midrange is cut and vice versa. This puts a much greater range of subtle tonal variations at your fingertips.

2.7 PRESENCE

This knob determines the overtone content. Unlike a **TREBLE** knob, which boosts whatever high frequencies are available, **PRESENCE** actually determines the amount of harmonic overtones generated by the amp. Usually a **PRESENCE** knob controls the overtone content of the overall amp rather than of individual Channels. Courtesy of **SWITCHBLADE**'s programmability, you can define **PRESENCE** settings not only for each Channel, but also for each Preset.

2.8 MASTER

Use the Channel **MASTER** knob to adjust the given Channel's Volume and balance it out with the other Channels' Levels. On Switchblade this knob serves another vital purpose: It lets you store the same sound at different Volumes to any of the 128 Presets, for example, a softer version for rhythm and a louder setting for Leads.

Note: The Channel MASTER is a different breed of knob. It adjusts the Channels' relative levels, and is tweaked to help you quickly dial in the best balance. Unlike a conventional Master knob, it can't be turned

all they way Down; it merely boosts or cuts the given Level. This design makes musical and practical sense: The Clean Channel normally requires a much higher Master Level than a distorted Channel, which is why it is about as loud as the other Channels when the knob is set to the center position. That's why the 12 o'clock position is always the best starting point for adjusting Volume.

3 Digital Effects

SWITCHBLADE offers three independent digital effect sections that can be used simultaneously. Like Channel settings, all effect settings are programmable.



Note: The internal effects are added to the signal via an intelligent analog circuit. Effect routings in no way compromise the integrity of SWITCHBLADE's tube tone, which remains intact in all its quality.

3.1 REVERB

SWITCHBLADE's Reverb is modeled to match the warmth and musicality of classic spring Reverbs. A genuine improvement over its analog forebears, it automatically adjusts the Reverb tail to suit the setting: The more **REVERB** you add to the signal, the longer the **REVERB** time.

3.2 DELAY

The Delay section's **VOLUME**, **TIME** and **FEEDBACK** knobs afford you total control over all parameters. This lets you dial in everything from rockabilly style slap-back echo to U2-inspired Delay extravaganzas and Queen-like bombast.

3.2.1 VOLUME

Adjusts the Volume of the repetitions, sweeping from all the way off to just as loud as the original signal.

3.2.2 FEEDBACK

Adjusts the number of repetitions from one to infinite.

3.2.3 TIME

Adjusts the Time to the next repetition from 80 ms to 1.4 s.

TIP: TIME can be remote-controlled via the included FSM 432 using the TAP function. This lets you respond quickly and conveniently to timing changes. You'll find TAP to be a very helpful feature, particularly on stage! More on this in chapter 6.1.3

3.3 MOD FX

The three most important modulation effects are **CHORUS**, **FLANGER** and **TREMOLO**, and they're all on board, readily activated via a single knob. **CHORUS** is active in the first third, **FLANGER** in the second third, and **TREMOLO** in the final third of the control range. You can shape the effect within its assigned third of the control range using this knob. The parameters were tweaked to make musical sense: A twist of the knob is all it takes to get the desired effect. Twisting clockwise adjusts the rate of the modulation effects. Modulation depth is adjusted

automatically according to the rate so that every knob position gives you the best effect sound. To switch modulation effects off, simply twist the knob to the far left-hand position.

3.3.1 CHORUS

At slow settings, the **CHORUS** sounds thick and lush, providing a great sound for buoyant ballads. And because effect depth is adjusted automatically, fast **CHORUS** settings don't evoke that dreaded seasick tone.

3.3.2 FLANGER

Slow **FLANGER** settings yield a stately sweeping whoosh effect, while faster settings give you swirly effects often heard in contemporary rock and pop tunes.

3.3.3 TREMOLO

The classic **TREMOLO** effect is great for dialing in typical sounds of the '60s as well as contemporary effect sounds.

4 Master

The Master section lets you adjust the amp's overall Volume, route external effects, and store Presets.

4.1 VOLUME



As the name would indicate, this knob puts the power amp at your thumb and forefinger's command. Exercise restraint when handling this knob to make music a pleasant rather than a painful experience.

Handling: Unlike the Channel and effect knobs, the **MASTER VOLUME** knob is not programmable! It works like any standard knob, and the position of the knob indicates the actual setting.

Caution: High volume levels can cause hearing damage. Spare yourself a nasty surprise and twist the **MASTER VOLUME** knob to the far left-hand position before powering the amp up.

4.2 STORE

Use the **STORE** button to save your Presets. See chapter 6.4 for more info.

4.3 ORIGINAL VALUE

This LED tells you which knob setting is stored in the given Preset. To this end, select a Preset, grab the knob and twist it to the left or right until this LED lights up. The setting at which the LED lights up corresponds to the setting stored in the Preset.

4.4 FX LOOP

SmartLoop™ is a special effects routing circuit offering a switchable Parallel/Serial effects loop for patching in external effect devices. Its status is stored in each Preset, that is, whether it is on or off and configured in a parallel or serial circuit.

4.4.1 SERIAL

Switches the effects loop from Parallel (LED does not light up) to Serial (LED lights up).

4.4.2 FX ON

Switches the effects loop on (LED lights up) and off (LED does not light up).

Tip: If you have not inserted an effect device into the FX Loop, you can use this circuit for other purposes and store the configurations individually in each preset:

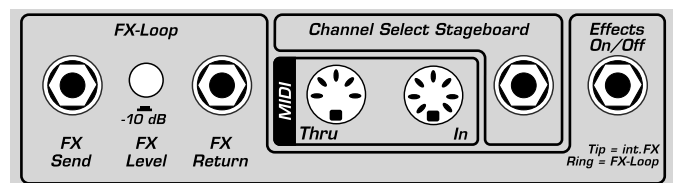
- In parallel mode, you can use the **RETURN** jack to connect a second instrument or any other audio source. You can also route the amp's signal to a second power amp.
- In serial mode, the effects loop lets you control the amp's volume remotely by simply connecting an analog Volume pedal to **SEND/RETURN**.

Caution: The signal chain is severed if the effects loop is configured serially and no effect device is connected. Send is not the best-to-mixer routing option because it accesses the preamp signal only. Patch the power amp signal to a mixing console via the Hughes & Kettner Red Box® and the speaker outputs.

5 Rear Panel Connections and Control Features

5.1 EFFECTS ON/OFF

This port accepts the two-way Hughes & Kettner® FS-2 footswitch. Button 1 switches internal effects; button 2 the external effects loop. The FS-2's LED lights up to indicate effects are active and the **FX ON** button is engaged. It does not light up if the internal effects are bypassed or the **FX ON** button is switched off.



Note: The footswitch deactivates the **FX ON** button on the front panel! When a footswitch is connected, it always has priority. The current status of the footswitch is valid when switching Channels, irrespective of the switching status stored in the preset! The front panel **FX ON** button now serves as an LED display indicating the status of the footswitch.

5.2 CHANNEL SELECT

If you ever leave your MIDI board behind, this flexible fall-back connector for footswitches will help get you through the gig. It lets you switch remotely between two Channels, say **CLEAN** and **ULTRA**, using standard one-way footswitches such as the Hughes & Kettner® FS-1. A two-way footswitch such as the Hughes & Kettner® FS-2 may also be connected. In this case, button 1 is responsible for the Channels, and button 2 is disabled. **SWITCHBLADE** even accepts the four-way Hughes & Kettner® FS-4 footswitch that ships with Hughes & Kettner® Trilogy and Matrix amp. It lets you switch all four Channels.

Note: The footswitch changes the Channels only, and not presets. That is, it activates the most recent Channel settings and it does not switch effects.

5.3 FX LOOP

If you wish to use an external effect device, you can insert it into the **FX LOOP**.

5.3.1 FX SEND

Connect this jack to your effects processor's input jack.

5.3.2 FX LEVEL

This button cuts the **FX SEND**'s output level by 10 dB and boosts the **FX RETURN**'s input sensitivity by 10 dB to match the FX Loop to the effect device's input level. Press this button when using processors designed to handle instrument levels.

5.3.3 FX RETURN

Connect this jack to your effects processor's output.

5.4 MIDI

SWITCHBLADE is MIDI-enabled, meaning that it communicates with other MIDI devices.

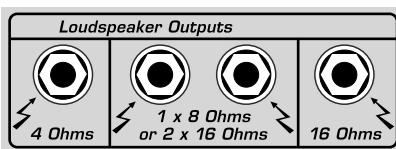
5.4.1 MIDI IN

Connect the included Hughes & Kettner[®] FSM 432 or any other MIDI sender to this port so that you can select and switch Presets remotely. Though this is a seven-pin port, you can connect a standard five-pin MIDI cable. The two additional terminals serve to supply phantom power to the FSM 432.

5.4.2 MIDI THRU

This port forwards signals patched into the **MIDI IN** port to other devices. You can connect any external MIDI-enabled signal processor or any MIDI receiver that you wish to switch synchronously with **SWITCHBLADE**.

5.5 SPEAKERS



SWITCHBLADE offers separate outputs for all standard impedances: You have 1 x 4-ohm, 1 x 8/2 x 16-ohm, and 1 x 16-ohm outputs at your disposal. Always ensure the impedance (that is, the ohm value) is correct. Mismatches can corrupt the sound (high-impedance speaker connected to a low-impedance output) and harm the amp (low-impedance speaker connected to a high-impedance output).

Note: You may of course connect several cabinets to one port, even if they have different impedances. Usually speaker cabinets are connected in Parallel. Two cabinets of the same impedance connected in Parallel have half the impedance of a single cabinet. For example, if you have two 8-ohm cabinets, you must connect these to the 4-ohm output. If you connect two cabinets with different impedances (R1, R2)

in parallel, the resulting resistance (R) is calculated by multiplying the two individual resistances and dividing their product by the sum of the individual resistances. Use the following formula to do this:

$$R = (R1 \times R2) / (R1 + R2)$$

Take as an example a one 8-ohm and one 16-ohm cabinet:

$$R = (8 \times 16) / (8 + 16)$$

$$R = 128 / 24$$

$$R = 5.33$$

The cabinets' impedance may never be lower than the amp's output impedance, so this combination must be connected to the 4-ohm output. However, we strongly advised against configuring setups with mismatched cabinets, and highly recommend using combinations of cabinets with the same impedance!

6 MIDI Control and Programming

6.1 FSM 432

The included Hughes & Kettner[®] FSM 432 MIDI board is a remote control serving to select the 128 memory slots conveniently arranged in 32 Banks of four presets each. You can easily configure setups any way you wish, say by assigning the four presets of a bank to a song.



6.1.1 PRESET A B C D

Presets within a bank can be activated directly, that is, switching from A to B within the same bank occurs immediately. The LED above the A,B,C,D buttons indicates the preset.

6.1.2 BANK UP/DOWN

If you want to call up a preset in another bank, you can select the bank via **UP** and **DOWN** while continuing to play using the current preset. The number of the bank is indicated in the display, and it flashes until you select a preset via A,B,C,D. Not until then will **SWITCHBLADE** load the new preset.

DIRECT MODE is available if you wish to trigger a direct program change via bank Up/Down. In this mode, the FSM 432 will not wait for your input, instead switching immediately, for example, from preset B in bank 16 to preset B in bank 17 (**UP**) bank or 15 (**DOWN**). Direct Mode is activated as follows:

- Press and hold **TAP**, and then press **PRESET A**.
- First release **PRESET A**, and then **TAP**: The decimal point in the display lights up.

Follow the same sequence to deactivate **DIRECT MODE**. Volatile rather than permanent, **DIRECT MODE** is automatically deactivated when you power **SWITCHBLADE** down!

6.1.3 TAP

The **TAP** function gives you a very fast and convenient option for changing the Delay's **TIME** parameter. **TAP** comes in particularly handy on stage: Simply tap your foot on the **TAP** button in Time with the groove to match delay Time to the tempo. The effect adopts the new time after the second tap. The **TAP** LED flashes for about five seconds in time with the beat to give you a visual indication of the delay time.

Note: The TAP function works only when the DELAY is active. If the DELAY is off, the effect will not adopt your TAP tempo.

6.1.4 Switching External Devices via the FSM 432, Setting the MIDI Send Channel

If you wish to switch devices connected to **SWITCHBLADE MIDI THRU** – say, a MIDI effect device – using the FSM 432, ensure the effect device is set to the FSM 432's MIDI Channel or to **OMNI**. Consult the device's manual for more info.

To set the FSM 432's MIDI Send Channel, proceed as follows:

- Turn **SWITCHBLADE** on while pressing the FSM 432's **PRESET A** button. The display flashes.
- Release button A. Use **UP/DOWN** to view and set the MIDI Channel to a number between 1 and 16.
- Quit and store by pressing the **PRESET A** button.

Caution: If SWITCHBLADE and FSM 432 are not set to the same MIDI channel, the amp will not respond to program changes! Activating OMNI solves the problem in the event of an "emergency." See chapter 6.2 to learn more.

Note: If an external effect device is connected to MIDI THRU and you want to switch Switchblade and the effect device simultaneously with the same program change command, you must configure Switchblade's Store function and program this device accordingly.

Note: The table above should be big help if you wish to switch the Presets of a device connected to the MIDI THRU directly via the FSM 432. It shows the program changes sent by the bank/preset combination. Please bear in mind that some MIDI devices switch program 1 via program change command 0. If this is the case with your outboard gear, simply add a 1 to each value indicated in this table to activate the desired program.

Bank	Preset	Programchange Number	Bank	Preset	Programchange Number	Bank	Preset	Programchange Number	Bank	Preset	Programchange Number
1	A	0	9	A	32	17	A	64	25	A	96
1	B	1	9	B	33	17	B	65	25	B	97
1	C	2	9	C	34	17	C	66	25	C	98
1	D	3	9	D	35	17	D	67	25	D	99
2	A	4	10	A	36	18	A	68	26	A	100
2	B	5	10	B	37	18	B	69	26	B	101
2	C	6	10	C	38	18	C	70	26	C	102
2	D	7	10	D	39	18	D	71	26	D	103
3	A	8	11	A	40	19	A	72	27	A	104
3	B	9	11	B	41	19	B	73	27	B	105
3	C	10	11	C	42	19	C	74	27	C	106
3	D	11	11	D	43	19	D	75	27	D	107
4	A	12	12	A	44	20	A	76	28	A	108
4	B	13	12	B	45	20	B	77	28	B	109
4	C	14	12	C	46	20	C	78	28	C	110
4	D	15	12	D	47	20	D	79	28	D	111
5	A	16	13	A	48	21	A	80	29	A	112
5	B	17	13	B	49	21	B	81	29	B	113
5	C	18	13	C	50	21	C	82	29	C	114
5	D	19	13	D	51	21	D	83	29	D	115
6	A	20	14	A	52	22	A	84	30	A	116
6	B	21	14	B	53	22	B	85	30	B	117
6	C	22	14	C	54	22	C	86	30	C	118
6	D	23	14	D	55	22	D	87	30	D	119
7	A	24	15	A	56	23	A	88	31	A	120
7	B	25	15	B	57	23	B	89	31	B	121
7	C	26	15	C	58	23	C	90	31	C	122
7	D	27	15	D	59	23	D	91	31	D	123
8	A	28	16	A	60	24	A	92	32	A	124
8	B	29	16	B	61	24	B	93	32	B	125
8	C	30	16	C	62	24	C	94	32	C	126
8	D	31	16	D	63	24	D	95	32	D	127

6.2 Setting Switchblade's MIDI Channel and Switching OMNI ON/OFF

Press the **SERIAL** button longer than two seconds when **SWITCHBLADE** is in normal operating mode, and the **ORIGINAL VALUE** LED will start flashing. This assigns special programming functions to the amp's LEDs and buttons:

FX ON

Now serves as a +1/**UP** button for setting the MIDI Channel.

Serial

Now serves as a -1/**DOWN** button for setting the MIDI Channel.

Store

OMNI ON/OFF switches. If the **STORE** button (OMNI On) lights up, **SWITCHBLADE** responds to all incoming program changes, irrespective of the MIDI Channel over which they are sent. If the light on the button is extinguished (**OMNI OFF**), it responds only to messages sent via the defined MIDI Channel.

FACTORY SETTING: MIDI CHANNEL = 1, OMNI = ON

Note: OMNI ON is helpful if you are unsure via which channel a connected MIDI device sends its messages.

During the MIDI setup routine, the LEDs that normally indicate the preamp Channel indicate the MIDI Channel. The following table MIDI Channel lists the MIDI Channel settings in what is called binary code:

MIDI-Kanal	Boost	Clean	Lead	Ultra
1	●	●	●	●
2	●	●	●	☀
3	●	●	☀	●
4	●	●	☀	☀
5	●	☀	●	●
6	●	☀	●	☀
7	●	☀	☀	●
8	●	☀	☀	☀
9	☀	●	●	●
10	☀	●	●	☀
11	☀	●	☀	●
12	☀	●	☀	☀
13	☀	☀	●	●
14	☀	☀	●	☀
15	☀	☀	☀	●
16	☀	☀	☀	☀

Press and hold **SERIAL** for a few moments to quit the MIDI setup routine and store the settings. The amp returns to its most recent operating status (normal mode).

6.3 Factory Settings and Factory Reset

A factory reset is a seldom needed feature. Nevertheless, be sure to read the explanation carefully to ensure you don't accidentally delete your presets.

6.3.1 Triggering a Factory Reset

If you press **STORE** and **FX SERIAL** simultaneously while powering the amp, all settings are reset, including the 128 MIDI-switchable presets and the basic MIDI configuration.

6.3.2 Factory Presets and Basic MIDI Configuration

The A to D presets of all banks correspond the channel settings; that is, all 32 banks have the same settings: Preset A corresponds to Clean, B to Crunch, C to Lead, and D to the Ultra Channel.

The basic MIDI configuration is:

- **OMNI ON**
- **FX ON** is switched off.
- MIDI Channel: 1
- **SERIAL** is deactivated.

CAUTION: This procedure is a last-resort option! It irrevocably wipes out all stored settings.

6.4 Storing Settings/Programming

You have two options for storing a preset to one of the 128 memory slots: Select a new memory slot via MIDI (6.4.1) or overwrite the preset directly at the device (6.4.2).

6.4.1 Selecting a New Memory Slot via MIDI Learn

- Press the **STORE** button briefly; it lights up to signify that it is armed (MIDI Learn).
- Select a MIDI bank from 1 to 32 on the FSM 432; it flashes to signify that the FSM 432 is waiting for input via one of the four preset buttons A to D.
- Engage preset button A,B,C or D; the board stops flashing, the light on the **STORE** button extinguishes, and the preset is stored.

Caution: When the FSM 432 is in DIRECT MODE (see chapter 6.1.2), a BANK UP/DOWN command also triggers the storage process! We recommend deactivating Direct Mode when programming to prevent inadvertent overwriting of presets.

*Note: Here's how to proceed for other manufacturers' MIDI boards and MIDI-enables devices: Arm SWITCHBLADE by engaging the **STORE** button and selecting the desired memory slot. As soon as SWITCHBLADE receives a valid program change command, the **STORE** button extinguishes and the preset is stored.*

If an error occurs (the amp remains armed), you can cancel the storage process by pressing **STORE** again.

6.4.2 Overwriting Presets Directly at the Device

There is an easier way to overwrite the most recently selected preset than going from the amp to the MIDI board and back after every edit: Press and hold the **STORE** button until its light extinguishes (after about two seconds). The **ORIGINAL VALUE** and the Channel LEDs also flash to confirm. Then you can release the **STORE** button and your settings are stored.

7 Replacing Tubes, Service and Preventive Maintenance

SWITCHBLADE is factory-loaded with EL34 and 12AX7 tubes. Once they've been burned in – that is, operated continuously under a load – they are subjected to a rigorous selection process. Their electrical specs and mechanical status (microphonics) are checked, and then they are installed in an amp and their sonic performance is auditioned. One of the most important steps in this process is tube matching, whereby tubes with the same characteristics are teamed up in matched sets of power tubes.

When to Replace Tubes

The tubes in **SWITCHBLADE** are exemplary in terms of quality, workman-ship and long service life. Nonetheless, tubes show definite signs of wear when their service life is nearing its end. Telltale signs are increased microphonics, noise and hiss, muddier tone through loss of high-end frequencies, degraded performance, etc. Take these indications seriously and replace old tubes. Not only do these side effects take their toll on sound quality, they also indicate the aging tube will soon fail!

Note: Replacing tubes for experimentation purposes is not recommended. Installing the wrong tubes will damage the amp and cost you a lot more than you bargained for in repair costs.

Before you start swapping tubes, ask yourself these questions:

- Was the fault or failure of the tube caused by the tube itself or by a flawed peripheral device or component, perhaps a defective speaker cable? If you don't get to the bottom of the problem and remedy it, it may crop up again even after you replace the tubes.
- Did the Mains voltage fluctuate or spike while the amp was on? In all-tube amps, over-voltage surges in the Mains net can certainly cause drop-outs. Over-voltages are often caused by generators and faulty high-current power circuits.
- Perhaps a fuse blew even though none of the tubes is actually defective? An old fuse, tube de-ionization or Mains voltage power surges may have triggered the fuse.

Things to Bear in Mind When Replacing Tubes

Replacing tubes is a job best left to qualified professionals!

