



A JBL INSTALLATION

JBL AT THE COW PALACE

Opened in 1941, the Cow Palace in San Francisco is one of the oldest convention sites in the United States. Its curious name derives from the original intent, that of a livestock exposition venue, which had first been thought of early in the 1930's.

Over the years, the Cow Palace has been used not only for conventions and livestock exhibitions, but for sports events, circuses, and of course rock concerts.

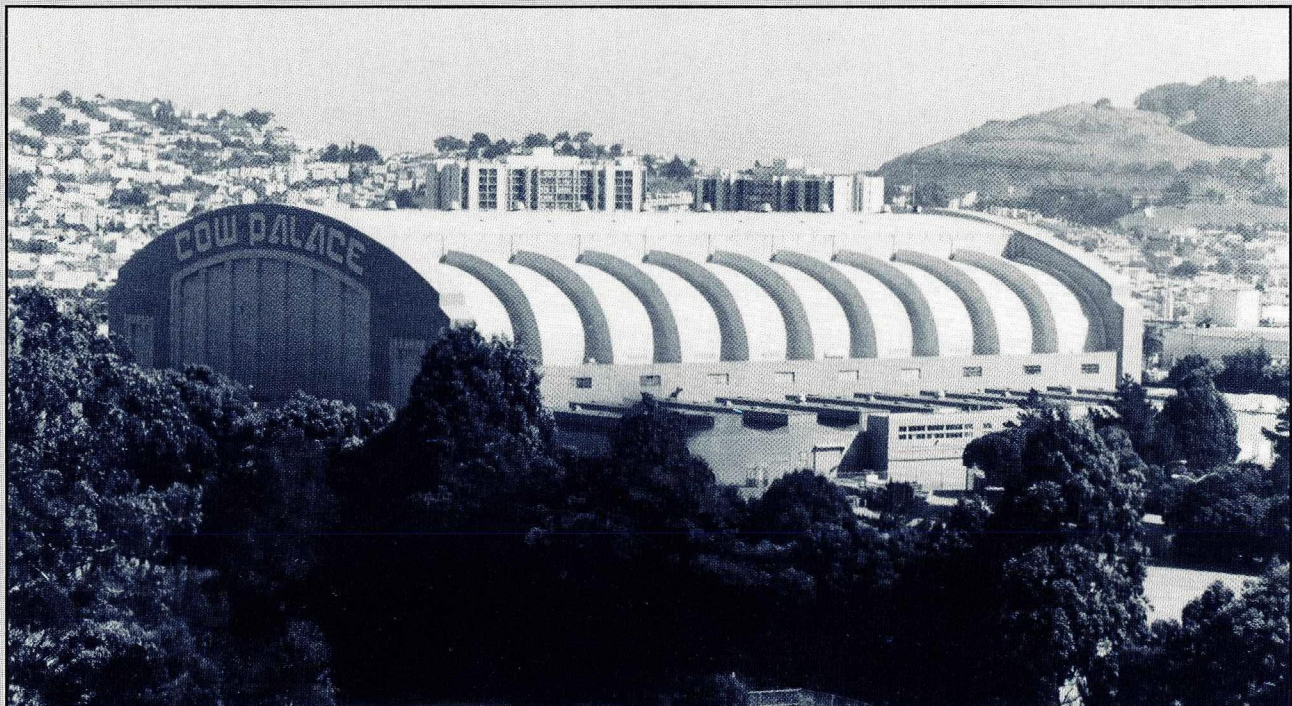
In April 1987 it was decided to replace the old sound system in the

main arena, and Charles Catania, of San Rafael, CA, was engaged to design the system.

The main arena is 113 meters (374 ft) in length and 84 meters (278 ft) wide. The height is 30 meters (100 ft) at the centerline. The volume of the space is approximately 278,000 cubic meters (10,000,000 cubic ft), and seating ranges from 10,380 to 14,700, depending on configuration for various events. Acoustically, most of the interior surfaces are fairly reflective, rendering the space quite reverberant.

Many events, such as boxing matches and rodeos, have very high spectator noise levels, and the new system was designed to produce undistorted levels of 95 dB at the longest throws, and up to 100 dB in other areas.

Since no acoustical treatment was indicated at this time, the system would have to provide sufficient direct-to-reverberant ratio to ensure good intelligibility.



JBL



View of Main Loudspeaker Array

Further economic constraints required the minimum of components and utilization of as much of the old system as was practicable. The original system was left intact at the east end of the space, while a new JBL system was installed in the center. For musical events, which originate at the east end of the arena, both systems are used, with appropriate time delay compensation. However, for most sporting events, only the new central cluster is used. In this case, the longest throw (to the west corners) is 70 meters (230 ft), and the shortest is 25 meters (84 ft).

The loudspeaker array consists of 10 pairs of high and low frequency components. Each group is separately bi-amplified for optimum quality and ease in system adjustment. JBL Model 2365 horns with 2445 drivers were used for long throw applications into each corner of the arena, while JBL Model 4550 enclosures with dual 2225J low frequency drivers were used for low frequency coverage.

The remaining six systems in the array were used for near throw coverage and consisted of JBL Model 2360 high frequency horns with 2445J drivers and JBL Model 4560 enclosures with single 2225H low frequency transducers.

These elements are clearly indicated in the photograph of the central array and in the electrical diagram. All crossovers were set at 800 Hz. Component aiming was accomplished by using a mapping program developed by Catania for operation on the IBM PC.

