

BoutLin-1646 Professional line in > XLR out buffer module

With this module we provide a tiny balanced output circuitry which can be directly mounted in a panel. The internal line signal is buffered by this module in an extremely high quality.

- Convert your line output(s) to the best available balanced one(s) !
- Replace your balanced outputs by this best available one as used in the most expensive master mixing equipment.
- Balanced, transformer-like floating output with similar sound
- Professional audio with 6dB gain output, also lower possible.
- High quality power supply parts: WIMA MKP4 and Nichicon "Fine Gold" elco's.
- The patented **OutSmarts™** technology provides an absolute transparent circuit, capable of driving long and capacitive cables.

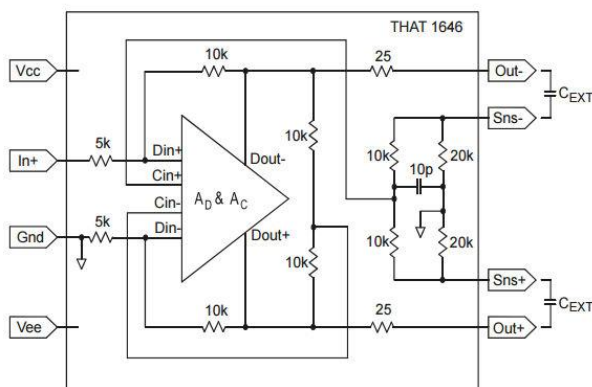
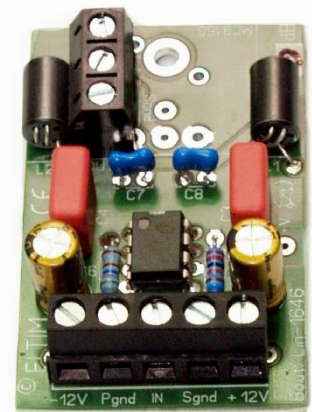
With the [THAT1646](#) IC as we use here, you obtain an extremely good balanced output on your preamplifier or any other circuit with an amazing voltage swing capability up to 16Vrms into 600 ohms, even with very long, capacitive cables! Actually, we and many others believe this is the best available solution for producing a balance output signal from a regular line signal. The gain is available as 0dB, +3dB or +6dB, so also for use in professional equipment.

Theory of operation

On this BoutLin-1646 module we provide a very special, patented balanced Opamp technology called **OutSmarts™**. The layout of this IC is as in the picture below, where a single line signal is converted by a very high quality Opamp to a balanced (XLR) signal, capable of driving even hundreds of meters balanced cable without signal losses.

This circuit converts a single signal in two exactly counter phase signals. For full details of this IC please read the datasheet of it.

The internal resistors are ultra-precise, laser trimmed, and in the 8-pin DIP already. Unfortunately, the – input is internally grounded, causing that we can't use this one for a Balanced out/Balanced in OutSmart circuitry. The brother 1606 can though, but is way too small for soldering by hand.

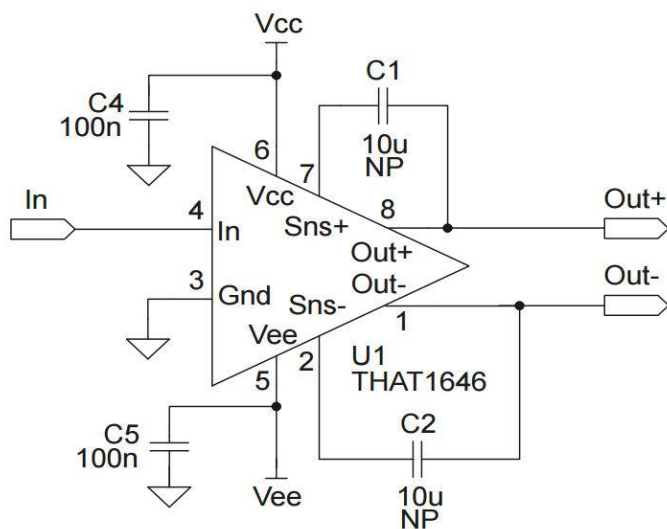


Please note that this is NOT just another Opamp based buffer circuit;
the THAT 1646 is very transparent and used in most expensive gear!

(Cext are small SMD caps, not leading signal)

The IC gain is defined by the internal precision 5k / 10k resistors and due to these fixed values set at +6dB. We added an L-pad resistor network in front of it, where we can attenuate -6dB, -3dB or 0dB, resulting in a total module gain of 0dB, +3dB or +6dB.