Accordingly, the following guidelines are addressed and apply to qualified service technicians only:

- Pull Switchblade's Mains plug and allow for a discharge time of at least two minutes before removing the chassis from the rear of the amp.
- Once the chassis has been removed, carefully ease the tubes out of their sockets.
- A single power tube may only be replaced if the replacement tube precisely matches the original, that is, the old and new tubes' characteristics are identical.
- When a new matched set of power tubes with characteristics identical to the old set is installed, it is not absolutely necessary to re-bias the amp.
- The amp must be biased when a replacements set's characteristics do not match the original set's. This requires experience and extensive working knowledge in measuring techniques, which is why this is a job for qualified technicians with tube amp tuning experience.

How to Prolong Tube Life

- Never operate Switchblade without connecting a load (loudspeaker)!
- Never connect speaker cabinets with an impedance that is too high or low!
- Always use high-quality, heavy-duty speaker cords that won't crimp!
- Use the **STANDBY** switch for short breaks!
- Avoid exposing the amp to vibrations, especially when it's powered up.
- Switch the amp off well before transporting it to allow tubes to cool off completely.
- Make sure all peripheral devices and connecting cords are in a state of good repair!
- Ensure air can circulate freely around the amp's ventilation slots at all times!
- Never expose Switchblade to extreme heat or cold!
- Prevent the intrusion of dust and moisture!
- Always check peripheral gear's specs to ensure these accessories are suitable for the amp.
- Never connect devices with high output signal Levels to Switchblade's Input.
- Never operate the amp with Mains power that is too high or too

low. When in doubt ask the venue's sound technician or facility engineer.

- Refrain from DIY repairs! Also have a qualified technician replace internal fuses.

8 Troubleshooting

Mains connection: SWITCHBLADE

won't power up when you switch it on.

- It's not getting AC power. Check the Mains cord to see if it is connected and firmly seated.
- The Mains fuse is defective. Ensure it is replaced with another fuse bearing the same rating.
- The local Mains voltage does not match Switchblade's operating voltage

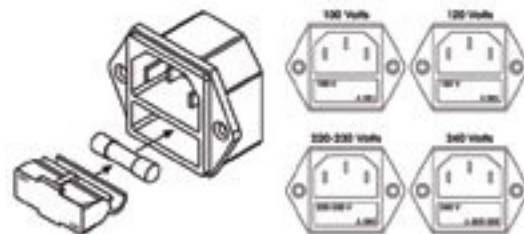
Available Voltages and How to Adapt Them


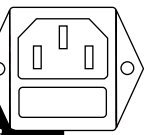
Switchblade ships in two versions rated for 110/120V and 220-240V.


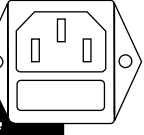
You will find the rating indicated on the housing above the Mains socket. Both models offer two operating voltages that are selected using the voltage selector integrated in the Mains socket. Ensure that the Mains voltage matches the voltage rating appearing in the voltage selector window. This value is legible when the amp is in the standard operating position, that is, placed right side up. The upright number indicates the currently selected voltage, and the inverted number indicates the alternative voltage. Check also the fuse ratings to ensure they match the ratings indicated on the rear panel.

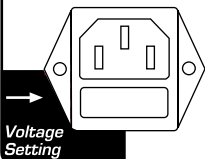
Voltage selection and fuse replacement may be performed by experienced service technicians only. Accordingly, the following notes are addressed exclusively to service technicians:

- Use a small flat screwdriver to remove the voltage selector from the Mains socket.
- If the fuse is defective, replace it with a fuse bearing the specified rating.
- Turn the voltage selector and insert it back into the port so that the desired Mains voltage rating is legible and appears at the top left (next to the "Voltage Setting" arrow).

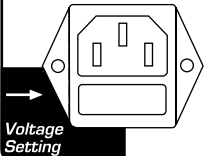


		Input: 220 - 230 V~ 240 V~ 50 - 60 Hz Max. Power Consumption 440 Watts	Replacing fuses only to be carried out by qualified service personnel! Replace fuses only with type and rating shown below: Setting: 220 - 230 V → Fuse: 250 V/T 1.6 A Setting: 240 V → Fuse: 250 V/T 1.6 A
		HEAD / COMBO 100	

		Input: 100 /120 V~ 50 - 60 Hz Max. Power Consumption 440 Watts	Replacing fuses only to be carried out by qualified service personnel! Replace fuses only with type and rating shown below: Setting: 100 V → Fuse: 250 V/T 4 A Setting: 120 V → Fuse: 250 V/T 4 A
---	--	--	--

	Input: 220 - 230 V~ 240 V~ 50 - 60 Hz Max. Power Consumption 290 Watts	Replacing fuses only to be carried out by qualified service personnel! Replace fuses only with type and rating shown below:
		Setting: 220 - 230 V → Fuse: 250 V/T 1A
		Setting: 240 V → Fuse: 250 V/T 1A

COMBO 50

	Input: 100 /120 V~ 50 - 60 Hz Max. Power Consumption 290 Watts	Replacing fuses only to be carried out by qualified service personnel! Replace fuses only with type and rating shown below:
		Setting: 100 V → Fuse: 250 V/T 2 A
		Setting: 120 V → Fuse: 250 V/T 2 A

Switchblade is connected properly, but no sound is audible.

- The guitar's **VOLUME** knob is turned all the way down.
- The amp is set to **STANDBY**.
- The amp's **VOLUME** knob is turned all the way down.
- The effects loop is active and set to **SERIAL**, but no effect device is connected.
- The anode fuse has blown. Ensure that it is replaced with a fuse of the same rating.
- The fuse for the tube heating tripped (the tubes don't glow). Ensure that it is replaced with a fuse bearing the same rating.

The amp makes ringing noises when played and tends to Feedback.

- One or several tubes are microphonic. Replace the defective tube with another of the same type.

Signs of tube wear such as increased microphonics and noise, Treble loss, weak power output or muddy sound begin reappearing just a few hours after replacing tubes.

- The wrong tubes were installed when old tubes were replaced or the amp was not biased properly. Take the amp to a professional to correct the problem.

The sound is washed out or muddy when you switch an effects processor on.

- The signal processor provides a wet signal that is blended with the dry or original signal. Depending on the type of effect, the processor may be returning a dry signal back along with wet signal, which causes phase cancellations when mixed to the dry signal in Switchblade's Parallel loop. To prevent this, set the effects loop to **SERIAL** or turn the dry signal all the way down on the signal processor.

9 Technical Specifications

All level indications relate to 0 dBV (1V RMS).

9.1 Inputs

INSTRUMENT Input

Input:	6.3 mm (1/4") jack
Type:	unbalanced
Input impedance:	1 MW
Sensitivity:	- 50 dB (Clean Channel)
Max. Input Level:	0 dB

FX Return

Input:	6.3 mm (1/4") jack
Type:	unbalanced
Input impedance:	48 k W
Max. sensitivity:	-10dB button engaged: - 21 dB, disengaged: - 11 dB
Max. Input Level:	-10dB button engaged: + 0 dB, disengaged + 10 dB

MIDI IN

Port:	DIN 45 329 (7-pin)
Data reception:	Program change data, Tap Delay function
Channels:	16, Omni mode
Power supply:	15V DC max. 200mA, pin 6 = positive, pin 7 = negative

9.2 Outputs

FX Send

Output:	6.3 mm (1/4") jack
Type:	unbalanced
Output impedance:	2.2 k W
Output Level:	+ 3 dB
Max. output Level:	-10dB button engaged: - 2 dB, disengaged: + 8 dB

MIDI THRU

Port:	DIN 45 328 (5-pin)
Data handling:	All data sent to MIDI IN are patched out unchanged.

Speaker Outputs

6.3 mm (1/4") jacks:	1 x 4 ohms, 2 x 16 ohms / 1 x 8 ohms, 1 x 16 ohms
----------------------	--

Speaker

100 Combo	2 x 12" Eminence® Rockdriver 60
50 Combo	1 x 12" Eminence® Rockdriver 60

9.3 General Electrical Data

Switchblade 100 Head/Combo	Switchblade 50 Combo
Max. current consumption:	
440 watts	290 watts

Max. power consumption:	
1.75A @ 240 volts	0.97A @ 240 volts
1.89A @ 220-230 volts	1.07A @ 220-230 volts
3.50A @ 117-120 volts	2.00A @ 117-120 volts
3.95A @ 100 volts	2.15A @ 100 volts

Mains voltage tolerance range: +/- 10 %

External fuses (anode):	
1 x T 630 mA	1 x T 400 mA

Internal fuses:	
1 x TT 10 A Slo Blo	1 x TT 10 A Slo Blo
2 x T 630 mA	2 x T 630 mA

Mains fuse (5 x 20 mm):	
Europe: (variable: 220 V-230 V / 240 V	
1 x 250 V / T 1.6 A	1 x 250 V / T 1 A
USA/Canada/Asia:(variable: 100 V / 120 V)	
1 x 250 V / T 4 A	1 x 250 V / T 2 A

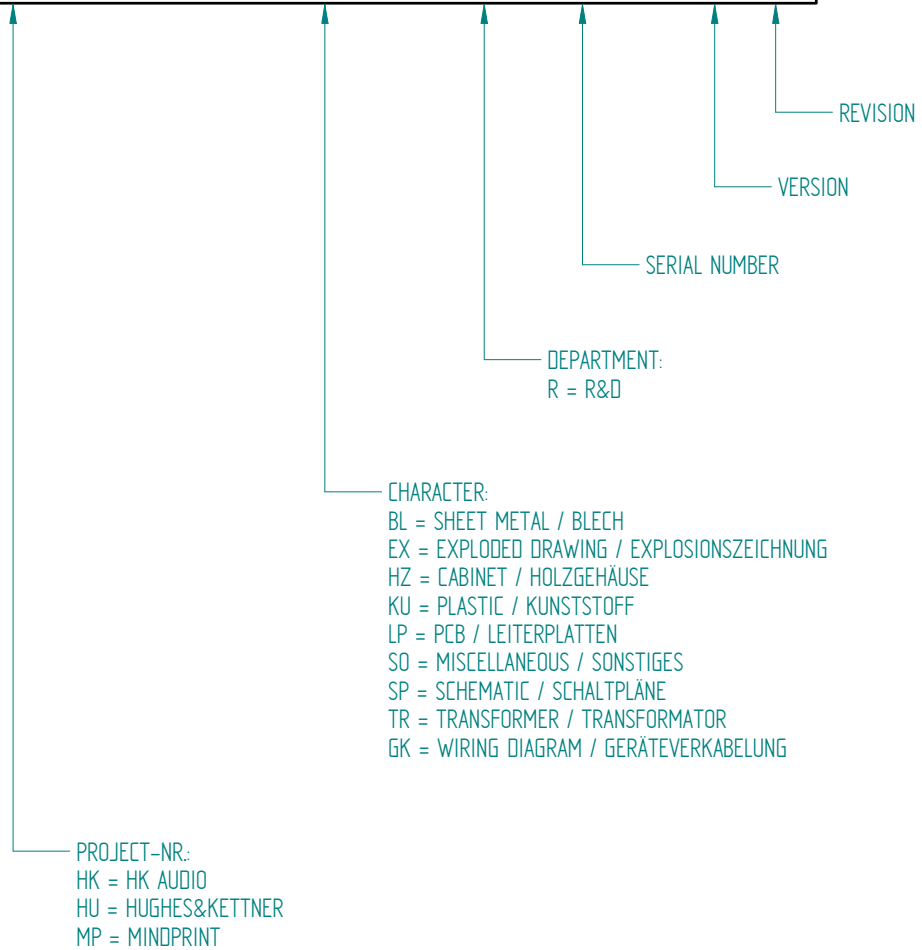
Ambient operating temperature range:	
0 °C to + 35 °C	0 °C to + 35 °C

9.4 General Mechanical Data

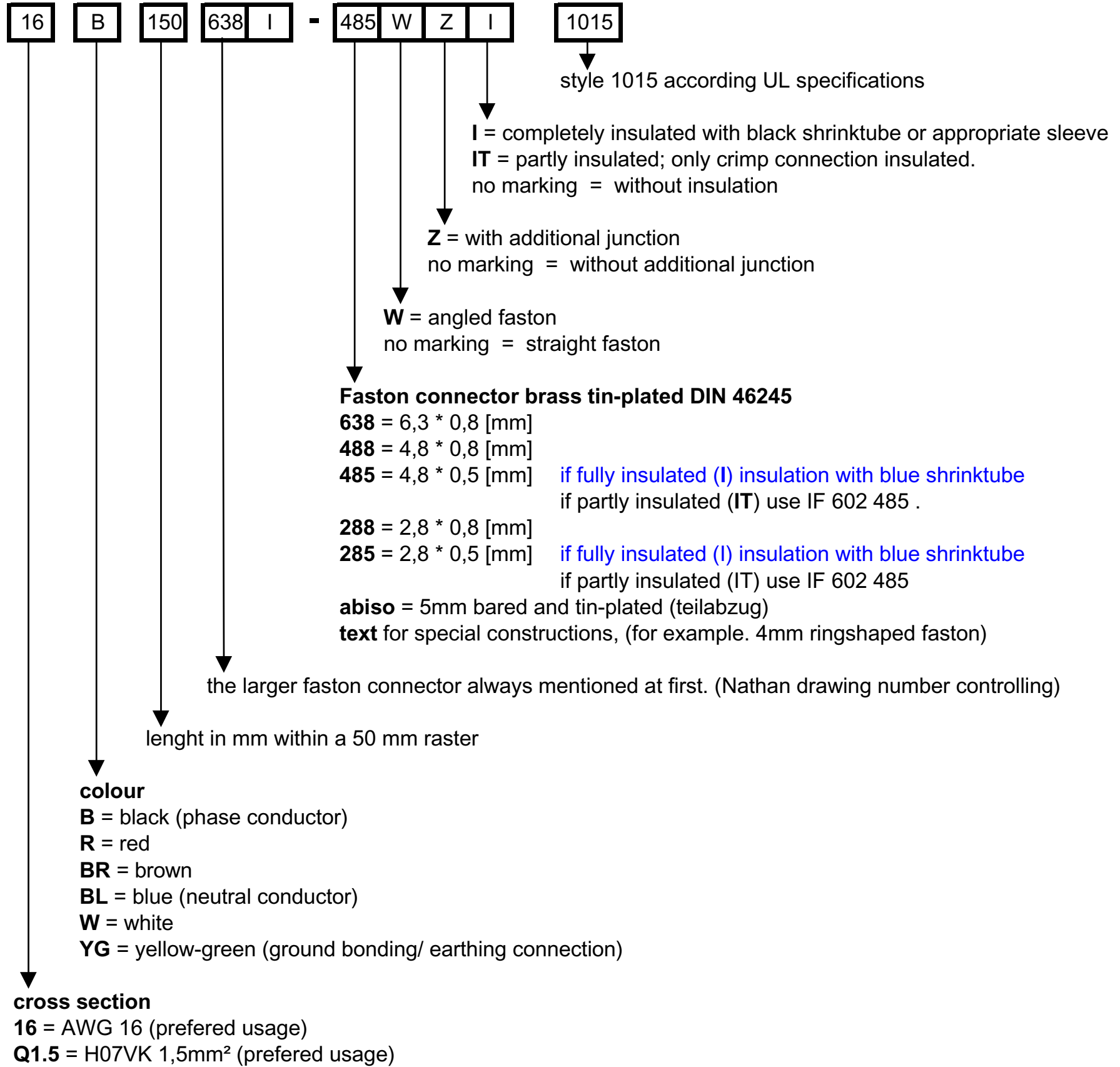
	100 Head	100 Combo	50 Combo
Dimensions: (including corners, handles, feet)			
Width:	750 mm	647 mm	600 mm
Height:	280 mm	500 mm	500 mm
Depth:	258 mm	285 mm	285 mm
Weight:	17.6 kg	30.3 kg	22.8 kg

DRAWING-NUMBERS EXAMPLE

HK0106-EX-R01-1A



Standard for single wire confection.



wire designation:

P + lfd Nr. = AWG single wire black, red, blue, brown or white

E + lfd Nr. = AWG single wire green- yellow

L + lfd Nr. = twisted AWG double wire, length specification always in twisted condition

FQL + lfd Nr. = crossover wiring H07VK

Regarding special wirings like wiring harness or similar, drawings will be prepared and appropriate drawing numbers will be stored in the article archive.



Service Documents

HU1405

SwitchBlade Head

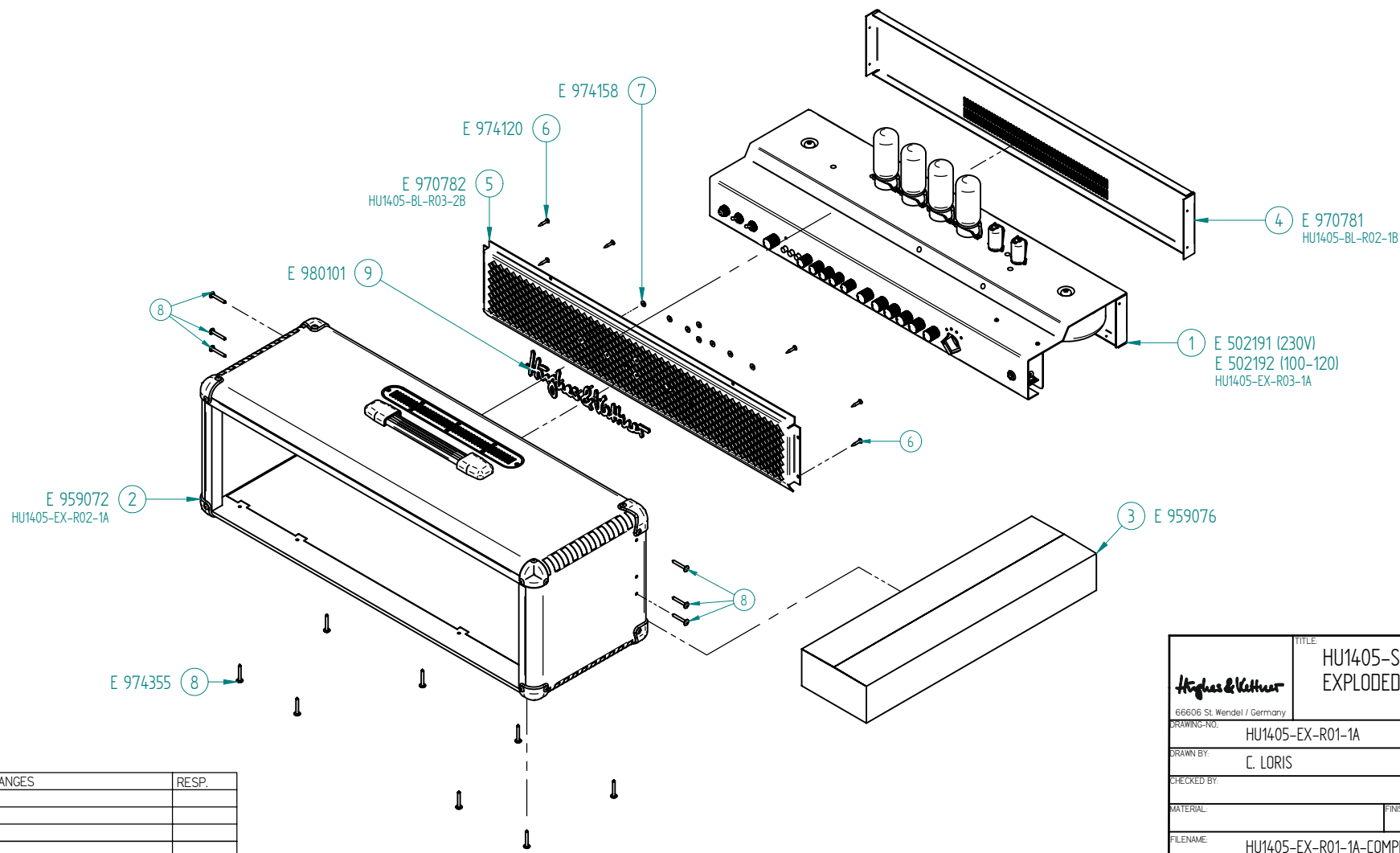
***Confidential, for authorized service technicians only!
Do not disclose this information to or share these documents with third parties.***



TECHNICAL SERVICE:

***Stamer Musikanlagen GmbH • Magdeburger Str. 8 • 66606 St.Wendel • Germany
Music & Sales P.E. GmbH • Leipziger Str. 3 • 66606 St.Wendel • Germany***

pos.	part-no. 1	part-no. 2	part-no. 3	description	Beschreibung	quantity
1	502191 (230V)	502192 (100-120)		chassis SwitchBlade Head	Chassis SwitchBlade	1
2	959072			SwitchBlade Head cabinet complete	SwitchBlade Head Holzgehäuse komplett	1
3	959076			MIDI Footswitch FSM-432	MIDI Footswitch FSM-432	1
4	970781			sheet metal SwitchBlade rear panel	Blech SwitchBlade Rückwand	1
5	970782			sheet metal SwitchBlade front grille	Blech SwitchBlade Frontgitter	1
6	974120			ABC-Spax S, countersunk head, Pozidrive, 3.5x20. black	Spax Senkkopf, 3,5*20 sw	6
7	974158			snapon retaining ring (for logo)	Schnellbefestiger f. Logo	8
8	974355			cross recessed panhead tapping screw with collar, 3.9x30, black	Blehschr. KFR-Kopf 3,9* 30 sw	14
9	980101			Logo 3-teilig Silber	Logo 3-teilig Silber	1