JBL Loudspeaker Components:

4	4550BKA LF enclosures
8	2225J LF transducers
6	4560BKA LF enclosures
6	2225H LF transducers
6	2365 Bi-Radial™ horns
4	2360 Bi-Radial horns
10	2445J HF drivers

There are two basic modes of system operation:

■ Arena System On:

In this mode, signal input is presented to all elements of the main array. This is the normal mode of system operation, and the old east array is turned off.

■ Stage System On:

In this mode, the east (stage) array is turned on, and the inputs to the four loudspeaker groups covering the East and East Down parts of the arena are shut off. The remaining North, South and West portions of the central array are left on, and appropriate time delay is inserted into the system (30 msec for the sides and 50 msec for the back) for best overall effect.

Mechanically, the new central array is suspended from a custom metal platform suspended from the ceiling by four half-ton electric hoists. The hoists have enough vertical travel to allow the entire array to be lowered to floor level for any adjustments or component replacements which may be required.

Cable runs consist of 12-AWG wire, and the length to the rack room is about 121 meters (400 ft), creating a total of 1.27 ohms of line resistance per run. Additional amplifier power was made available so that the

acoustical calculations made by the system designer were met.

System adjustment and checkout proceeded smoothly. Originally, the system was positioned 22 meters (72 ft) above the floor, and in that position, echoes off the far walls were interfering with intelligibility. This situation was substantially corrected by lowering the array to a height of 15 meters (50 ft), which lessened the amount of sound striking the far walls, while at the same time improving the direct-reverberant relationship in near throw coverage.

CREDITS:

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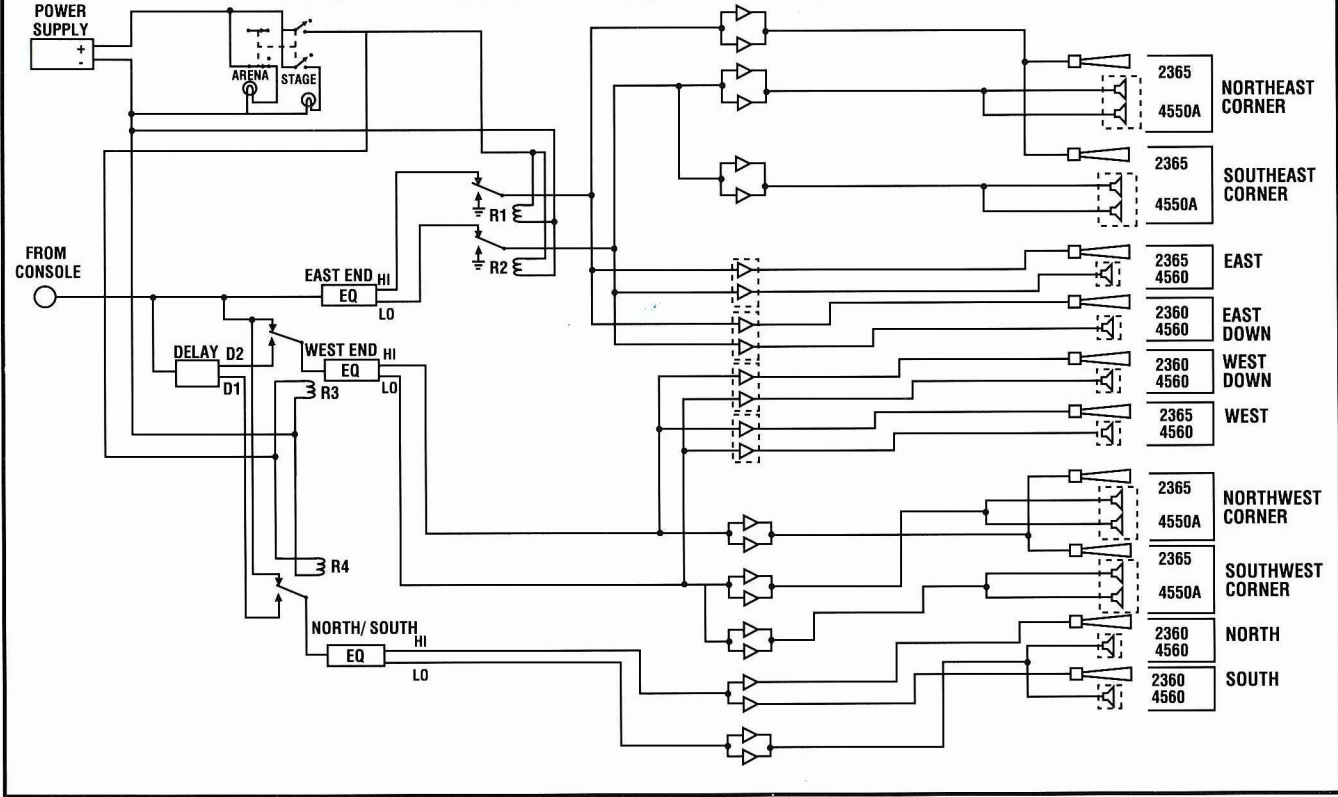
System Design:

Charles J. Catania
Catania Sound Inc., San Rafael, CA
Special thanks to Sam Amato of
Catania Sound, Inc.



View of Main Arena

SINGLE LINE DIAGRAM of MAIN ARENA and SOUND STAGE SYSTEM



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