Basic circuit



The practical schematics is recommended by THAT and we use this on our BoutLin-1646 module. Actually it's just the IC, completed with some decoupling capacitors and power supply parts.

C1/C2 are required to prevent a slight DC voltage at the outputs. They do NOT need to be of high quality (not in the signal path!) and encountering a very low voltage, so we decided to use some extremely small MURATA SMD's here, mounted at the back side of the PCB.

Actually, there are no capacitors in the signal path at all. If you require them mount them external from this module.

Mounting

The gold plated XLR male (MC915G) chassis connector for the balanced output is mounted on the board.

Since this PCB hardly has any weight, mounting the connector to the cabinet chassis is sufficient.

Just widen up your Line input hole to \varnothing 22mm, drill two small holes for the mounting screws,

mount this PCB and connect the former Line input to the output tab of this PCB, that's it.

If you mount a 3-pole screw terminal instead (picture above), mounting is done with a single M3 bolt where otherwise the XLR is. The Line input signal is connected at the centre screw terminal of the board.

Some figures

Active component	THAT1646, Outsmarts™, professional balanced driver IC
Gain:	0, +3 or +6dB
Input impedance:	0dB: 9,4k, +3dB: 6,0k, +6dB: 5,0kohms
Output impedance:	50 ohms
Max voltage swing:	V power supply -2.2V (27,5dBu max)
Frequency range:	> 10MHz.
Slew rate:	> 15V/uS
Distortion:	< 0,0007% THD
Noise figure:	< 101dBu
Output CMRR:	> 65dB @60Hz under all circumstances
Capacitive load:	unlimited
Power Supply voltage:	± 4 to 13Vdc
High voltage supply:	± 18-63V (or higher with extra series resistors)
Power supply current:	6mA (15mA while using high voltage leads)
Dimensions	55x34x27mm (LxWxH)

The output is short circuit protected and suitable to use very long cables.

DIY

We like to invite you to visit our [webshop](http://www.eltim.eu) where over 15.000 products can be found, all for high quality audio DIY. You'll find our own wide range of modules, drive units, crossover parts, connectors, cabinets, etc. etc.

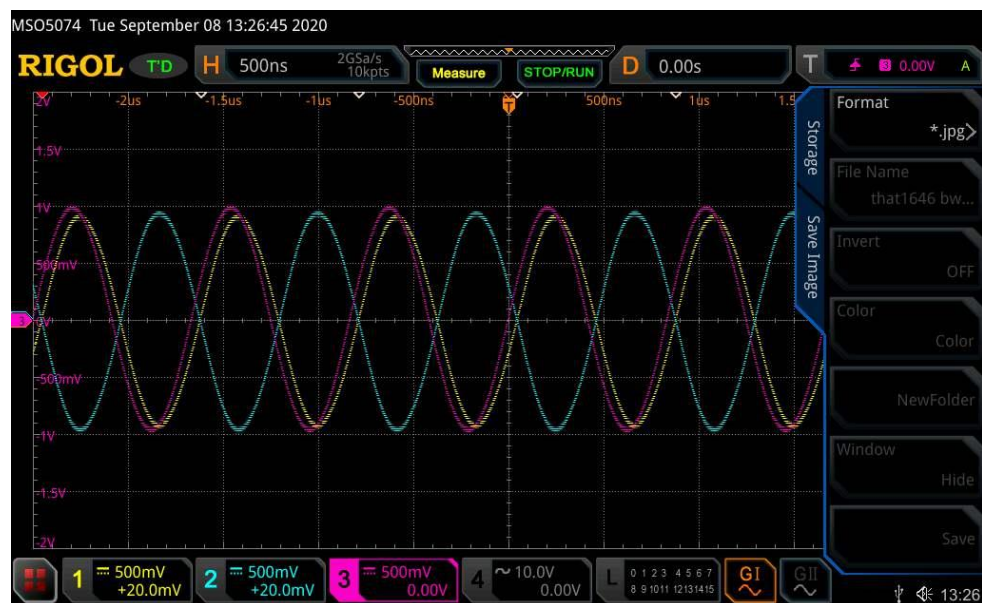
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LinBout-1646 running at 1kHz/1V, 0° phase shift from input to + output.
 Yellow is +out (0°), Blue is -out (180°), Magenta is input signal.



The same setup, now running under **1,2MHz** /1V.
 We only now see a phase shift compared to the input and a slight gain loss.
 Outputs crossing at the centre line and no distortion shown.
 Visible distortion shows above 1,5 MHz in a simple test situation.

NOTE: measurements done without input capacitor and Pgnd and Sgnd connected.

We have never seen a Line > Balanced circuit capable of this.