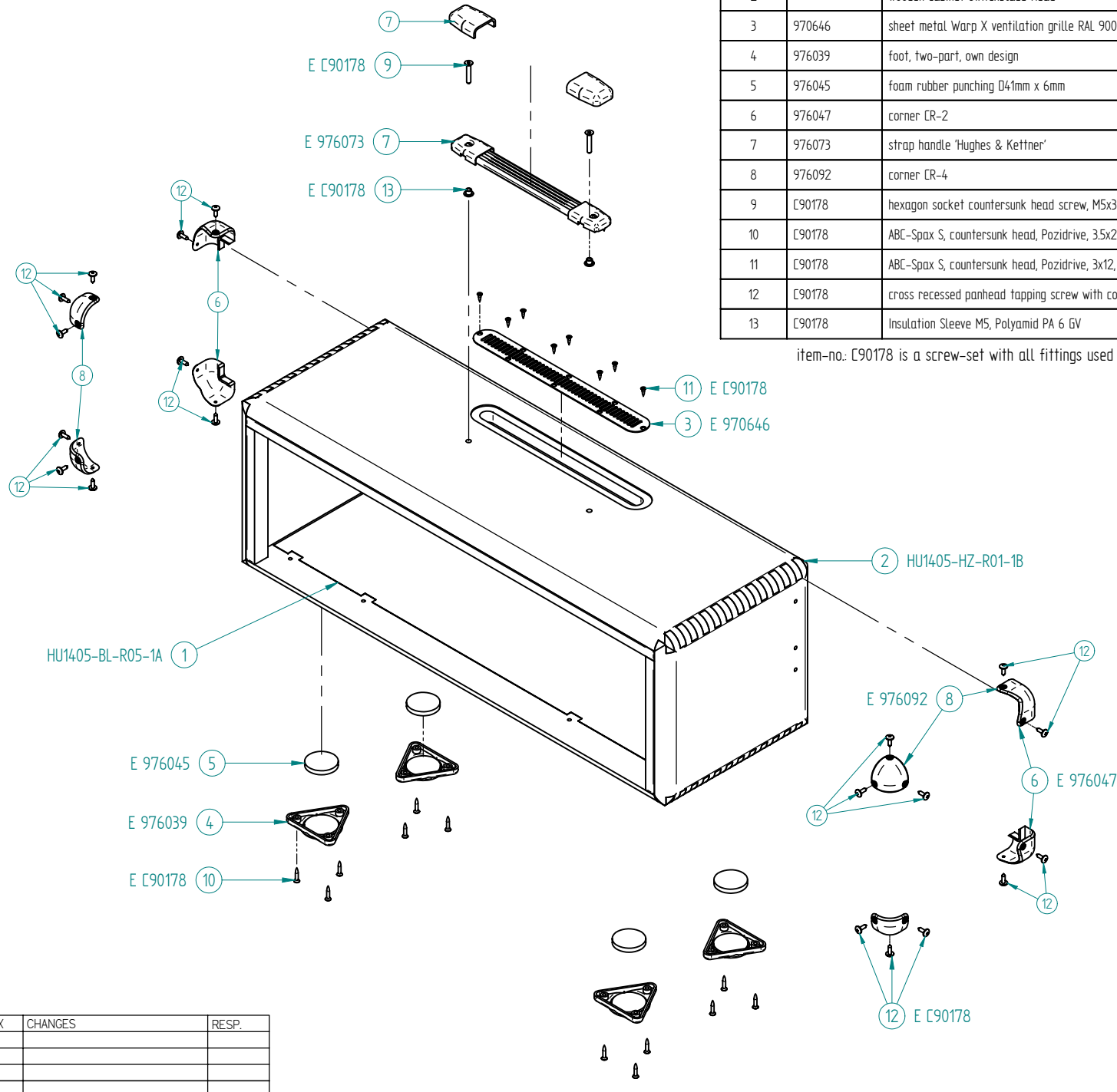


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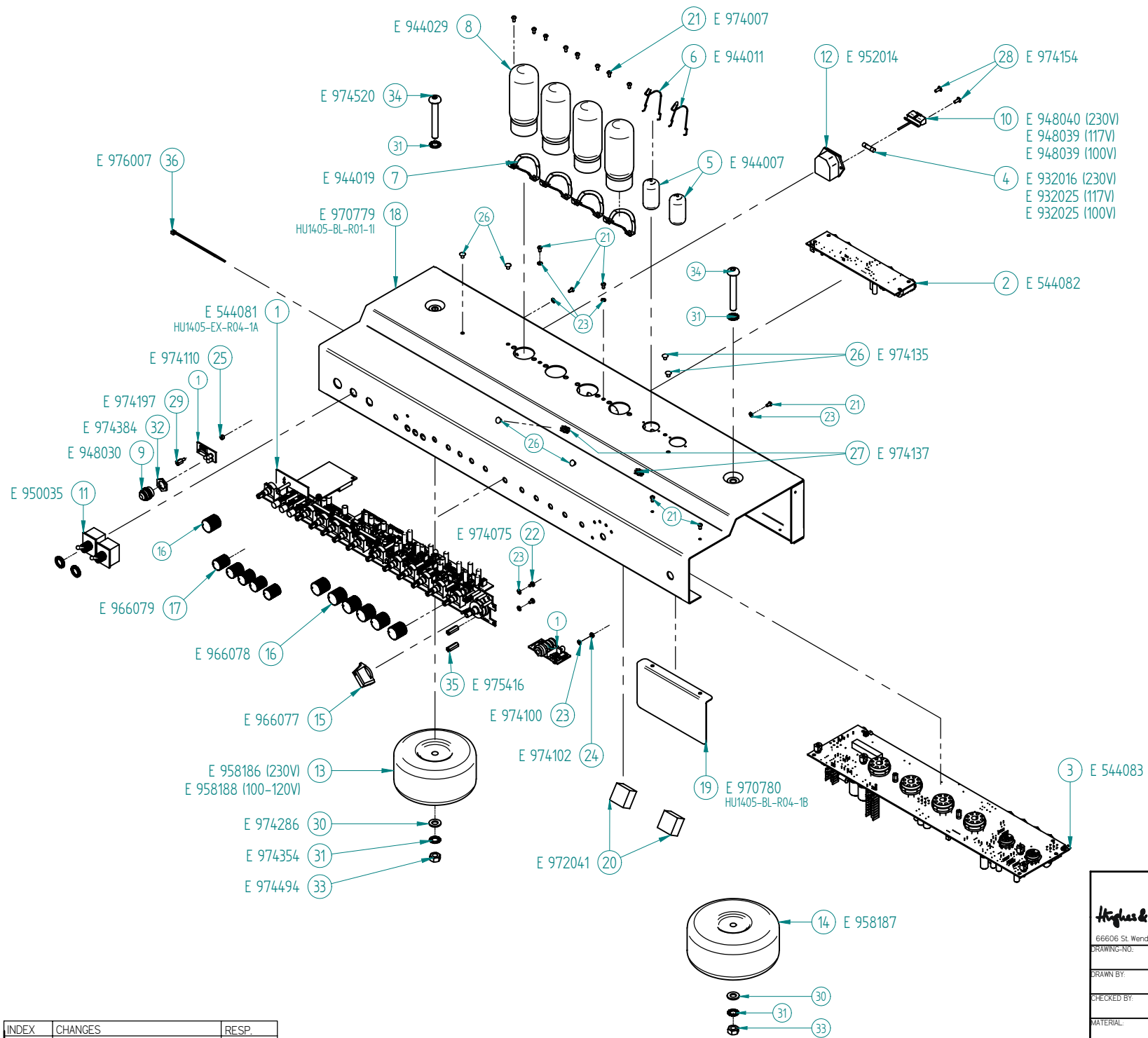
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1		shielding plate SwitchBlade Head	Schirmplatte SwitchBlade Head	1
2		wooden cabinet SwitchBlade Head	Holzgeh. SwitchBlade Head	1
3	970646	sheet metal Warp X ventilation grille RAL 9005	Blech Warp X Lüftungsgitter RAL 9005	1
4	976039	foot, two-part, own design	Fuss, 2 Teile, eigenes Design	4
5	976045	foam rubber punching D41mm x 6mm	Moosgummi-Stanzteil D41mm x 6mm	4
6	976047	corner CR-2	Ecke Corner CR-2 f. 20mm Mat.par	4
7	976073	strap handle 'Hughes & Kettner'	Bandgriff 'Hughes & Kettner'	1
8	976092	corner CR-4	Ecke Corner CR-4	4
9	E 90178	hexagon socket countersunk head screw, M5x30, black	Inbussenschraube M5x30 sw	2
10	E 90178	ABC-Spax S, countersunk head, Pozidrive, 3,5x20, black	Spax Senkkopf, 3,5*20 sw	12
11	E 90178	ABC-Spax S, countersunk head, Pozidrive, 3x12, black	Spax Senkkopf, 3*12 sw	8
12	E 90178	cross recessed panhead tapping screw with collar, 3,9x13, black	Blechschr. KFR-Kopf 3,9*13 sw	20
13	E 90178	Insulation Sleeve M5, Polyamid PA 6 GV	Isolierbuchse M5	2

item-no.: E 90178 is a screw-set with all fittings used in HU 1405-SwitchBlade Head Cabinet



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FILENAME:			
HU1405-EX-R03-1A-Chassis			

INDEX	CHANGES	RESP.

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1	544081			Switchblade Preamp	54 Switchblade Preamp	1
2	544082			SwitchBlade FX board	SwitchBlade FX Board	1
3	544083			SwitchBlade Power Amp	SwitchBlade Power Amp	1
4	932016 (230V)	932025 (117V)	932025 (100V)	microfuse slowblow 1,6A 5x20 IEC 127(230V); 4,0A (117/100V)	Feinsicherung 1,6A Trage 5x20 IEC 127(fur 230V); 4,0A Tragelfur 117/100V)	1
5	944007			tube ECC83-CZ Tesla	Rohre ECC83-CZ Tesla	2
6	944011			Tubeclamp	Rohrenhalteclasp VRA 10.01	2
7	944019			Tube Bracket 6L6GC	Rohrenhalteklammer 6L6GC	4
8	944029			power tube EL34B China	Endst. Rohre EL34B STR China	4
9	948030			FPLR lens for PilotLight blue	FPLR Linse fur PilotLight blau	1
10	948040 (230V)	948039 (117V)	948039 (100V)	fuse case for power inlet	SI-Einsatz Netzbuchse	1
11	950035			mains switch, rocker, on-on	Netzschalter-Kipphebel-on-on	2
12	952014			power inlet MS3 SKT MS-3	Euronetzbuchse MS3 SKT MS-3	1
13	958186 (230V)	958188 (100-120V)		mainstransformer TI-053252 EU/UK (230V); TI-053253 JP/US (100-120V)	Ringkerntrafo TI-053252 EU/UK (230V); TI-053253 JP/US (100-120V)	1
14	958187			Power Audio Transformer TI-053434 100W	ubertrager TI-053434 100W	1
15	966077			knob Modern Tube	Knopf-Poti Modern Tube	1
16	966078			Chrome Knob big 18mm, straight knurled with dot	Knopf Chrome Knob big 18mm	7
17	966079			Knopf Chrome Knob small 15mm, straight knurled with dot	Knopf Chrome Knob small 15mm	5
18	970779			sheet metal chassis, Switchblade	Blech Chassis Switchblade	1
19	970780			sheet metal shielding plate	Blech Switchblade Schirmblech	1
20	972041			rubber punching 25x25x15	Zellkauf.-Stanzteil 25x25x15mm	2
21	974007			hexagon socket oval head screw, M3x6, black	Linsenschr.m.Innens. M3*6 sw	14
22	974075			cross recessed panhead screw, M3x5, zinc plated	Linsenschraube M3x5 vz	2
23	974100			toothed lock washer, D=3,2, AZ, black zinc plated	Facher-Scheibe az, 3,2 sw vz	7
24	974102			hexagon nut, class 8, M3, zinc plated	Sechskantmutter M3 vz	1
25	974110			self locking hexagon nut with plastic insert, M3, zinc plated	Stopfmutter M3 vz	1
26	974135			spread rivet, polyamid PA6, 4x5, black	PA-Spreiznief D=4mm L=5mm	6
27	974137			RICHCO, PCB spacer, snap in, H=11,1mm	Dist.Halter RICHCO H=11,1mm	2
28	974154			blind rivet steel standard, 3,0x8, black	Blindniete Stahl schw. 3,0*8	2
29	974197			hexagon PCB spacer, type B, M3x8, zinc plated	Dist. Bol. Innen/Auengew. M3*8 vz	1
30	974286			washer, form A, D=8,4mm, black	Unterleg.-Scheibe 8,4 sw	2
31	974354			toothed lock washer, D=8,4, AZ, black zinc plated	Facher-Scheibe az, 8,4 sw	4
32	974384			nut M14 brass	Mutter FPLR Linse geschliffen	1
33	974494			hexagon nut, class 8, M8, black	Sechskantmutter M8 sw	2
34	974520			hexagon socket oval head screw, M8x60, black	Linsenschr.m.Innens. M8*60 sw	2
35	975416			hexagon PCB spacer, M3x17, zinc plated	Dist. Bol. 2"innengew. M3*17 vz	2
36	976007			cable tie 2,5x100 (mm)	Kabelbinder natur 2,5x100 (mm)	12

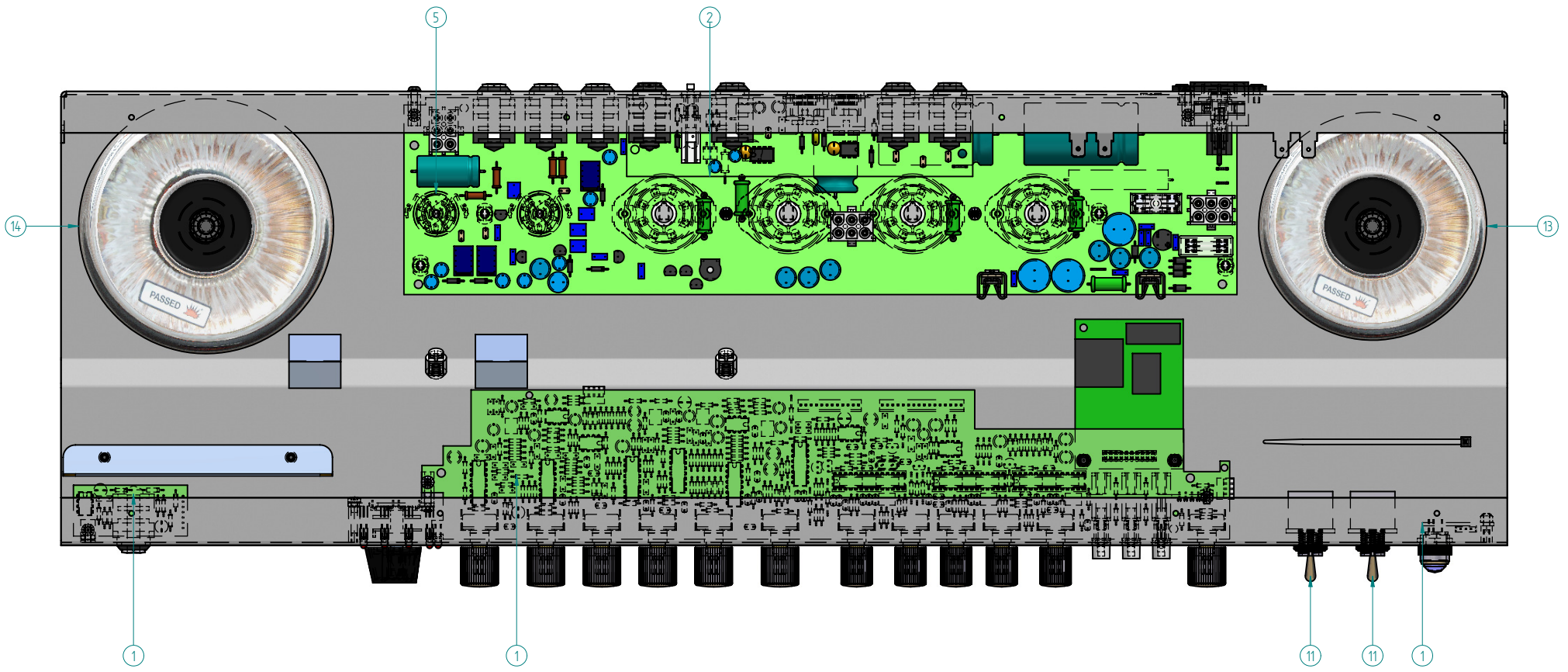
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TITLE:
**HU1405-SWITCHBLADE HEAD
EXPLODED DRAWING CHASSIS**

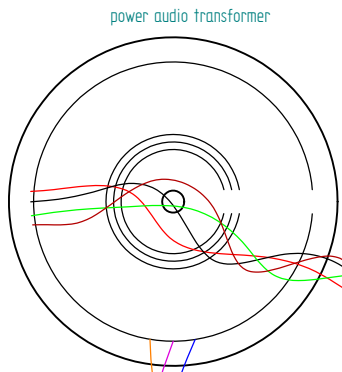
Hughes & Kettner

66606 St. Wendel / Germany

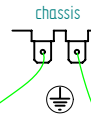
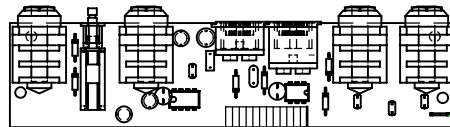


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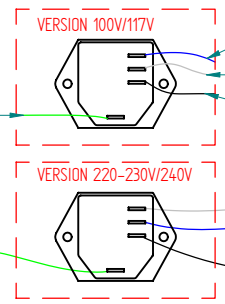
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66606 St. Wendel / Germany			
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REVISION		DATE	13.07.2006
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CHECKED BY:		DATE:	
			4 PAGES
MATERIAL:		FINISH:	n/a
FILENAME:	HU1405-EX-R03-1A-Chassis		



power audio transformer



E 962103



VERSION 100V/117V

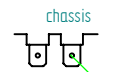
VERSION 220-230V/240V

blue 100V
white 117V
E 962340

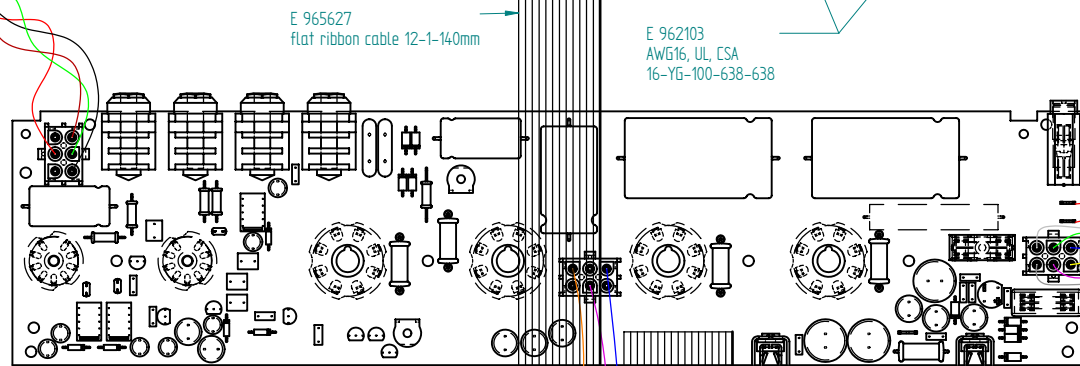
white 245V
blue 230V

power inlet

E 962340
AWG16, UL, CSA
16-B-300-6381-4881



chassis



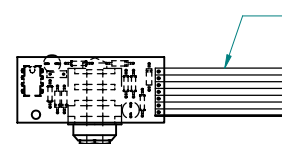
E 965627
flat ribbon cable 12-1-140mm

E 962103
AWG16, UL, CSA
16-YG-100-638-638

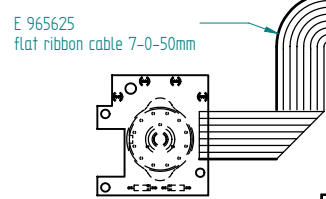
maintransformer

E 962184
AWG16, UL, CSA
16-R-200-4881-4881

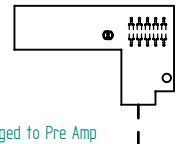
E 965321
flat ribbon cable 16-1-130mm



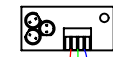
E 965624
flat ribbon cable 7-0-220mm



E 965625
flat ribbon cable 7-0-50mm



plugged to Pre Amp



E 962054
stranded wire 2xJST 3pol, 140mm
AWG 26 style 1007

pos.	part-no. 1	part-no. 2	part-no. 3	description	Beschreibung	quantity
1	962054			stranded wire 2xJST 3pol 140mm	Litze 2xJST 3pol 140mm	1
2	962103			stranded wire 16-YG-100-638-638 AWG, UL, CSA	Litze 16-YG-100-638-638 AWG, UL, CSA	2
3	962184			stranded wire 16-R-200-4881-4881 AWG, UL, CSA	Litze 16-R-200-4881-4881 AWG, UL, CSA	2
4	962340			stranded wire 16-B-300-6381-4881 AWG, UL, CSA	Litze 16-B-300-6381-4881 AWG, UL, CSA	1
5	965624			flat ribbon cable 7-0-220mm	Flachbandkabel 7-0-220mm	1
6	965625			flat ribbon cable 7-0-50mm	Flachbandkabel 7-0-50mm	1
7	965627			flat ribbon cable 12-1-140mm	Flachbandkabel 12-1-140mm	1

