



## Technical Notes Volume 1, Number 12C

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# Polarity Conventions of JBL Professional Transducers and Systems

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### Introduction:

When Jim Lansing founded JBL in 1946, he brought with him a number of traditions developed during his previous years at Lansing Manufacturing Company and at Altec-Lansing Corporation. One of these dealt with polarity conventions different from those eventually adopted by the burgeoning loudspeaker manufacturing community. The majority of JBL transducers at that time exhibited inward motion of the cone when a positive-going signal was applied to the red input terminal, and this convention was, in many cases, carried over into loudspeaker systems as well. As we can best determine, the original polarity decision had been made by Lansing on an arbitrary basis. As industry standardization began during the 1950s, JBL took note of the fact that the company already had a large base of users in the field and that the productive "lifetime" of JBL's transducers was indeed a long one. Any substantial change in product operating standards for existing models would have caused chaos in the field.

The situation began to change when JBL first introduced systems intended primarily for musical instrument (MI) applications. Since these systems traditionally used 1/4" phone plugs for signal input, there was no easy way for the user to invert the input signal polarity. However, there was a need for JBL's MI products to be consistent with the rest of the indus-

try, since there has always been considerable mixing and matching of systems from different manufacturers in the field.

As time has gone on, there have been many pressures, both internal and external, for JBL to convert to the "positive-to-red" standard. Such a prospect has never been taken lightly, simply because no company has more transducers in active use in the professional field than JBL.

Beginning in the early 1990s, JBL began an orderly transition to the positive-to-red standard in accordance with practices recommended by the AES, EIA, IEC, and other standards organizations. This process has been underway since that time, with changes being applied to new transducer models and loudspeaker systems. The firm decision was made that no "legacy" transducers in existence at that time would be changed during their remaining catalog lifetime. In most cases, JBL loudspeaker systems, even if they make use of negative polarity transducers, have been internally wired so that they "behave" as positive systems. That is, a positive signal at the red or positive terminal of the system will cause the low frequency cone to move outward.

For the transition to be orderly, it is essential that all users of JBL Professional products have access to a complete listing of polarity conventions of current and past products, and that all new and updated specification sheets carry a clear indication of polarity. In addition, all new cone transducers, which will be of positive polarity, will carry a small sticker

placed next to the terminals indicating the new convention.

Bi- and triamplified systems are very common-place today, and these have all been configured at the input connector to produce a positive low frequency output signal when a positive-going signal is presented at pin 2 of the XLR input or tip of a tip-ring-sleeve input connector. The assumption is made that all connections in the system have been locked in place internally by JBL and that all pertinent field assembly documents have been carefully followed. A further assumption is that systems using quarter-inch or Speakon connectors have been wired according to industry polarity standards.

This new version of Technical Notes Volume 1 Number 12 spells out the polarity conventions of all current products, along with those of earlier products and product groups that have been discontinued but which may still be used in the field and that are supported by repair activities and spare parts. This new publication is current as of the second quarter of 2005.

### **Terminology:**

**Positive systems:** A system or transducer is said to be positive if a positive-going voltage applied to its red (or non-black) input terminal causes a positive pressure at the acoustical output of the device. For cone transducers, the cone will move outward and can be easily seen. For compression drivers, a positive-going pressure can be measured at the driver's exit.

Many systems and transducers do not have color-coded input terminals, and in these cases one terminal is usually labeled with a + sign. Consistent with the positive standard, a positive-going signal at the positive terminal will result in outward motion of the cone.

**Negative systems:** A system or transducer is said to be negative if a positive-going voltage applied to its red (non-black) terminal causes a negative pressure at the output of the device.

### **Polarity of JBL Professional systems and transducers:**

The following is a comprehensive listing of for-

mer and current JBL Professional systems and transducers by product category. Within each category models are indicated as positive or negative. The obsolete models included here are those that are still supported by company repair service and spare parts.

