Stereo Recordings with Coincidence Microphones

Based on works of the british technician Alan D. Blumlein in the early 30´s the stereo coincidence recording technique was developed. This lead to a most versatile and flexible method ideal for most recording and transmission situations in connection with the possibilities of modern microphone technology. Blumlein however had only ribbon microphones available for his research.

The basic advantages of the coincidence recording technique are:

- Direct mono compatibility without any phase problems
- By changing the level ratio between mid and side signal the virtual recording angle can be varied without any change of the physical placement
- By remotely changing directivity characteristics of microphones it´s easy to adapt to varying situations during recording such as large or small orchestra, hall with or without audience or partly filled, etc.

The theory behind the coincidence recording technique can simplified be described as follows:

a.) By summing up and substracting the signals of both microphones the Mid/Side information can be converted to a Left/Right infomation (normal stereo, XY technique). That means that:

$$M+S = X = \text{left}$$
$$M-S = Y = \text{right}$$

or:
$$X + Y = (M + S) + (M - S) = 2M \ \rightarrow \ (X+Y)/2 = M$$
$$X - Y = (M + S) - (M - S) = 2S \ \rightarrow \ (X-Y)/2 = S$$

b.) In graphic presentation the equivalent directivity patterns shown in Fig 1 are derived from X/Y and M/S technique.

Please note that by varying the ratio between mid and side signals the effectice recording angle
in the X/Y transformation changes.

Practical ways of realizing summing and substracting

a.) With input- and output transformers (e.g. in radio broadcasting) (Fig 2)
b.) With electronic matrix simulating the function of the transformers (e.g. outdoor recordings)
c.) By using four mixer inputs on standard mixing consoles (Fig 3)

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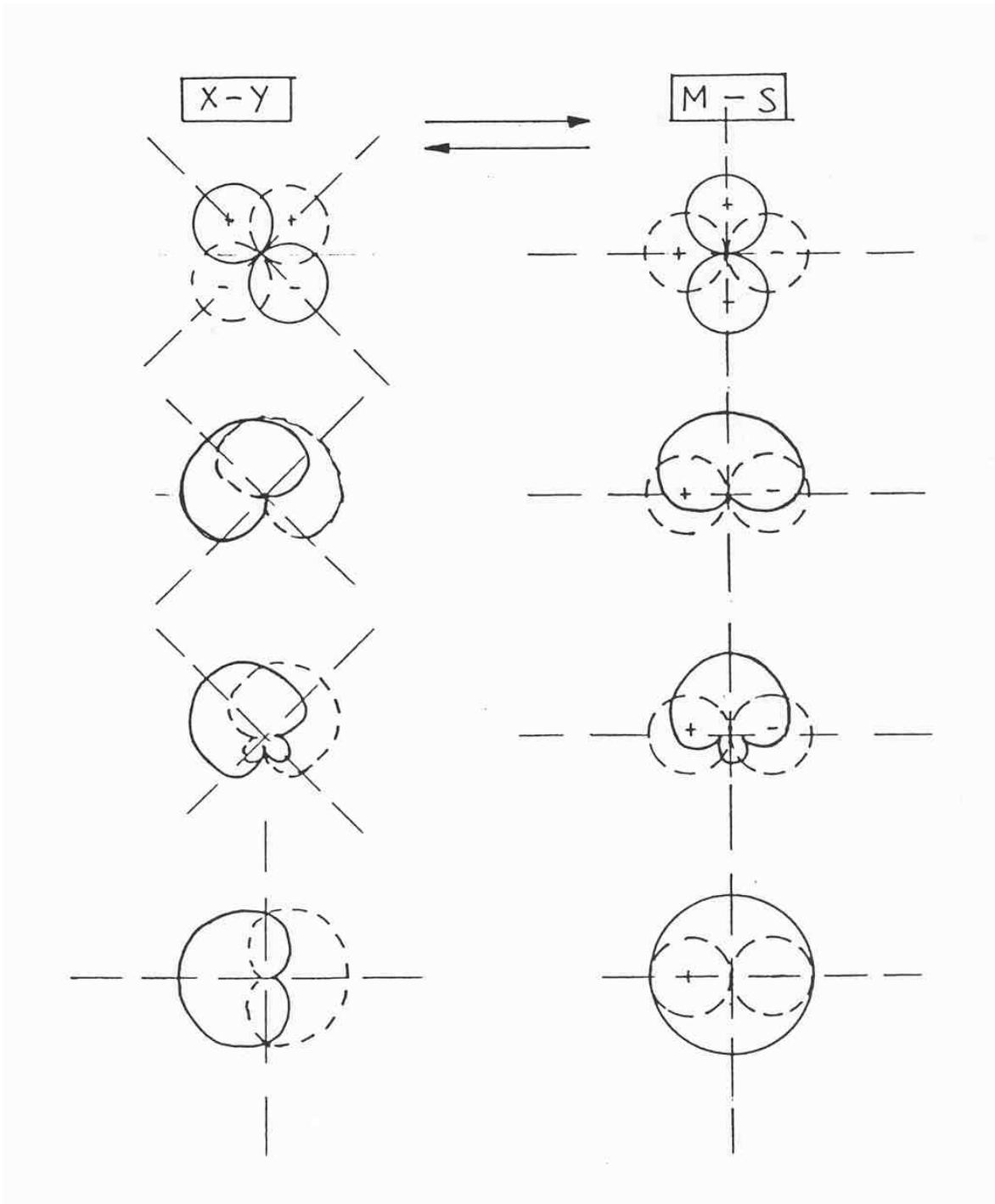# Stereo Recordings with Coincidence Microphones