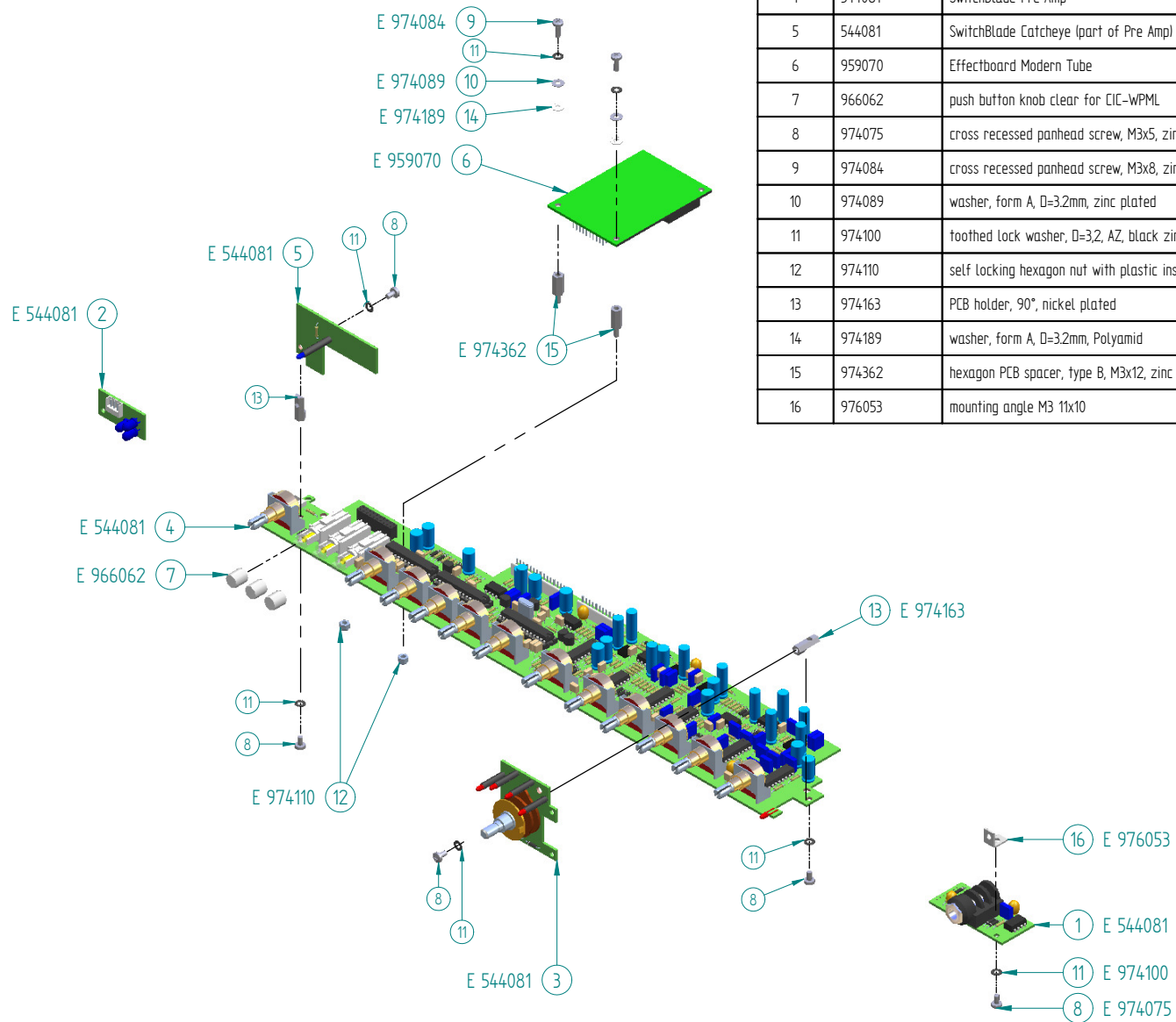
INDEX	CHANGES	RESP.

TITLE
HU1405-SWITCHBLADE HEAD EXPLODED DRAWING CHASSIS

66606 St. Wendel / Germany
Highes & Kutter

DRAWING-NO. HU1405-EX-R03-1A	VERSION 1	REVISION A
DRAWN BY: C. LORIS	DATE 13.07.2006	PAGE 4
CHECKED BY:	DATE	4 PAGES
MATERIAL:	FINISH n/a	
FILENAME: HU1405-EX-R03-1A-Chassis		

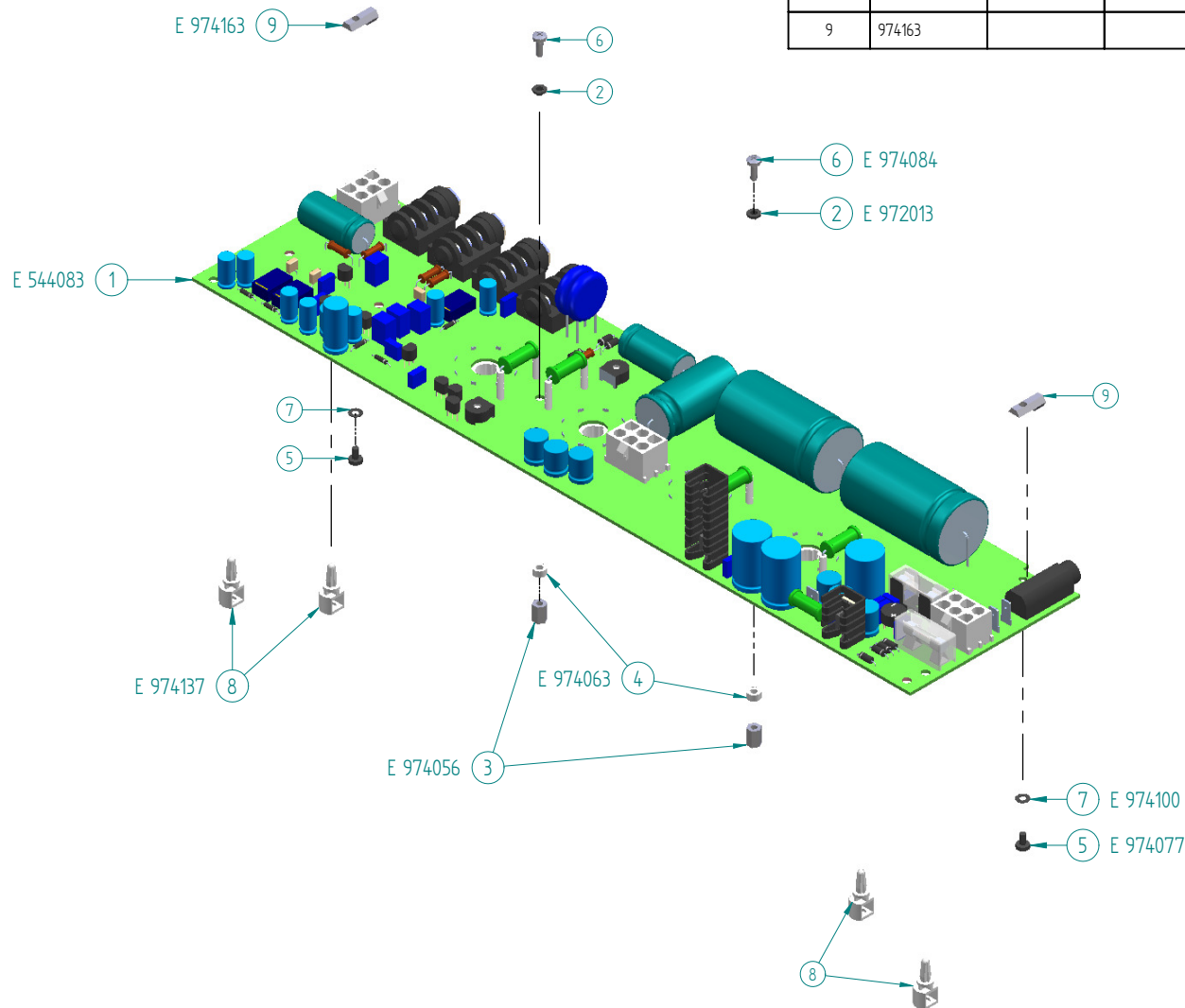
pos.	part-no. 1	description	Beschreibung	quantity
1	544081	SwitchBlade Input board (part of Pre Amp)	SwitchBlade Inputboard (Teil von Pre Amp)	1
2	544081	SwitchBlade Lamp (part of Pre Amp)	SwitchBlade Lamp (Teil von Pre Amp)	1
3	544081	SwitchBlade Switch (part of Pre Amp)	SwitchBlade Switch (Teil von Pre Amp)	1
4	544081	SwitchBlade Pre Amp	SwitchBlade Pre Amp	1
5	544081	SwitchBlade Catcheye (part of Pre Amp)	SwitchBlade Catcheye (Teil von Pre Amp)	1
6	959070	Effectboard Modern Tube	Effectboard Modern Tube	1
7	966062	push button knob clear for CIC-WPML	Knopf-Taster/Schalter transp. f. CIC-WPML Clear	3
8	974075	cross recessed panhead screw, M3x5, zinc plated	Linsenschraube M3x5 vz	5
9	974084	cross recessed panhead screw, M3x8, zinc plated	Linsenschraube M3 x 8 vz	2
10	974089	washer, form A, D=3.2mm, zinc plated	Unterleg-Scheibe 3,2 vz	2
11	974100	toothed lock washer, D=3,2, AZ, black zinc plated	Fa cher-Scheibe az, 3,2 sw vz	7
12	974110	self locking hexagon nut with plastic insert, M3, zinc plated	Stopmutter M3 vz	2
13	974163	PCB holder, 90°, nickel plated	Befestigungselement M3x15 NI	2
14	974189	washer, form A, D=3.2mm, Polyamid	Unterleg-Scheibe 3,2 Kun	2
15	974362	hexagon PCB spacer, type B, M3x12, zinc plated	Dist. Bol Innen/Außengew. M3*12 vz	2
16	976053	mounting angle M3 11x10	Montagewinkel M3 11x10	1



INDEX	CHANGES	RESP.

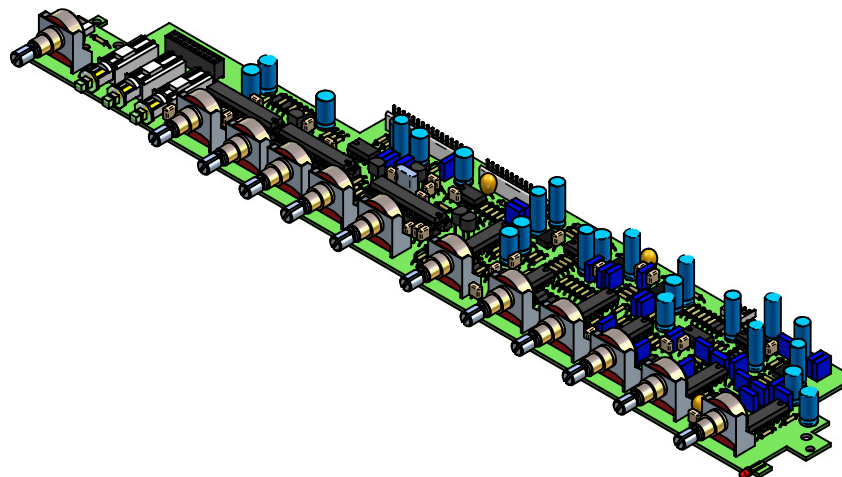
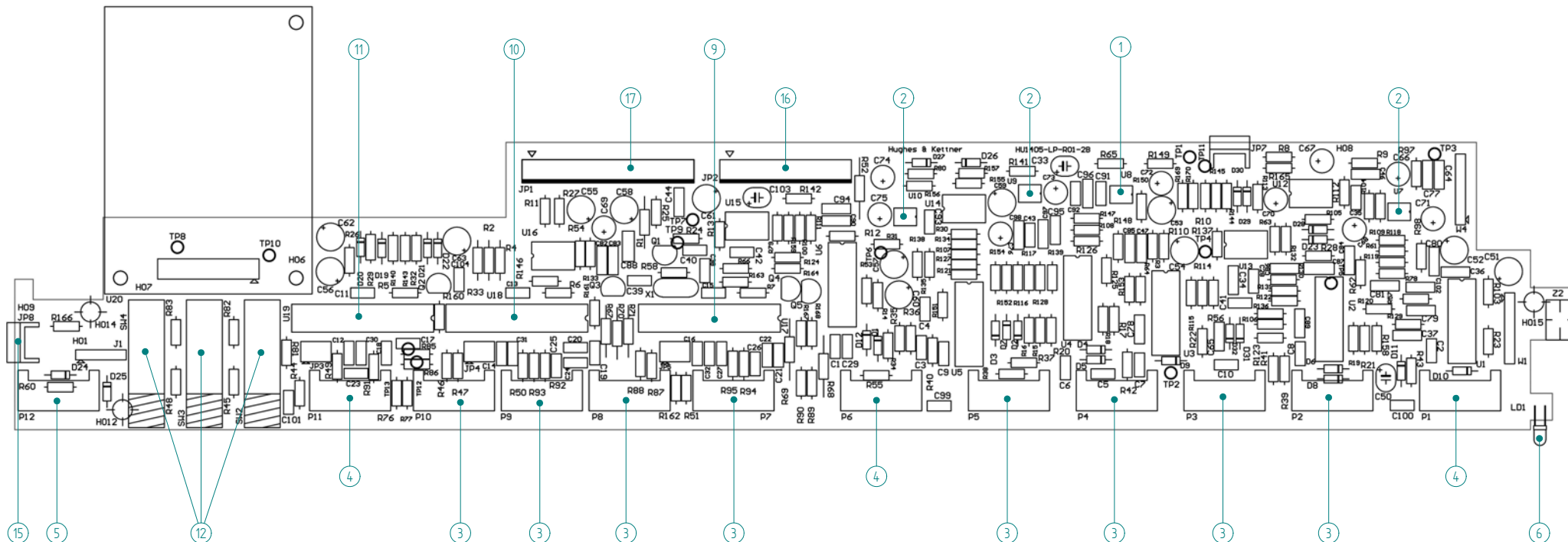
DRAWING-NO.		VERSION	REVISION
HU1405-EX-R04-1A		1	A
DRAWN BY:		DATE	PAGE
C. LORIS		17.07.2006	1
CHECKED BY:		DATE	PAGES
			1
MATERIAL:		FINISH:	
		n/a	
FILENAME:			
HU1405-EX-R04-1A-Preamp-Assy			

pos.	part-no. 1	part-no. 2	part-no. 3	description	Beschreibung	quantity
1	544083			SwitchBlade Power Amp	SwitchBlade Power Amp	1
2	972013			Insulation Sleeve IB6	Insulator Sleeve IB6	2
3	974056			hexagon PCB spacer, M3x8, brass, nickel plated	Dist. Bol 2xlnngew. M3*8 vn	2
4	974063			plastic PCB spacer, 3,2x6x3, Polyamid white	Dist.Hülse PE 3,2*6*3 [mm]	2
5	974077			cross recessed panhead screw, M3x5, black	Linsenschraube M3x5 sw	2
6	974084			cross recessed panhead screw, M3x8, zinc plated	Linsenschraube M3 x 8 vz	2
7	974100			toothed lock washer, D=3,2, AZ, black zinc plated	Fächer-Scheibe az, 3,2 sw vz	2
8	974137			RICHCO, PCB spacer, snap in, H=11mm	Dist.Halter RICHCO H=11,mm	4
9	974163			PCB holder, 90°, nickel plated	Befestigungselement M3x15 NI	2



INDEX	CHANGES	RESP.

DRAWING-NO.		VERSION	REVISION
HU1405-EX-R05-1A		1	A
DRAWN BY:		DATE:	PAGE:
C. LORIS		18.07.2006	1
CHECKED BY:		DATE:	PAGES:
			1
MATERIAL:	FINISH:		
	n/a		
FILENAME:			
HU1405-EX-R05-1A-Poweramp-Assy			



INDEX	CHANGES	RESP.

DRAWING-NO.		VERSION	REVISION
HU1405-LP-R01-2B		1	A
DRAWN BY:		DATE	PAGE
ubaris		11.07.2006	1
CHECKED BY:		DATE	PAGES
			3
MATERIAL:		FINISH:	
		OBERFLÄCHE	
FILENAME:			
HU1405-LP-R01-2B_PREAMP_HEAD			

TITLE
Hughes & Kettner
 SWITCHBLADE HEAD HU1405
 PREAMP

66606 St. Wendel / Germany

Spare Parts List for:


HU1405-LP-R01-2B

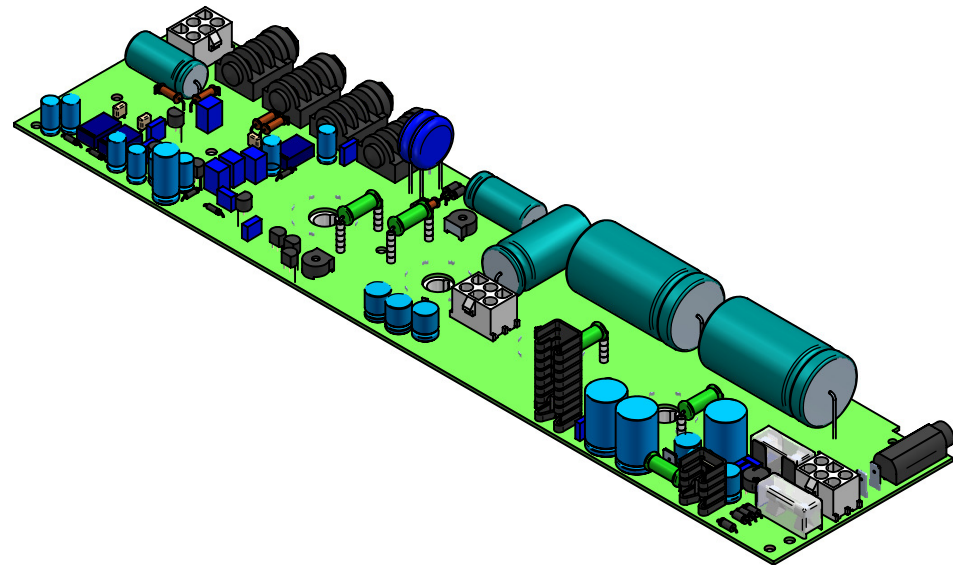
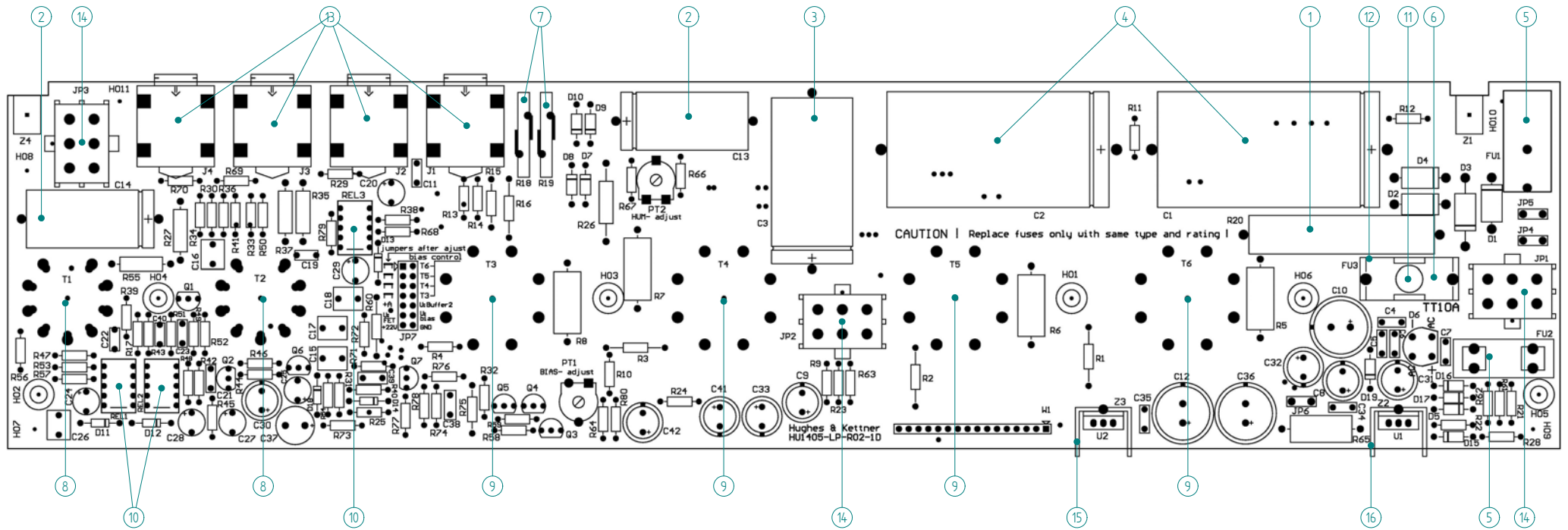
Project: Sw itchblade Head
 Project Number: HU1405
 Assembly: Preamp

pos.	part no.	description	Bezeichnung	reference designators	quantity
1	892001	SMD digital poti 200kOhm	SMD Digital Poti 200kOhm	U8	1
2	892002	SMD digital poti 20kOhm	SMD Digital Poti 20kOhm	U7, U9, U10	3
3	914033	poti B10K lin mono RK16	Poti B10K lin mono RK16	P2, P3, P4, P5, P7, P8, P9, P10	8
4	914033	poti B10K lin mono RK16	Poti B10K lin mono RK16	P11, P1, P6	3
5	914044	poti A250K log mono RK16	Poti A250K log mono RK16	P12	1
6	936003	LED 3mm red standard	LED 3mm rot standard	LD1, LD6, LD7, LD8, LD9	5
7	936017	LED 5mm blue standard diffused	LED 5mm blau standard diffused	LD12, LD13, LD14	3
8	936030	LED 3mm blue standard diffused	LED 3mm blau standard diffused	LD17	1
9	942074	8 Bit AVR-RISC MC, programmed (Master10)	8 Bit AVR-RISC MC, programmiert (Master10)	U17	1
10	942074	8 Bit AVR-RISC MC, programmed (Slave1-10)	8 Bit AVR-RISC MC, programmiert (Slave1-10)	U18	1
11	942074	8 Bit AVR-RISC MC, programmed (Slave2-10)	8 Bit AVR-RISC MC, programmiert (Slave2-10)	U19	1
12	950053	push button CIC WPML-2BL-NL	Drucktaster CIC WPML-2BL-NL	SW2, SW3, SW4	3
13	950068	sw itch 3x4xUM vertical	DrehSchalter 3x4xUM vertikal	SW1	1
14	952038	jack Rean NMJ 4 HCD 2	Klinkenbuchse Rean NMJ 4 HCD 2	J2	1
15	952052	header, JST, 3pol horizontal	Stiftleiste JST 3pol Wprint	JP8, JP9	2
16	952065	header, AMP, 12pol, vertical	Stiftleiste 12pol Gprint	JP2	1
17	952071	header, AMP, 16pol, vertical	Stiftleiste 16pol Gprint	JP1	1

pushbutton cab not included

INDEX	CHANGES	RESP.

