

AUDIO ENGINEERING ASSOCIATES

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**New M/S Stereo
TECHNOLOGY**

**MS38 DM
Dual Mode, M/S and L/R
LINE LEVEL ACTIVE MATRIX**

**MS380 TX
Stereo Microphone Preamp
with
Dual Mode M/S and L/R Active Matrix**

and

**MS380 BP
Battery Power Supply**

Developed for stereo broadcasting by Lauridsen of Danish Radio in the late 1950's, MS stereo has rapidly gained favor in Europe as the technique of choice. However it was not until the advent of stereo television broadcasts in the US that this technique started to be widely known here. Wes Dooley and Ron Streicher's seminal technical papers and their use of MS in the Emmy Award winning broadcast by KCET of Beethoven's Ninth Symphony performed by the LA Philharmonic and the LA Master Chorale accelerated this process. Subsequently, the system has gained users as diverse as WGBH, LSU, NPR and Academy Award winning cinema sound facilities such as Blue Light and Lucasfilm's Sprocket Systems.

Quality stereo production with uncompromised monaural compatability can be done quickly and easily in M/S stereo. Only with this method can a good, versatile stereo image be achieved while maintaining a fully discrete monaural signal. An automatic benefit is the reduction of the ambience component that occurs when M/S stereo is summed to mono.

The new "dual mode" MS38 DM and MS380 TX reflect continuing development of the potentials of MS. Widespread international use of the original MS38 provided the user feedback that is incorporated in the new

generation of "dual mode" units. New applications such as using the S channel for additional crowd response heard only by the stereo audience are being developed. (The announcer's microphone is fed to the M channel and the crowd response microphone into the S channel.) A similar trick can be done with artificial reverb to control the relative reverb balance for the mono and the stereo listeners .

The principle of the M/S system is the matrix combining of a forward-facing microphone (the M, mid, or mono signal) with a laterally-oriented bi-directional microphone (the S, side, or stereo signal). Often these are stereo microphones with remote pattern control of the M channel, for enhanced flexibility.

(Figure 1)

The M pickup provides the central sound image, and is the discrete monaural signal. The S pickup provides the stereo directional information. Since both respond in different ways to the ambient or reverberant information present, this is the basis for MS stereo's unique ability to properly reduce the ambient component for mono listeners and increase it for the stereo audience.

The M and the S signals are combined in a sum-and-difference matrix (M+S and M-S) to produce conventional stereo (Left and Right) signals. This matrixing to stereo can be done either originally or during post production.

The versatility of the technique is that the user may adjust the stereo image as needed. By proper placement and selection of the polar pattern of the M microphone, the discrete monaural signal can be optimized. Then, by adjustment of the relative balance of the M-to-S signals, an optimum stereo image can be created. When this stereo image is folded to mono, the result is the same as the discrete monaural pickup. $\frac{1}{2} [(M+S) + (M-S)] = M$

The MS38 DM and MS380 TX provide high accuracy decoding (matrixing) of the M and S signals with single-knob control of the stereo width. In the LR mode this unit functions as a double matrix and will

provide stereo width control for conventional material in the Left Right format. Previously unobtainable, post production control of the stereo image is now easily accomplished.

Additional information concerning the M/S stereo technique can be found in the paper: "M-S Stereo: A Powerful Technique for Working In Stereo" published in the **Journal** of the Audio Engineering Society, Vol. 30, No. 10, pp. 707-718, October, 1982. This paper was also included in the anthology: "Stereophonic Techniques," published by the Audio Engineering Society.