#### Musical instrument transducers:

The following models are negative:

E110-8	E120-8, 16
E130-8	E140-8
E155-4, 8	

The following models are positive:

M121-8  
M151-8

**Control Monitors:** all models are positive:

Control 1	Control 1 Plus
Control Micro	Control 1AW/70
Control SB Micro	Control 5
Control 10L, R	
Control SB-1	
Control SB-5	
Control 12SR	
Control Contractor Series	

#### Studio Monitors:

All 4300-Series models (except models 4311 and 4312L, R) are negative

The following models are negative:

4406	4408L, R
4410L, R	4412L, R
4425L, R	4430L, R
4435L, R	

The following models are positive:

4206	4208
4311	4312L, R
4408A-L, R	4410A-L, R
4412A-L, R	6208
DMS-1	LSR4300-Series
LSR-Series	LSR6300-Series

**Compression Drivers:** the following models are negative:

2402H	2404H
2405H	2426H, J
2427H, J	2446H, J
2447H, J	2450H, J
2451H, J	

Cone Transducers: the following models are negative:

LE8T-H	2105H
2118H, J	2123H, J
2202H	2206H
2220H, J	2226H, J
2235H	2240G, H
2241G, H	2245H

The following models are positive:

2012H	2020H
2242H	

Coaxial transducers: the following models are positive:

2142H	2152H
2155H	

Cinema systems:

3000-Series systems; the following models are positive:

3622N	3677
3678	3632
3632T	3678-LF
3639	

4000-Series systems; the following models are positive:

4622	4622N
4632	4632T

4000-Series systems; the following models are negative:

4670D	4675C
4675C-4LF	4765C-8LF

5000-Series systems; the following models are negative:

5671	5672
5672Bi	5674

Cinema subwoofers; the following models are negative:

4642	4645
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Cinema subwoofers; the following models are positive:

3635	4641
4642A	4642A-GS
4645B	4645C

Cinema surround systems: the following models are negative:

8330	8333
8340	

Cinema surround systems: the following models are positive:

3310	8325
8330A*	8340A*

(\*Note change from previous model numbers)

Enclosed utility systems:

The following models are positive:

SLT-1	4612OK
8216A	8216AT

The following models are negative:

4660A	4671OK
4652	

Application Engineered Series (Prefixes AM, AC, AL, ASB, SH): all models are positive

Architectural Series (Prefix AS): all models are positive

Array Series (Models 4890A, 4892, 4893, 4894): all models are positive

Cabaret Series (Models 4602, 4612, 4622, 4623, 4625, 4627, 4680, 4690, 4695): all models are positive

Concert Series (Models 4825, 4828, 4842, 4845, 4847, 4850, 4851, 4852, 4853, 4860, 4861, 4862, 4863, 3866, 4870, 4871, 4872, 4873): all models are positive

Control contractor Series: all models are positive

EON Systems (Prefix EON): all models are positive

HLA Series (Prefix HLA): all models are positive

JRX Series (Prefix JRX): all models are positive

MPro Series (Prefix MP): all models are positive

Marquis Series (Prefix MS): all models are positive

MR Series (Prefix MR): all models are positive

Precision Directivity Series (Prefix PD): all models are positive

Soundfactor Series (Prefix SF): all models are positive

Sound Power Series (Prefix SP): all models are positive

SR Series (Prefix SR): all models are positive

SR Series X (Prefix SR): all models are positive

SR Series II (Prefix SR): all models are positive

SRX Series (Prefix SRX): all models are positive

TR Series (Prefix TR): all models are positive

Venue Series (Prefix VS): all models are positive

Vertec Series (Prefix VT): all models are positive

VRX Series (Prefix VRX): all models are positive

#### **General Note on Applications:**

JBL Professional has always recommended that absolute polarity standards be maintained throughout an audio system, from microphone input to loudspeaker output. Since most microphone and electronics manufacturers adhere to the “pin-2 hot” convention, this ensures that a positive-going signal at the input of a microphone will produce a positive-going signal at the non-ground output of a power amplifier at the end of the chain. If JBL negative convention loudspeaker systems or transducers are used, the required polarity inversion should be made *at the system or transducer input terminals themselves*. Note carefully: making the polarity inversion anywhere else in the audio chain is an invitation to confusion.



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