 66606 St. Wendel / Germany		TITLE: SWITCHBLADE HEAD HU1405 PREAMP	
		DRAWING-NO. HU1405-LP-R01-2B	VERSION 1
DRAWN BY: ubaris	DATE: 11.07.2006	PAGE: 3	
CHECKED BY:	DATE:	3 PAGES	
MATERIAL:	FINISH: OBERFLÄCHE		
FILENAME: HU1405-LP-R01-2B_PREAMP_HEAD			



INDEX	CHANGES	RESP.

		TITLE SWITCHBLADE HEAD HUI405 POWERAMP	
		66606 St. Wendel / Germany	
DRAWING-NO.	HUI405-LP-R02-1D	VERSION	1
DRAWN BY:	ubaris	DATE:	17.07.2006
CHECKED BY:		DATE:	
MATERIAL:		FINISH:	OBERFLÄCHE
FILENAME:	HUI405-LP-R02-1D_POWERAMP_HEAD		
		REVISION	A
		PAGE:	1
		PAGES:	2

Spare Parts List for:


HU1405-LP-R02-1D

Project:
Project Number:
Assembly:

Switchblade Head
HU1405
Poweramp

pos.	part no.	description	Bezeichnung	reference designators	quantity
1	911129	resistor axial 680 Ohm 11W	Drahtw id. axial 680 Ohm 11W	R20	1
2	926006	electrolytic capacitor axial 15µF 450V	Elko axial 15µF 450V	C13, C14	2
3	926014	electrolytic capacitor axial 33µF 500V	Elko axial 33µF 500V	C3	1
4	926016	electrolytic capacitor axial 220µF 350V	Elko axial 220µF 350V	C2, C1	2
5	932028	microfuse 630mA time-lag	Feinsicherung 630mA Träge	FU1, FU2	2
6	932071	microfuse 10,0A super-time-lag	Feinsicherung 10,0A Superträge	FU3	1
7	932084	varistor SIOV-S20K50 50V	Varistor SIOV-S20K50 50V	R19, R18	2
8	944003	tubesocket 9pol PC-Mont.	Röhrensocket 9pol PC-Mont.	T1, T2	2
9	944004	tubesocket 8pol Print-Mont.	Röhrensocket 8pol Print-Mont.	T3, T4, T5, T6	4
10	946011	relais NAIS TQ2-24V DC print	Relais NAIS TQ2-24V DC print	REL1, REL2, REL3	3
11	948008	fuse holder print Typ OGN	SI-Halter print Typ OGN	FU3	1
12	948033	fuse cover Typ OGN	Abdeckhaube Si-Halter Typ OGN	FU3	1
13	952038	jack Rean NMJ 4 HCD 2	Klinkenbuchse Rean NMJ 4 HCD 2	J4, J3, J2, J1	4
14	952303	plug connector MATE-N-LOK vert	Steckverbinder MATE-N-LOK vert	JP3, JP2, JP1	3
15	968009	heatsink FK 240 SA 220 VL	Kühlk. FK 240 SA 220 VL	Z3	1
16	968010	heatsink FK 237 SA 220 VL	Kühlk. FK 237 SA 220 VL	Z2	1

INDEX	CHANGES	RESP.

 66606 St. Wendel / Germany		TITLE	
		SWITCHBLADE HEAD HU1405 POWERAMP	
DRAWING-NO.	HU1405-LP-R02-1D	VERSION	1
DRAWN BY:	ubaris	DATE	17.07.2006
CHECKED BY:		DATE	
		2 PAGES	
MATERIAL:		FINISH:	OBERFLÄCHE
FILENAME:		HU1405-LP-R02-1D_POWERAMP_HEAD	

Spare Parts List for:

HU1405-LP-R03-1C

Project:

Sw itchblade Head

Project Number:

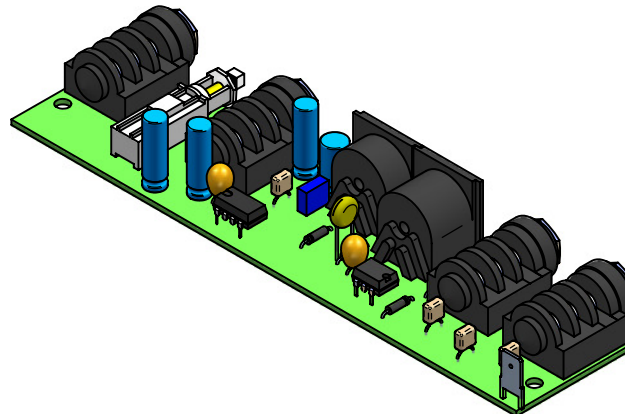
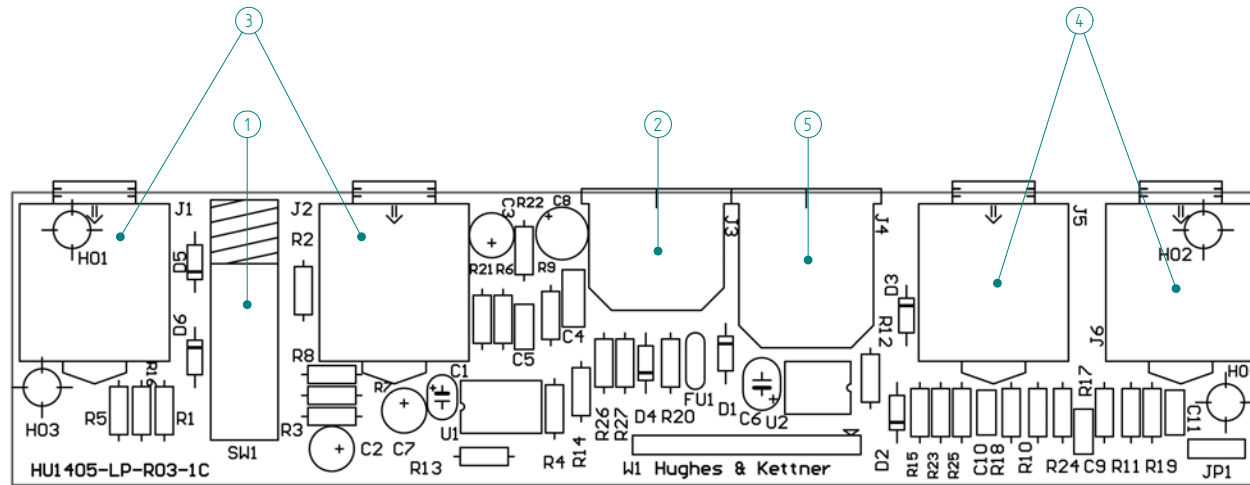
HU1405

Assembly:

FX-Board

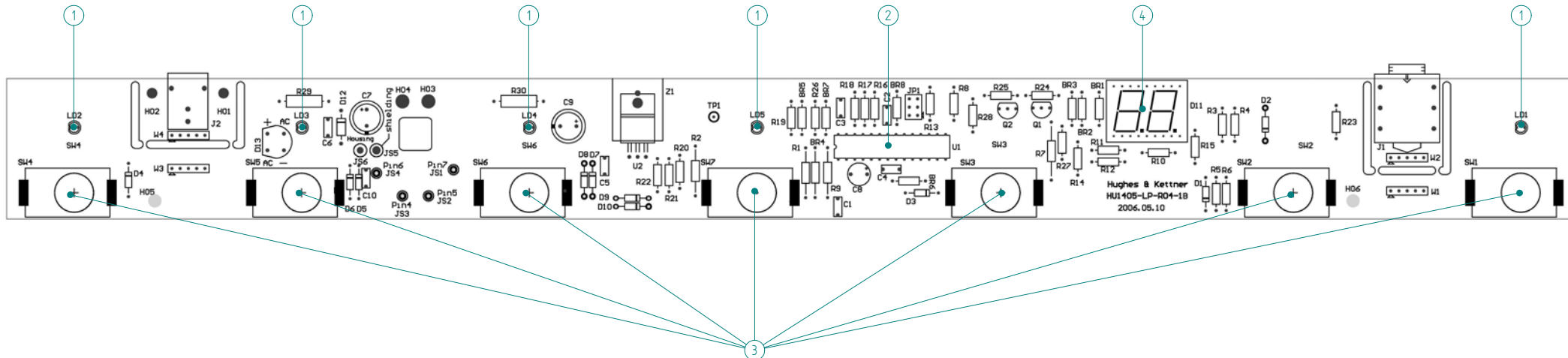
pos.	part no.	description	Beschreibung	reference designators	quantity
1	950048	push button CIC WPML-2Y-SL	Drucktaster CIC WPML-2Y-SL	SW1	1
2	952012	diode jack MAB 5 SH Wprint	Diodenbuchse MAB 5 SH Wprint	J3	1
3	952038	jack Rean NMJ 4 HCD 2	Klinkenbuchse Rean NMJ 4 HCD 2	J2, J1	2
4	952041	jack Rean NMJ 6 HCD 2	Klinkenbuchse Rean NMJ 6 HCD 2	J6, J5	2
5	952138	diode jack MAB 7 SH-L Wprint	Diodenbuchse MAB 7 SH-L Wprint	J4	1

Sw itchcab not included (see page xx)



INDEX	CHANGES	RESP.

DRAWING-NO.		VERSION	REVISION
HU1405-R03-1C		1	A
DRAWN BY:		DATE:	PAGE:
ubaris		17.07.2006	1
CHECKED BY:		DATE:	PAGES:
			1
MATERIAL:		FINISH:	
		OBERFLÄCHE	
FILENAME:			
HU1405-LP-R03-1C_FXBOARD			



Spare Parts List for:

HU1405-LP-R04-1B

Project:
Project Number:
Assembly:

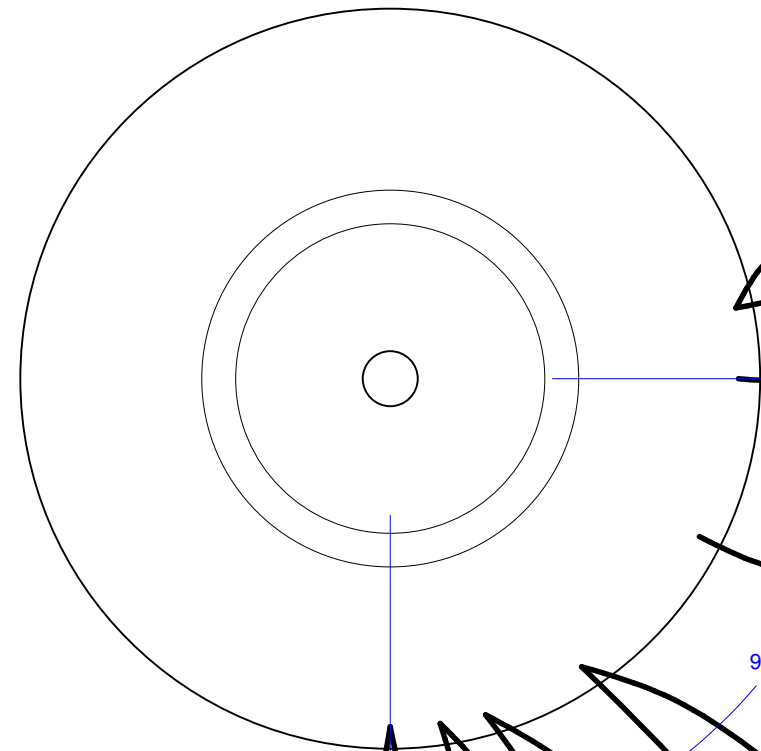
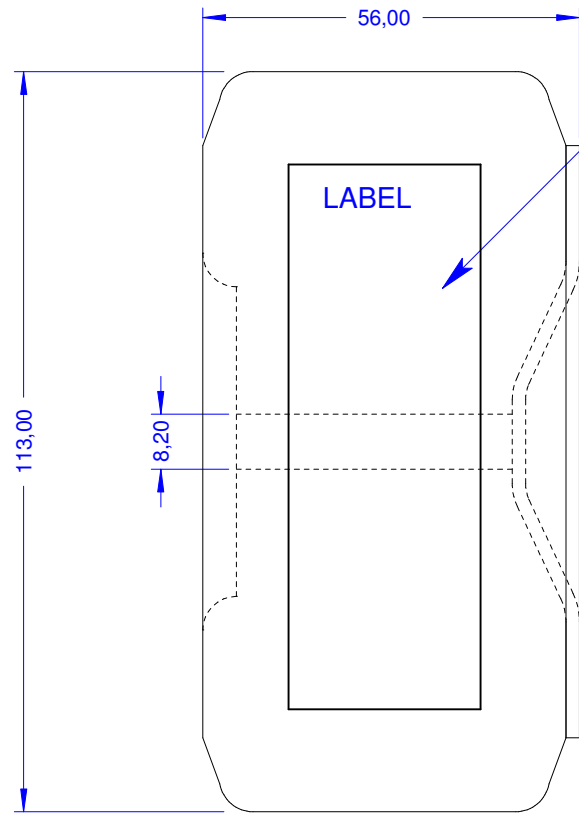
Sw itchblade Head
HU1405
Footsw itch FSM432

pos.	part no.	description	Bezeichnung	reference designators	quantity
1	936003	LED 3mm red standard diffused	LED 3mm rot Standard diffused	LD5, LD4, LD3, LD2, LD1	5
2	942074	IC ATmega8L-8PU MC for FSM-432	IC ATmega 8L-8PU MC für FSM-432	U1	1
3	C90174	pushbutton 1pol. for FSM-432	Taster 1pol.für FSM-432	SW7, SW6, SW5, SW4, SW3, SW2, SW1	7
4	C90175	dual digit numeric LED-display for FSM-432	LED-Display 2-stellig für FSM-432	D11	1

INDEX	CHANGES	RESP.

		TITLE Switchblade HU1405 FSM432 Footswitch	
		66606 St. Wendel / Germany	
DRAWING-NO.		VERSION	REVISION
HU1405-LP-R04-1B		1	A
DRAWN BY:		DATE	PAGE
ubaris		20.07.2006	1
CHECKED BY:		DATE	PAGES
			1 PAGES
MATERIAL:		FINISH:	
Fehler: Keine Referenz		OBERFLÄCHE	
FILENAME:			
HU1405-LP-R04-1B_FSM432_Switchboard			

In and output terminals have to be marked with secondary and primary and a connection identification!



230/245V (245V)
Color: White
Faston: 6,3X0,8 insulates
Length: 250mm

230/245V (230V)
Color: Blue
Faston: 6,3X0,8 insulates
Length: 250mm

230/245V (0V)
Color: Brown
Faston: 4,8X0,8 insulates
Length: 200mm

Shield winding GND
Color: Yello/Green
Faston: 6,3X0,8
Length: 250mm

Primary

Secondary

340V (340V)
Color: Red
Faston: 4,8X0,8
Length: 200mm

340V (0)
Color: Orange
Faston: 4,8X0,8
Length: 200mm

52V (52V), Yello, 180mm, Pin 3

52V (0V), Blue, 180mm, Pin 6

17V (17V), Violet, 180mm, Pin 2

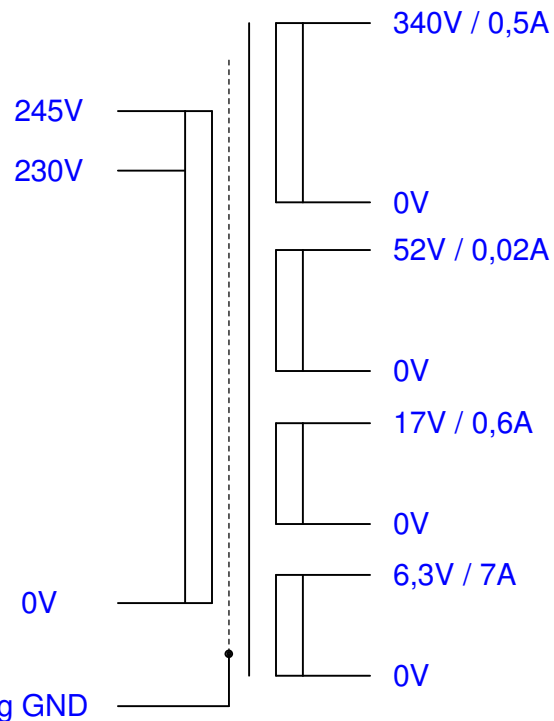
17V (0V), Green, 180mm, Pin 5

6,3V (6,3V), Gray, 180mm, Pin 1

6,3V (0V), White, 180mm, Pin 4

AMP,
Universal Mate-N-Lok, 6pol.
Case: 0-350715-1


Power: 226VA



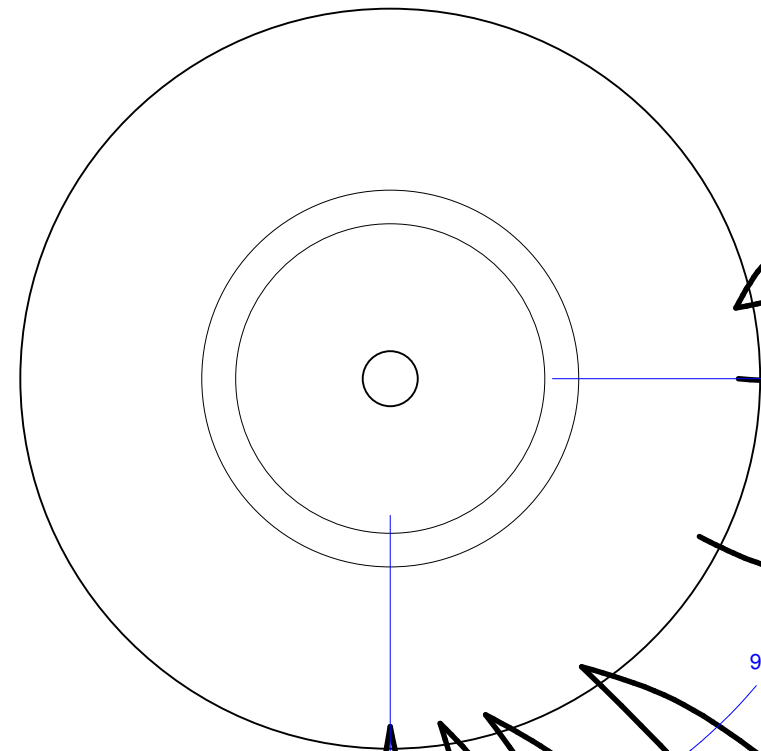
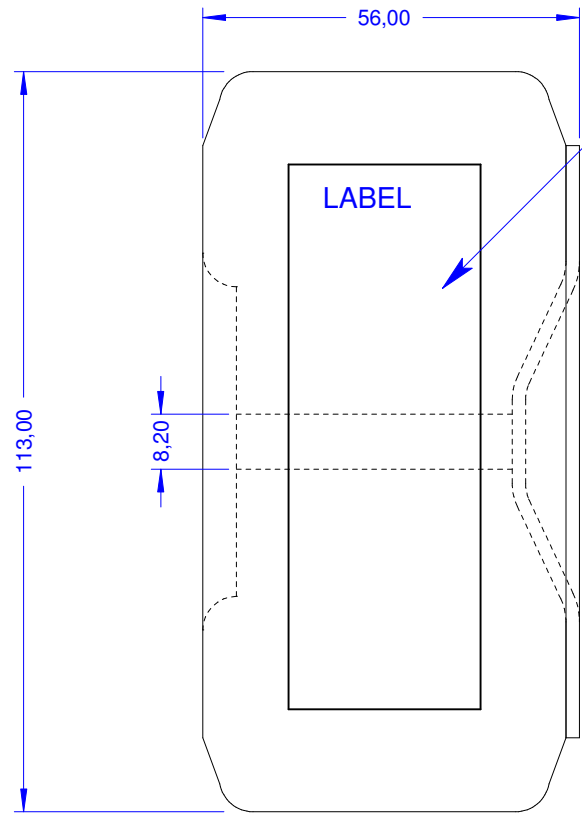
Secondary

Starting from the version "HU1405-TR-R01-1C" got additionally a copper screen whereby the magnetic stray field decreases !

