REAFFIRMED 2004

SMPTE RECOMMENDED PRACTICE

RP 134-1994
Revision of RP 134-1986

Polarity for Analog Audio Magnetic Recording and Reproduction

1 Scope

1.1 This practice specifies the polarity of the signal on the pin connections from a microphone presented with a positive pressure on the diaphragm. It also specifies the resulting positive magnetization when the positive microphone signal is recorded on any magnetic media.

1.2 This practice also specifies how this positive magnetization should be played back and fed through a reproducing system to provide a positive sound pressure from the loudspeaker.

2 Microphone polarity

When a positive pressure is applied to the diaphragm, a positive waveform should appear on pin 2 with respect to pin 3 of an XLR-3-type male connector as provided on the microphone. (This should not be confused with either "phantom" or "T" remote dc supplies used for powering condenser microphones.)

3 Audio chain polarity

The audio chain shall preserve correct polarity from input to output. When an XLR-3-type connector is used for input and output, if pin 2 has a positive waveform at its input, then a positive waveform should appear at its output connector on pin 2.

4 Recording Polarity

The recording equipment, being fed a positive waveform on pin 2 at its input, will provide a positive magnetization on the magnetic recording medium. A positive magnetization is the same direction of magnetic flux flow as that observed in a bar magnet where the flux flows out of the north pole and into the south pole. This flux flow is in the direction of the physical movement of the magnetic surface.

5 Reproduction polarity

Reproduction of a positive magnetization on the magnetic surface will provide a positive waveform on pin 2 of an XLR-3 connector or the positive terminal of the connector at the output of the magnetic reproduction equipment (see annex A.1).

6 Loudspeaker polarity

When this positive waveform is fed into the B-chain of the reproduction system (the power amplifier and loudspeaker), it should provide a positive movement of the loudspeaker diaphragm towards the audience.

Annex A (informative)
Additional data

A.1 A bar magnet has an external field with the flux flowing out of the north pole into the south pole (see figure A.1). A recording channel is positive when a positive pulse produces a magnetic flux flow across the recording head gap in the direction of the tape or film movement. A reproducing channel is positive when a positive magnetization on the tape or film produces a positive pulse at the output (see figure A.2).

Positive polarity may be simulated in a reproducer by passing a dc pulse through a wire which is parallel to the reproducing head gap. The dc pulse should be with the

Approved January 12, 1994

positive current flow through the wire passing through the page toward the observer in figure A.3. (This is in accordance with the right-hand flux rule: Grasping the wire with the right hand, the current flow is in the direction of the thumb and the flux flow is in the direction of the fingers.)

A.2 A practical signal for measuring polarity can be generated in the induction loop by half-wave rectifying a 400-Hz sine wave. When the positive-going half-wave current flows through the conductor up through the page (figure A.3), this should produce a positive reading waveform at the output of the reproducer.

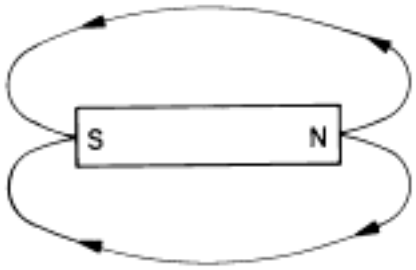

Figure A.1 – Flux field

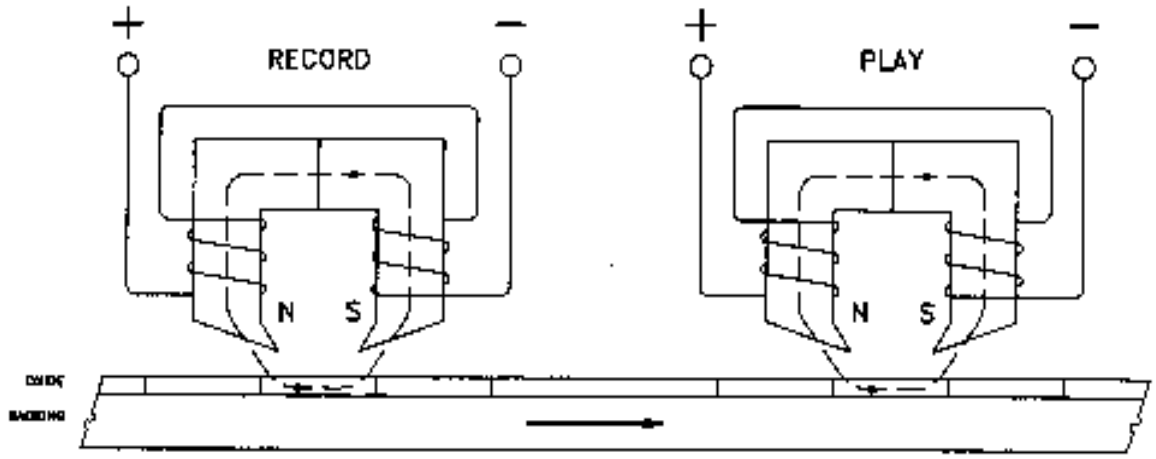

Figure A.2 – Orientation of magnetic head gaps

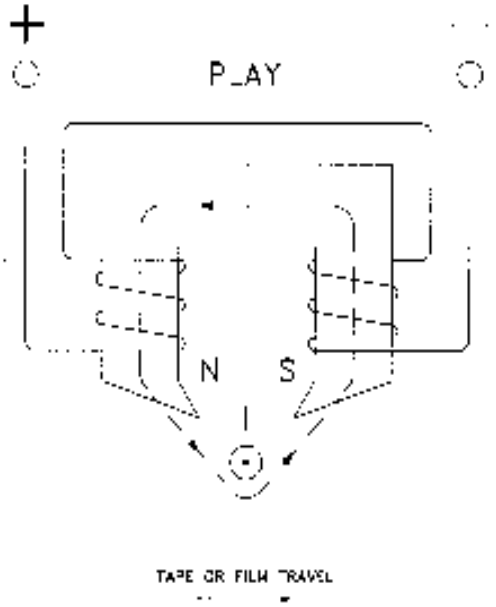

Figure A.3 – Polarity measurement