Polar Pattern Arrangement

Fig 1

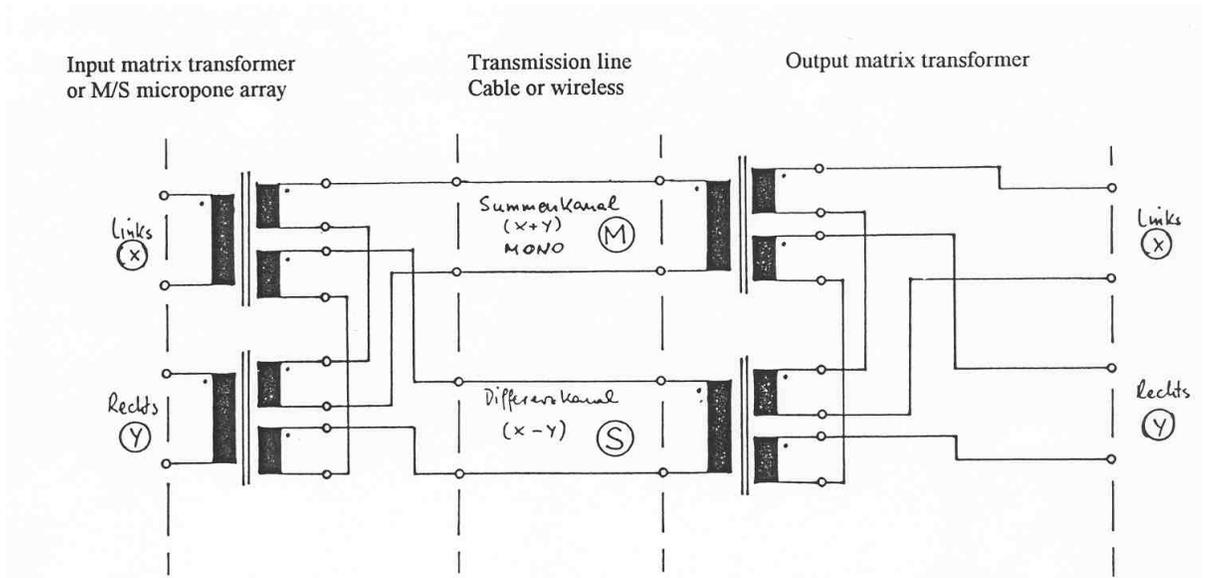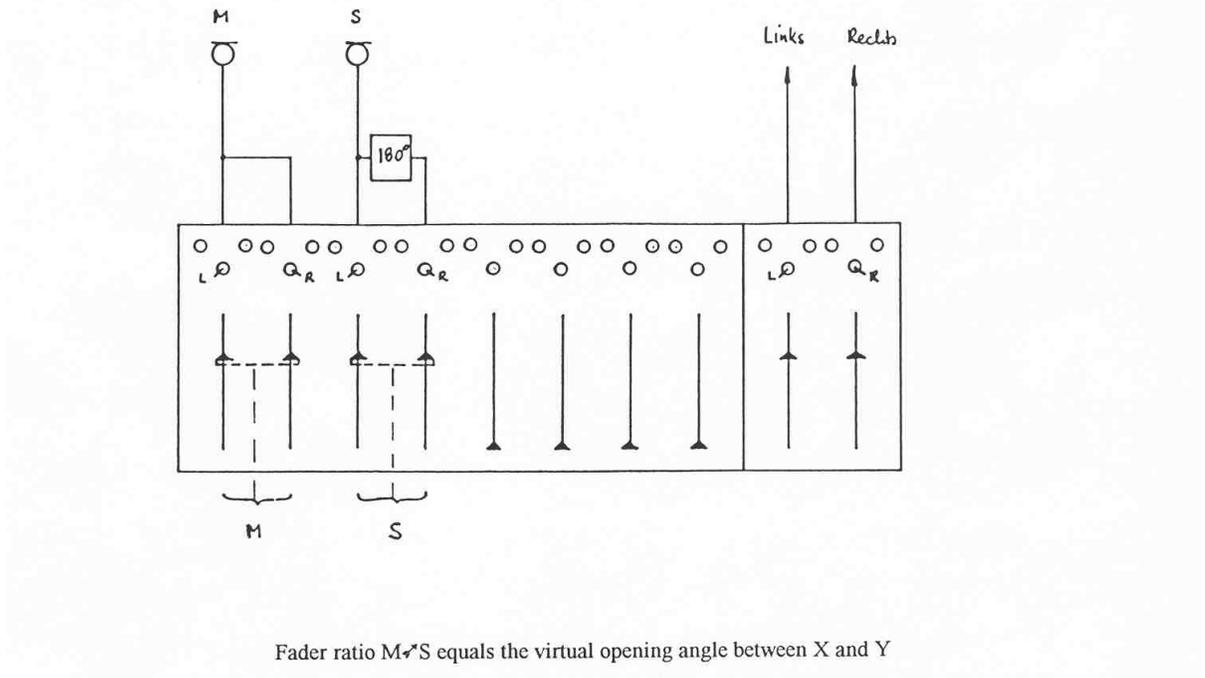# Stereo Recordings with Coincidence Microphones

Matrixing

Fig 2

Fader ratio M∕S equals the virtual opening angle between X and Y

Fig 3