Declaration that an isolationsystem according to UL508 is used and that all used materials are UL-listed and according to the thermal class declared for the transformer. The transformers have to be marked with the UL sign, manufacturers name or trademark !

		Titel: Switchblade 100 Head Mains transformer 230V / 245V	
Zeichnungsnummer: HU1405-TR-R01-1C		Version: 1	Revision: C
Erstellt von: Bernd Schneider	am: 27.05.2008	Blatt 1	
Geprüft / freigegeben von: Bernd Schneider	am: 27.05.2008	1 Blätter	
Werkstoff: -----		Oberfläche: -----	
Dateiname: HU1405-TR-R01-1C_mains-transformer_230-245			

In and output terminals have to be marked with secondary and primary and a connection identification!



100/117V (117V)
Color: White
Faston: 6,3X0,8 insulates
Length: 250mm

100/117V (100V)
Color: Blue
Faston: 6,3X0,8 insulates
Length: 250mm

100/117V (0V)
Color: Brown
Faston: 4,8X0,8 insulates
Length: 200mm

Shield winding GND
Color: Yello/Green
Faston: 6,3X0,8
Length: 250mm

Primary

Secondary

340V (340V)
Color: Red
Faston: 4,8X0,8
Length: 200mm

340V (0)
Color: Orange
Faston: 4,8X0,8
Length: 200mm

52V (52V), Yello, 180mm, Pin 3

52V (0V), Blue, 180mm, Pin 6

17V (17V), Violet, 180mm, Pin 2

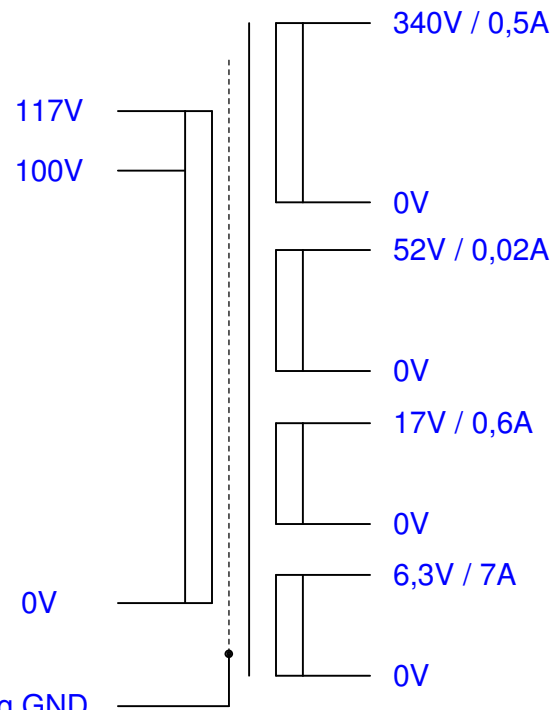
17V (0V), Green, 180mm, Pin 5

6,3V (6,3V), Gray, 180mm, Pin 1

6,3V (0V), White, 180mm, Pin 4

AMP,
Universal Mate-N-Lok, 6pol.
Case: 0-350715-1

Power: 226VA



Starting from the version "HU1605-TR-R03-1C" got additionally a copper screen whereby the magnetic stray field decreases!

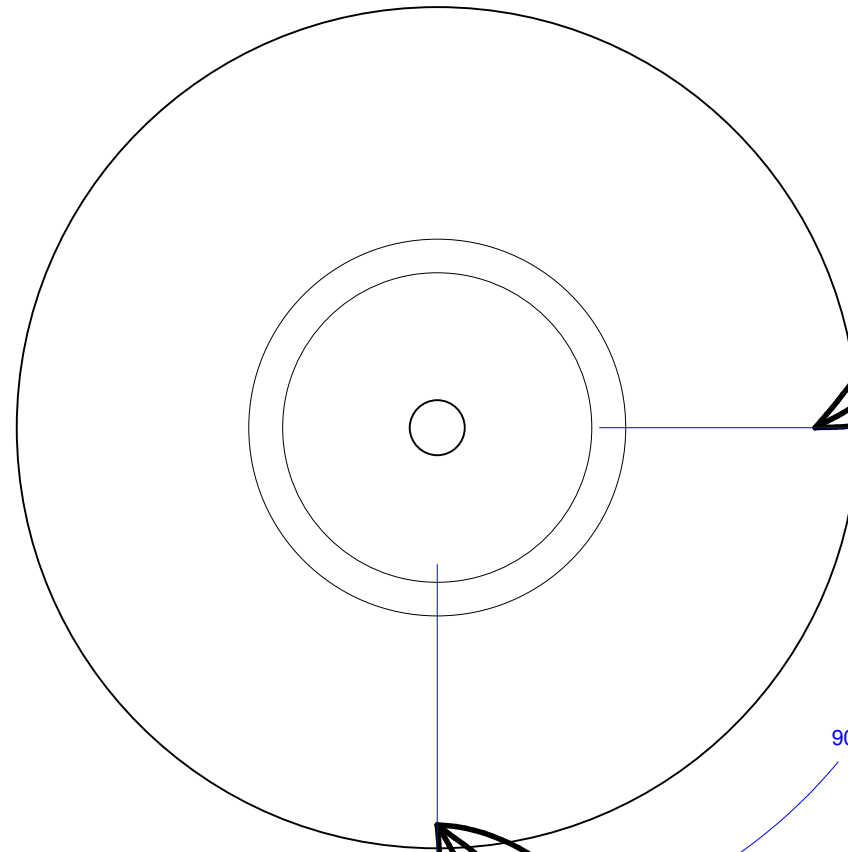
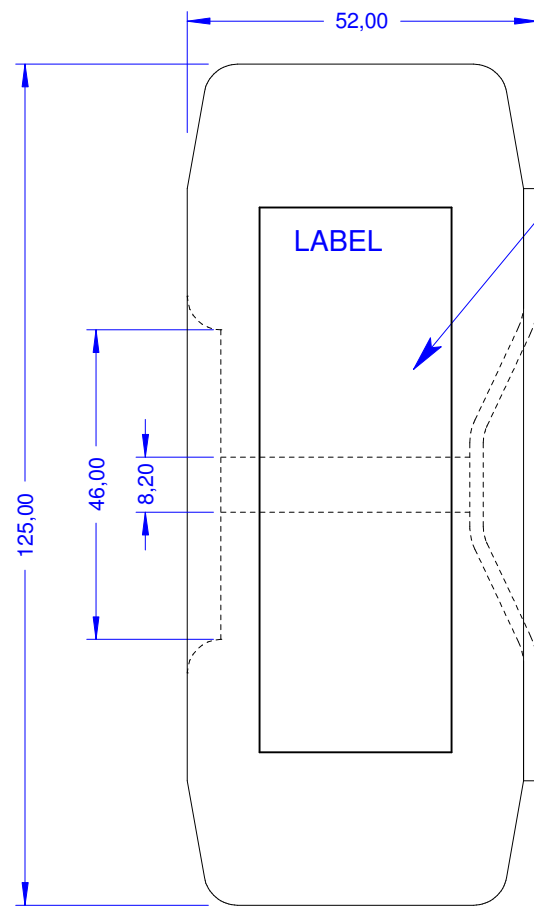
Declaration that an isolationsystem according to UL508 is used and that all used materials are UL-listed and according to the thermal class declared for the transformer. The transformers have to be marked with the UL sign, manufacturers name or trademark !

		Titel: Switchblade Head Mains transformer 100V / 117V	
Zeichnungsnummer: HU1405-TR-R03-1C		Version: 1	Revision: C
Erstellt von: Bernd Schneider	am: 27.05.2008	Blatt 1	
Geprüft / freigegeben von: Bernd Schneider	am: 27.05.2008	1 Blätter	
Werkstoff: -----		Oberfläche: -----	
Dateiname: HU1405-TR-R03-1C_mains-transformer_100-117			

In and output terminals have to be marked with secondary and primary and a connection identification!

Starting from the version "HU1405-TR-R02-1C" the isolation system was improved in relation to earlier models !

Details:
1x50% insulation layer between the 3rd and 4th layers of windings of both the primaries.



Anode1 (P1), Blue, 350mm, Pin 6

+A (CT), Violet, 350mm, Pin 2

Anode2 (P2), Orange, 350mm, Pin 4

AMP,
Universal Mate-N-Lok, 6pol.
Case: 0-350715-1

Primary

Secondary

Audio- Power: 100RMS

Anode 2 (P2)
Danger! :
peak voltage= 4000V

16 OHM

8 OHM

4 OHM

0 OHM

Primary

+A 470V
(CT)

Secondary

Anode 1 (P1)
Danger! :
peak voltage= 4000V

4 OHM, Black, 180mm, Pin 6


0 OHM, Red, 180mm, Pin 2

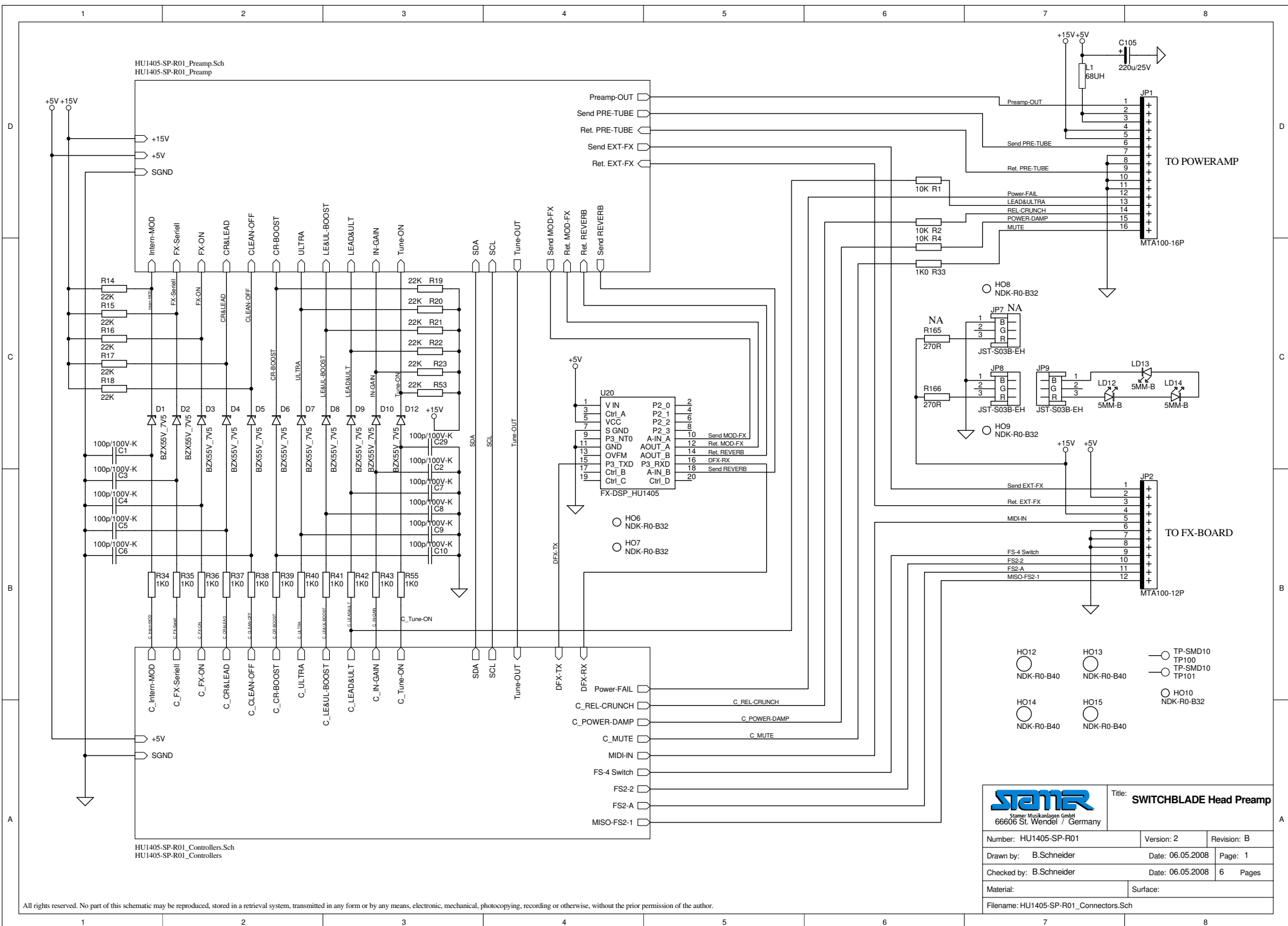
8 OHM, Green, 180mm, Pin 5

16OHM, Brown, 180mm, Pin 4

AMP,
Universal Mate-N-Lok, 6pol.
Case: 0-350715-1

Declaration that an isolation system according to UL508 is used and that all used materials are UL-listed and according to the thermal class declared for the transformer. The transformers have to be marked with the UL sign, manufacturers name or trademark !

 Stamer Musikanlagen GmbH 66606 St. Wendel / Germany		Titel: Switchblade 100 Head Audio transformer	
Zeichnungsnummer: HU1405-TR-R02-1C		Version: 1	Revision: C
Erstellt von: Bernd Schneider	am: 27.05.2008	Blatt 1	
Geprüft / freigegeben von: Bernd Schneider	am: 27.05.2008	1 Blätter	
Werkstoff: -----		Oberfläche: -----	
Dateiname: HU1405-TR-R01-1C_audio-transformer			



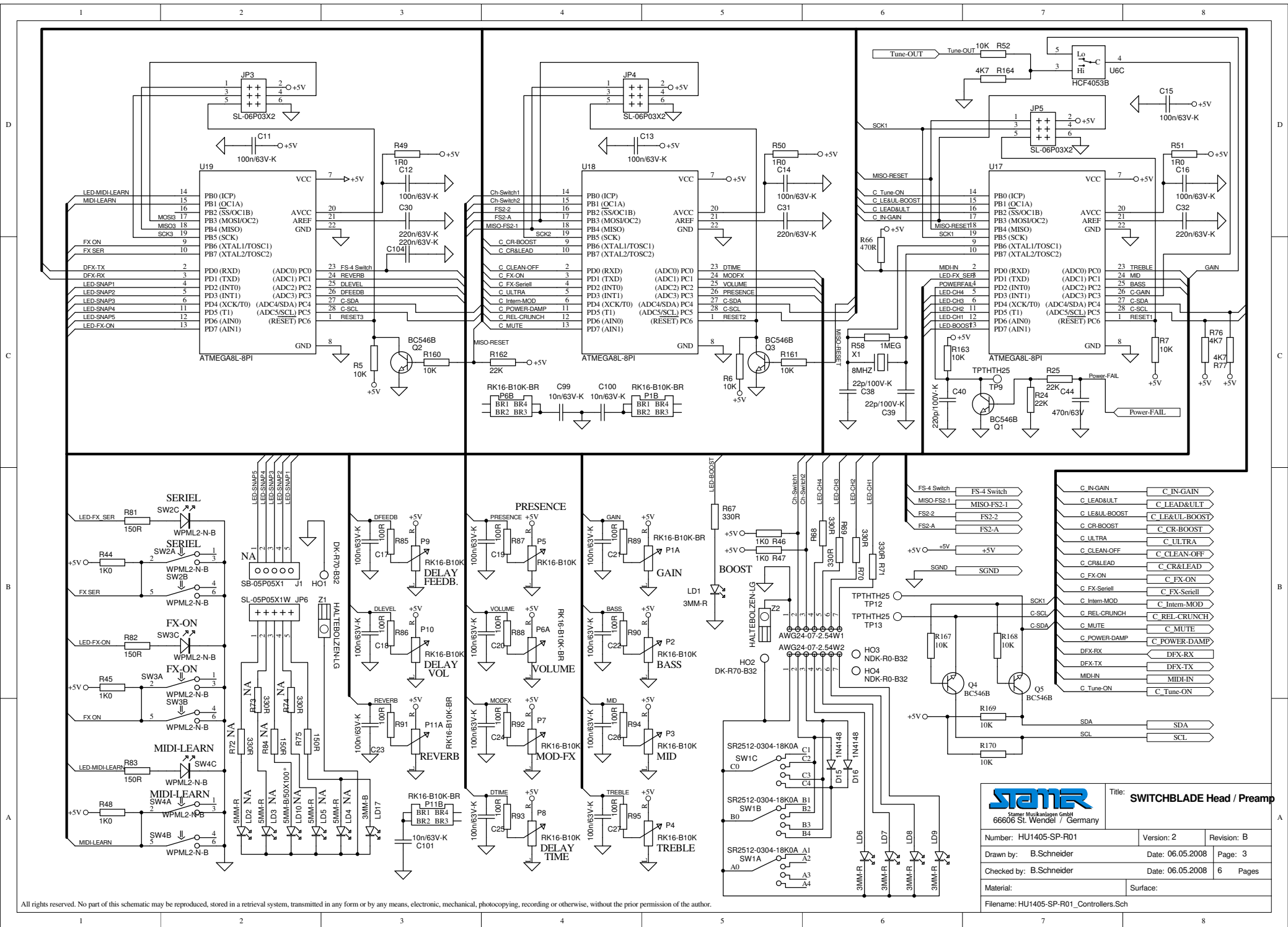
HU1405-SP-R01_Preamplifier
HU1405-SP-R01_Preamplifier

HU1405-SP-R01_Controllers.Sch
HU1405-SP-R01_Controllers


STANER Title: SWITCHBLADE Head Preamp
 Stamer Musikanlagen GmbH
 66606 St. Wendel / Germany

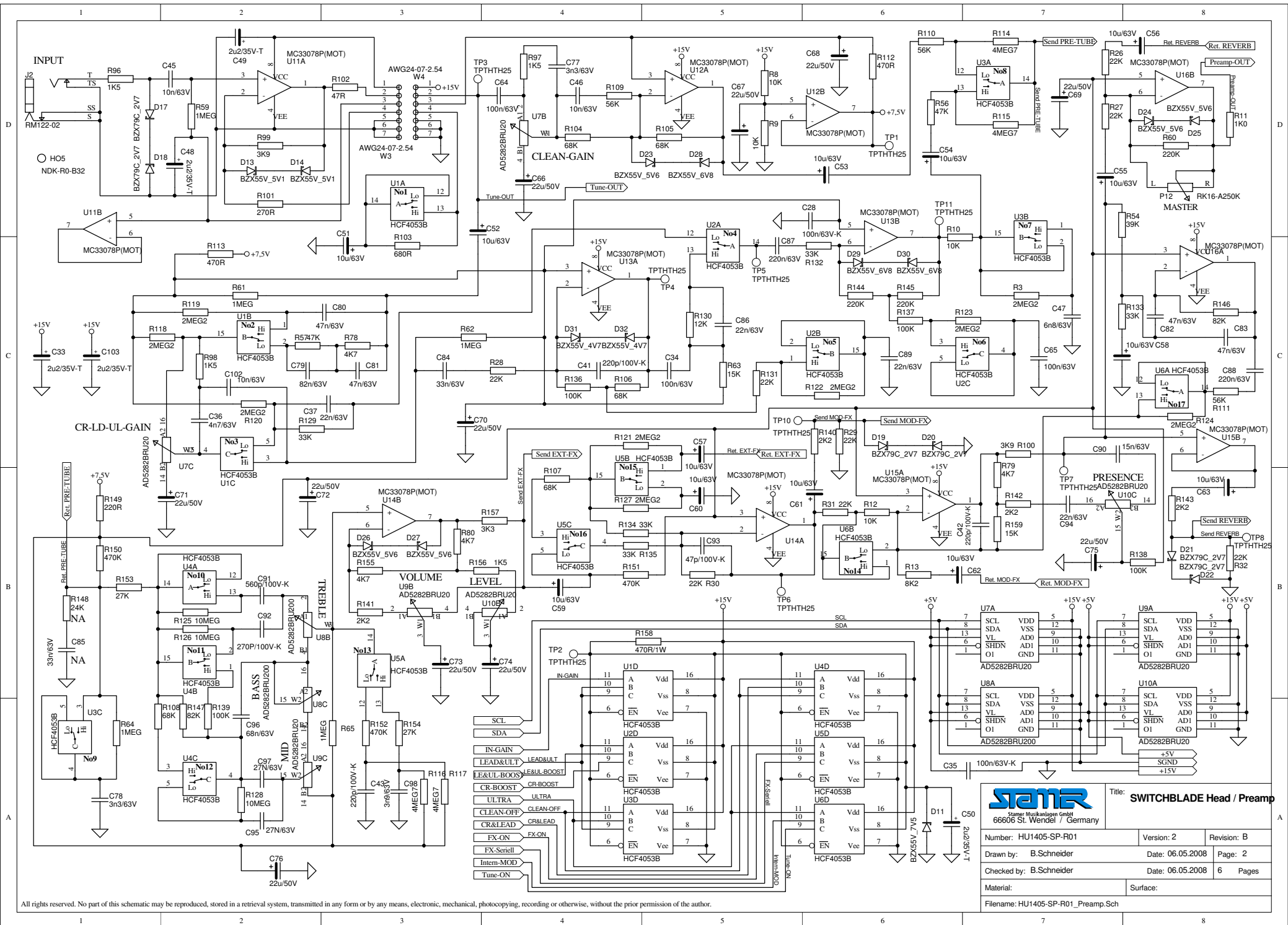
Number: HU1405-SP-R01	Version: 2	Revision: B
Drawn by: B.Schneider	Date: 06.05.2008	Page: 1
Checked by: B.Schneider	Date: 06.05.2008	6 Pages
Material:	Surface:	
Filename: HU1405-SP-R01_Connectors.Sch		

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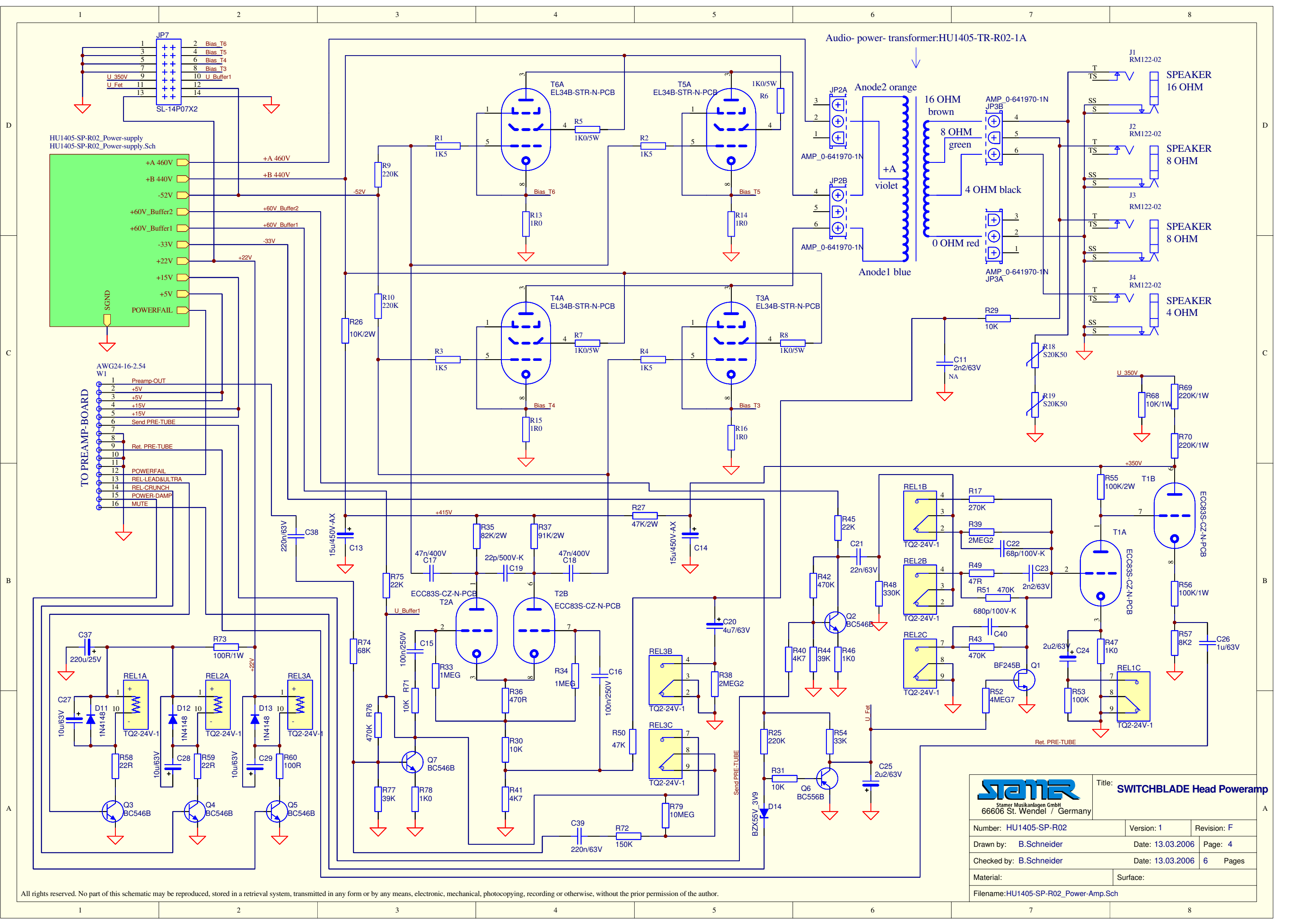
		Title: SWITCHBLADE Head / Preamp	
		Stamer Musikanlagen GmbH 66606 St. Wendel / Germany	
Number: HU1405-SP-R01	Version: 2	Revision: B	
Drawn by: B.Schneider	Date: 06.05.2008	Page: 3	
Checked by: B.Schneider	Date: 06.05.2008	6 Pages	
Material:	Surface:		
Filename: HU1405-SP-R01_Controllers.Sch			




STANER Title: SWITCHBLADE Head / Preamp
 66606 St. Wendel / Germany

Number: HU1405-SP-R01	Version: 2	Revision: B
Drawn by: B.Schneider	Date: 06.05.2008	Page: 2
Checked by: B.Schneider	Date: 06.05.2008	6 Pages
Material:	Surface:	
Filename: HU1405-SP-R01_Preamplifier		

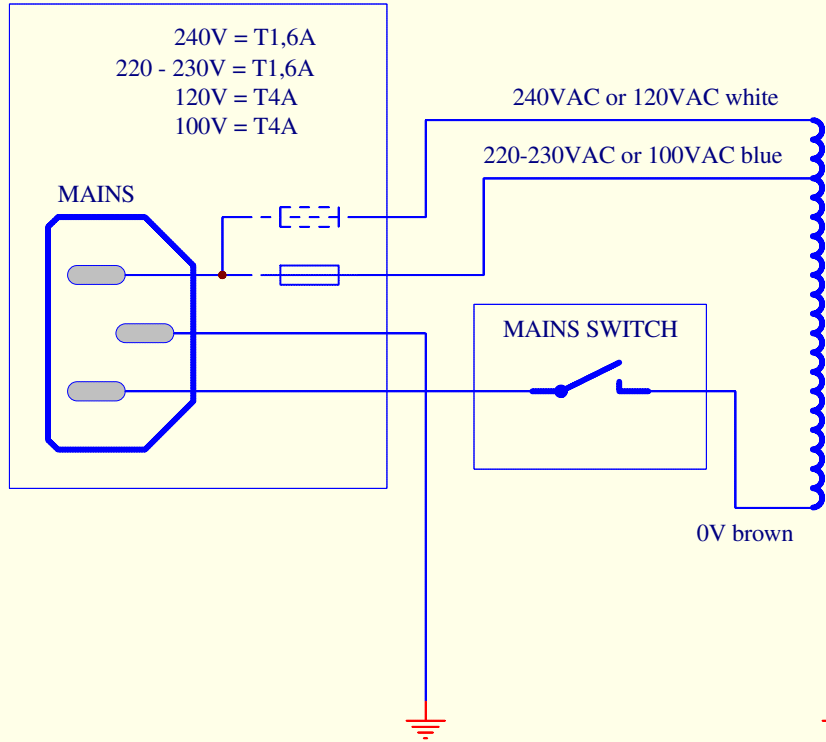
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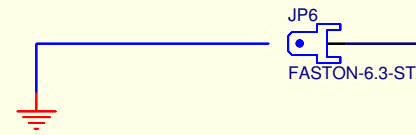
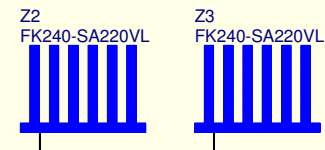
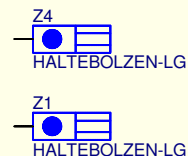
		Title: SWITCHBLADE Head Poweramp	
		Stamer Musikanlagen GmbH 66606 St. Wendel / Germany	
Number: HU1405-SP-R02	Version: 1	Revision: F	
Drawn by: B.Schneider	Date: 13.03.2006	Page: 4	
Checked by: B.Schneider	Date: 13.03.2006	6 Pages	
Material:	Surface:		
Filename: HU1405-SP-R02_Power-Amp.Sch			

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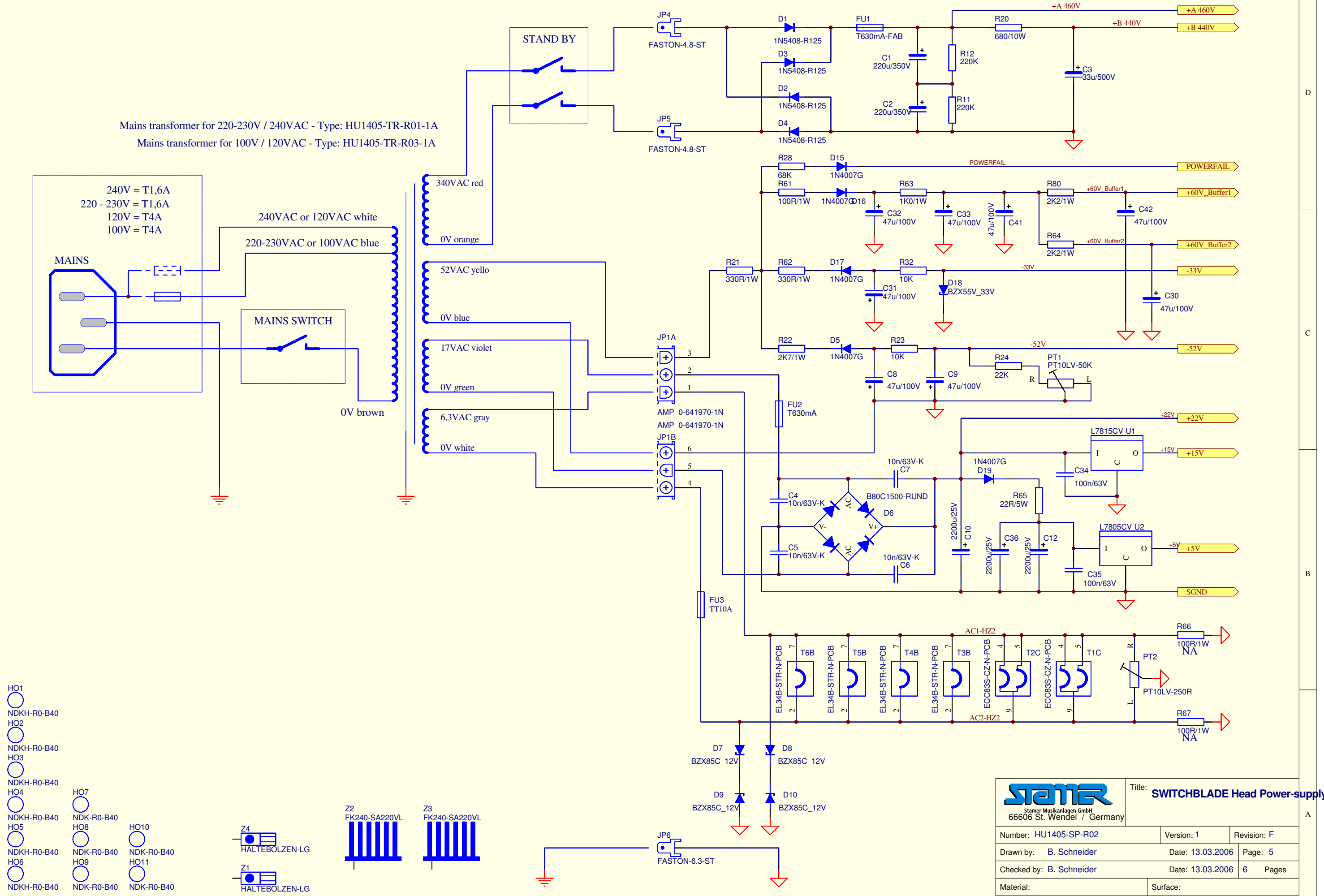
Mains transformer for 220-230V / 240VAC - Type: HU1405-TR-R01-1A
 Mains transformer for 100V / 120VAC - Type: HU1405-TR-R03-1A

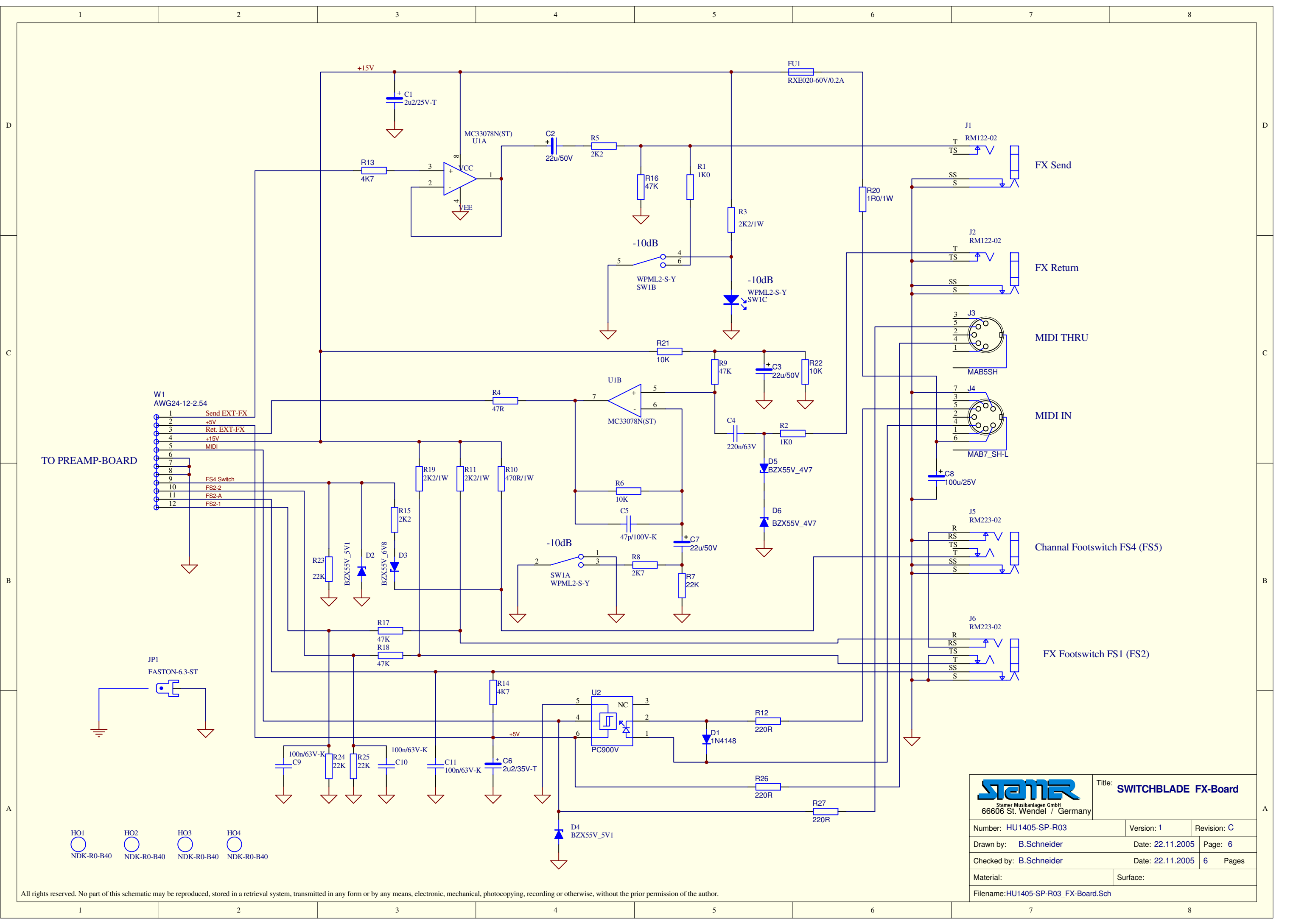


- HO1
- NDKH-R0-B40
- HO2
- NDKH-R0-B40
- HO3
- NDKH-R0-B40
- HO4
- NDKH-R0-B40
- HO5
- NDKH-R0-B40
- HO6
- NDKH-R0-B40
- HO7
- NDK-R0-B40
- HO8
- NDK-R0-B40
- HO9
- NDK-R0-B40
- HO10
- NDK-R0-B40
- HO11
- NDK-R0-B40



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TO PREAMP-BOARD

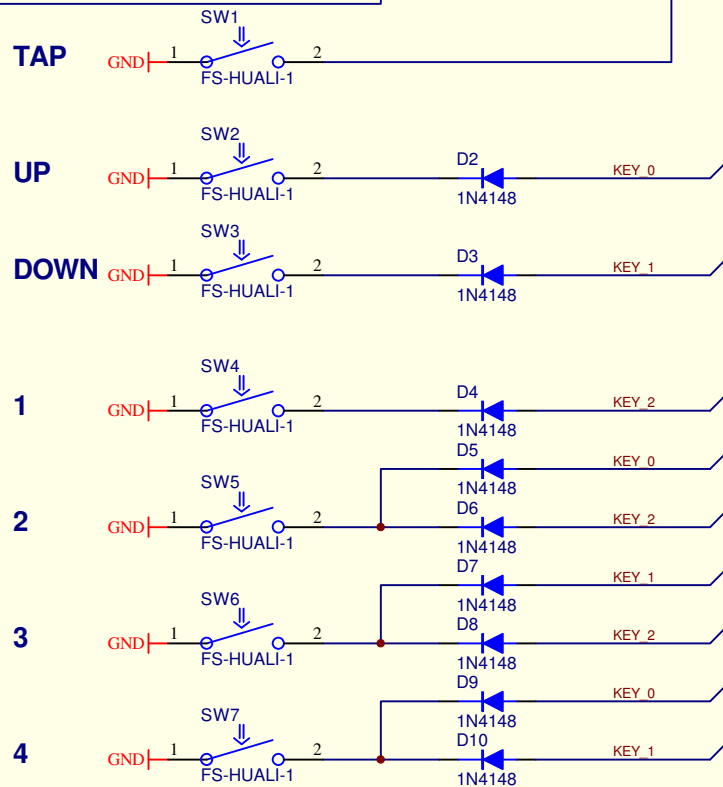
- W1
AWG24-12-2.54
- 1 Send EXT-FX
 - 2 +5V
 - 3 Ret. EXT-FX
 - 4 +15V
 - 5 MIDI
 - 6
 - 7
 - 8
 - 9 FS4 Switch
 - 10 FS2-2
 - 11 FS2-A
 - 12 FS2-1

- HO1 NDK-R0-B40
- HO2 NDK-R0-B40
- HO3 NDK-R0-B40
- HO4 NDK-R0-B40

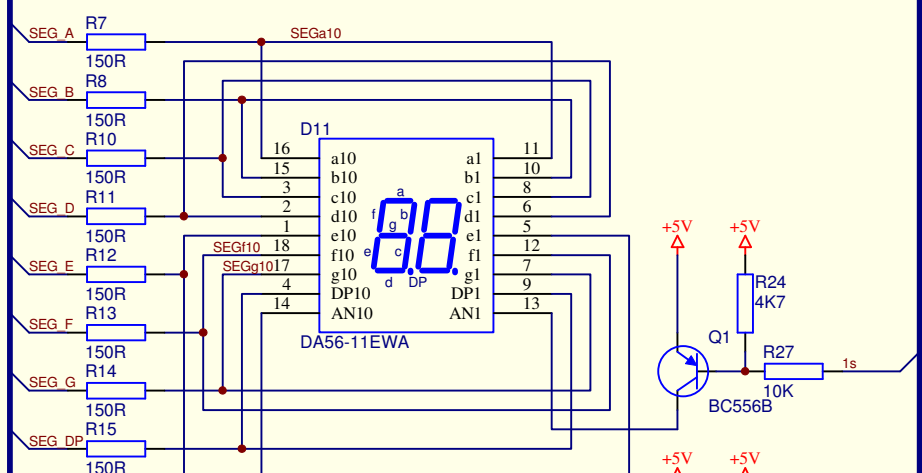
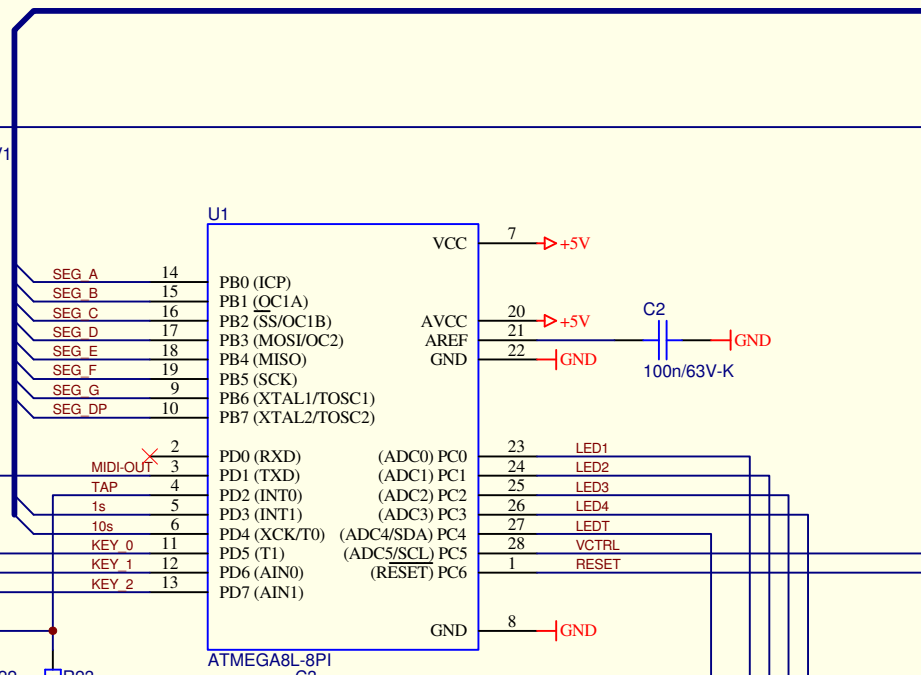
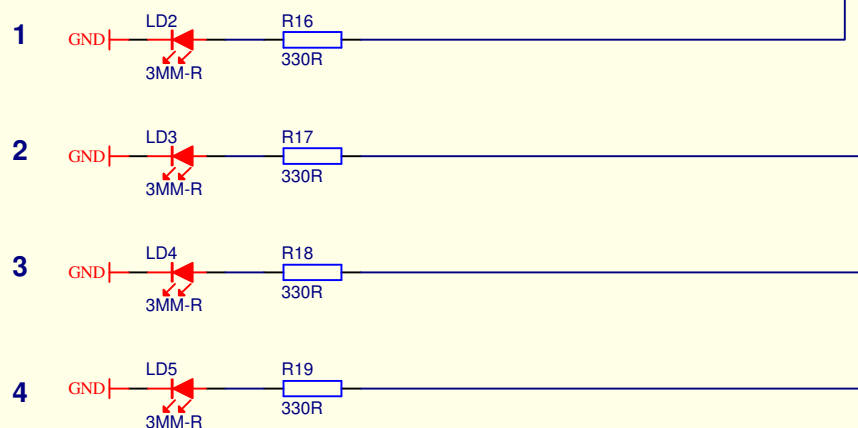
STAMER Stamer Musikanlagen GmbH 66606 St. Wendel / Germany		Title: SWITCHBLADE FX-Board	
Number: HU1405-SP-R03	Version: 1	Revision: C	
Drawn by: B.Schneider	Date: 22.11.2005	Page: 6	
Checked by: B.Schneider	Date: 22.11.2005	6 Pages	
Material:	Surface:		
Filename: HU1405-SP-R03_FX-Board.Sch			

CTRL IN

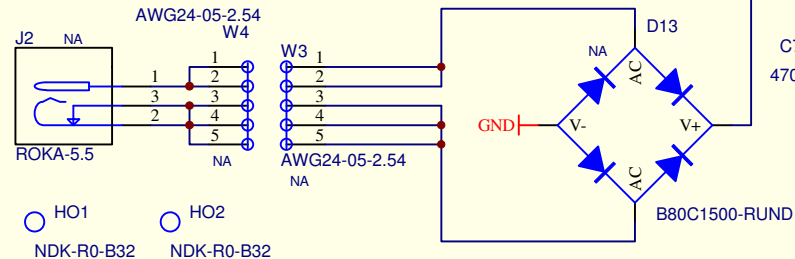
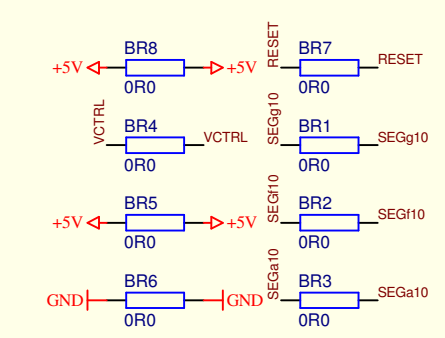
MIDI OUT



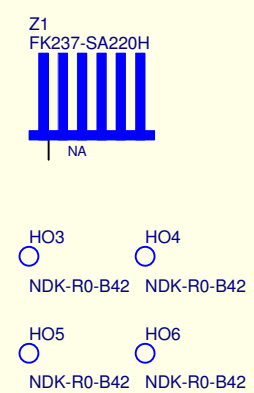
TAP LED



ISP

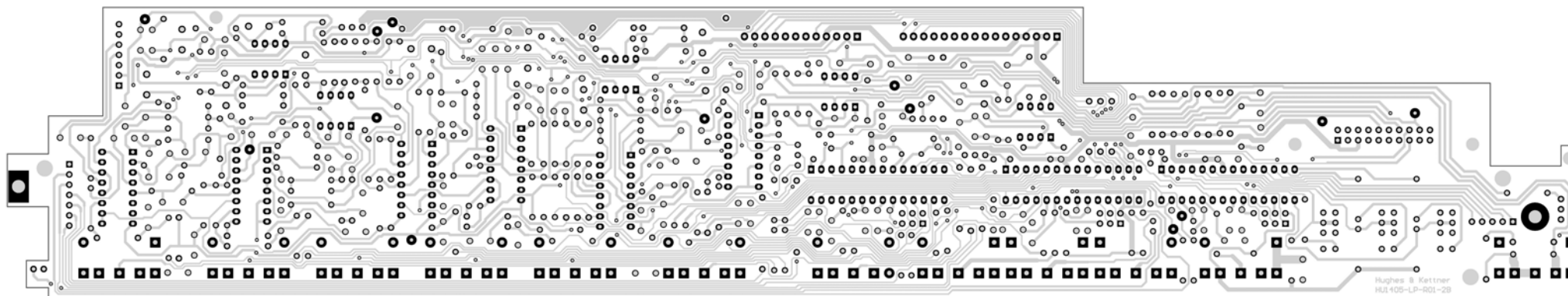
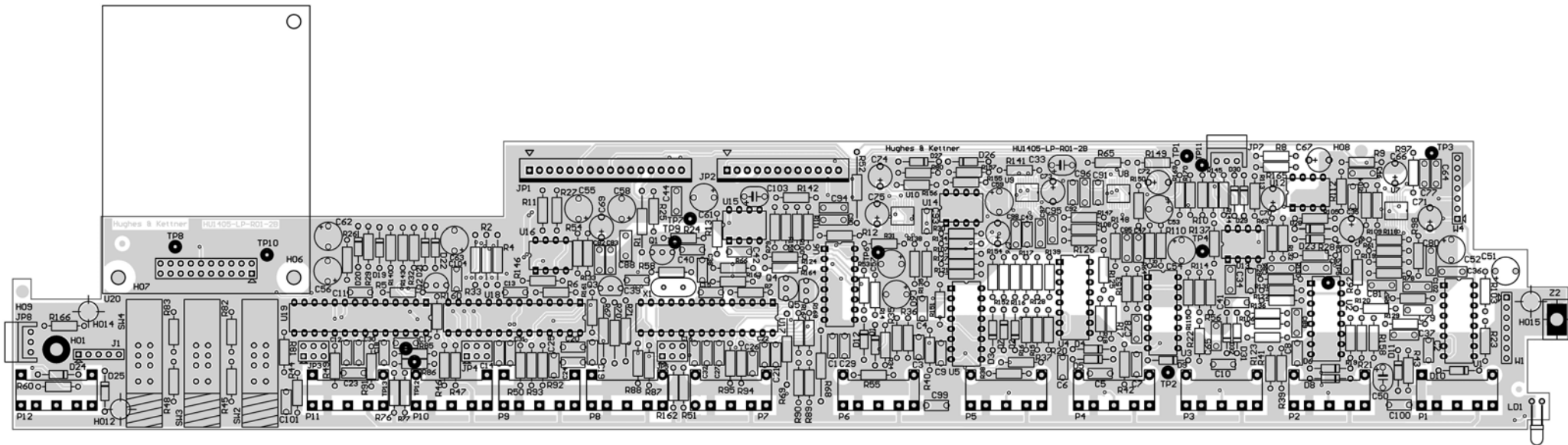


HOUSING



NA = not assembled part ----- EX = exclusive part, no alternative allowed
HT = high temperature part, assemble with distance from PCB

Hughes & Kettner TECHNOLOGY OF TONE		Title: Footswitch - FSM 4/32	
66606 St. Wendel / Germany			
Number: HU1405-SP-R04-1A	Version: 1	Revision: A	
Drawn by: B. Schneider	Date: 06.12.2005	Page: 1	
Checked by: A. Peter	Date: 06.12.2005	1 Pages	
PCB No.:			
Filename: HU1405-SP-R04_FSM4-32.Sch			



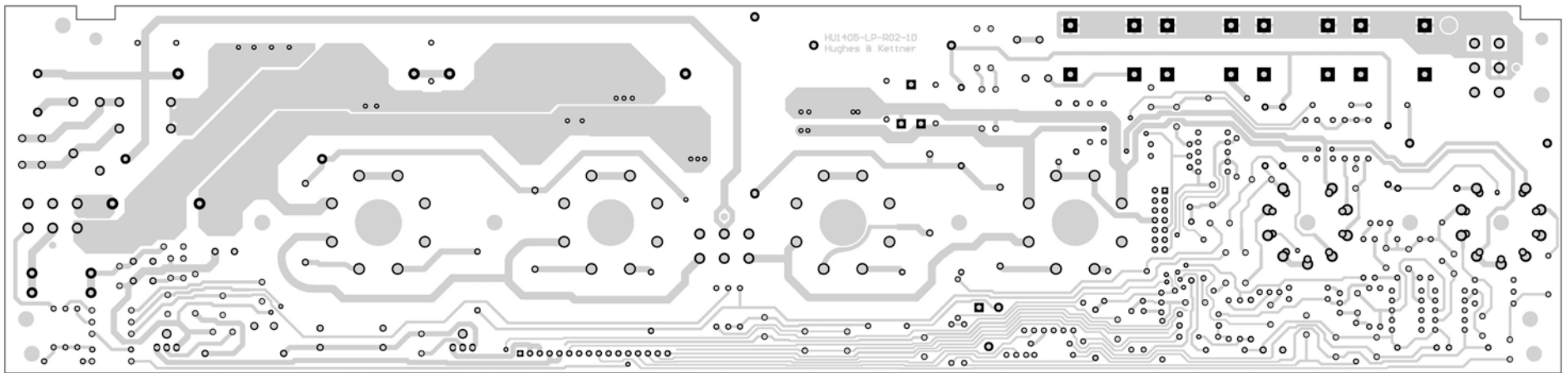
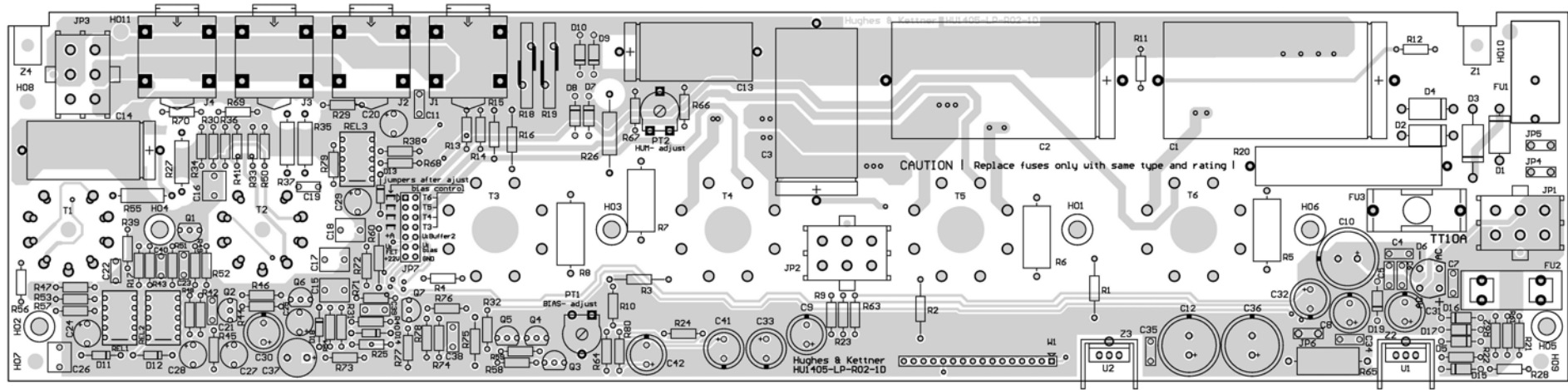
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ubaris		11.07.2006	1
CHECKED BY:		DATE	PAGES
			3
MATERIAL:		FINISH	
		OBERFLÄCHE	
FILENAME:			
HU1405-LP-R01-2B_PREAMP_HEAD			

TITLE
**SWITCHBLADE HEAD HU1405
 PREAMP**

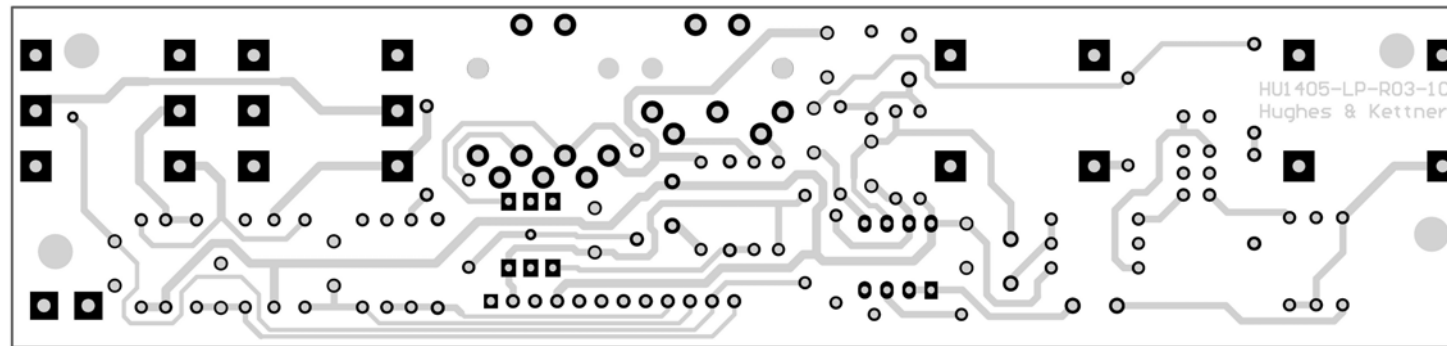
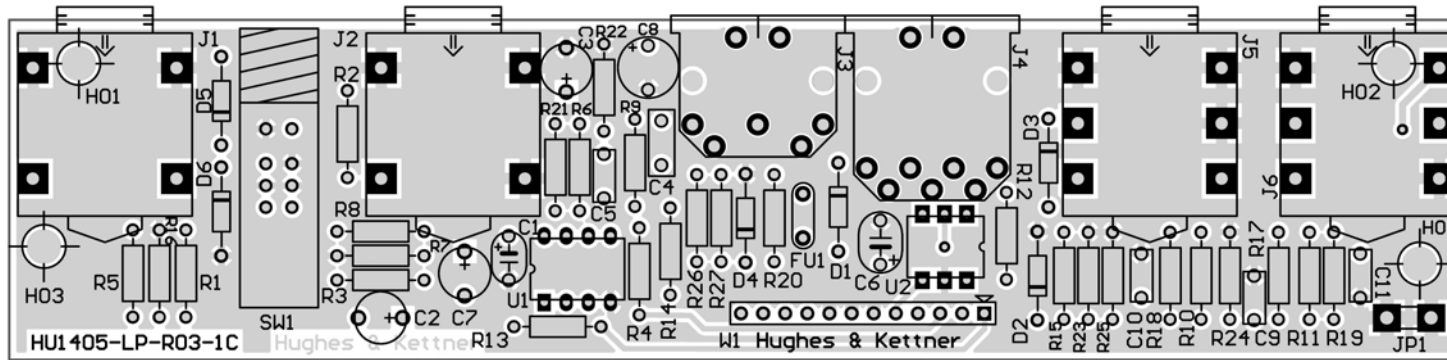
Hughes & Kettner

66606 St. Wendel / Germany



INDEX	CHANGES	RESP.

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DRAWN BY:		DATE	PAGE
ubaris		17.07.2006	1
CHECKED BY:		DATE	PAGES
			2
MATERIAL	FINISH		
	OBERFLÄCHE		
FILENAME			
HU1405-LP-R02-1D_POWERAMP_HEAD			



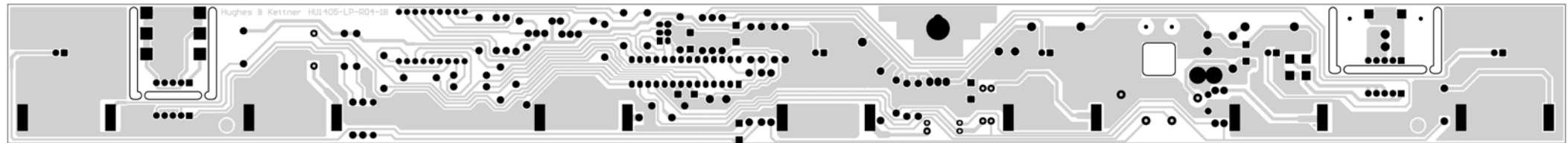
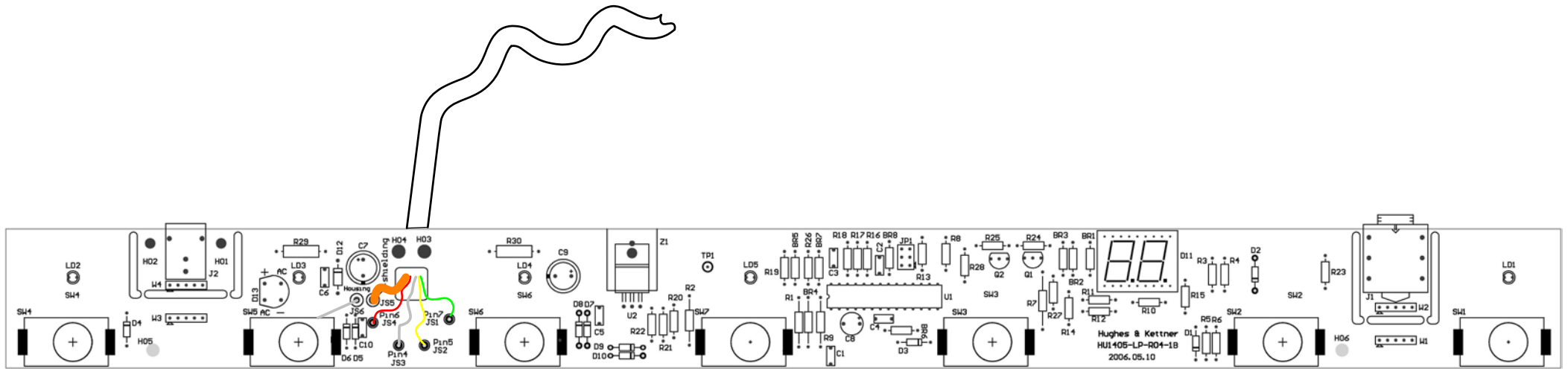
INDEX	CHANGES	RESP.

DRAWING-NO.		VERSION	REVISION
HU1405-R03-1C		1	A
DRAWN BY:		DATE	PAGE
ubaris		17.07.2006	1
CHECKED BY:		DATE	PAGES
			1
MATERIAL:		FINISH:	
		OBERFLÄCHE	
FILENAME:			
HU1405-LP-R03-1C_FXBOARD			

TITLE
**SWITCHBLADE HEAD HU1405
 FX-BOARD**

Hughes & Kettner

66606 St. Wendel / Germany



INDEX	CHANGES	RESP.

		TITLE Switchblade HU1405 FSM432 Footswitch	
66606 St. Wendel / Germany		DRAWING-NO. HU1405-LP-R04-1B	
DRAWN BY: ubaris		VERSION: 1	REVISION: A
CHECKED BY:		DATE: 20.07.2006	PAGE: 1
MATERIAL: Fehler: Keine Referenz		FINISH: OBERFLÄCHE	
FILENAME: HU1405-LP-R04-1B_FSM432_Switchboard		1 PAGES	