

A JBL INSTALLATION

The Academy of Motion Picture Arts and Sciences, Beverly Hills, California

Everyone knows that an Oscar is an Academy Award, but not everyone knows that the sponsoring organization's full name is the Academy of Motion Picture Arts and Sciences.

The Academy, as it is known in the trade, began in the late twenties. Its prime purpose was to recognize excellence in the arts and sciences of motion picture making, and to this end the yearly awards ceremony has taken on worldwide interest.

On a daily basis, however, the Academy stays quite busy with many other tasks. There is a comprehensive library on film history, art, and science, which draws researchers from around the world. The Academy maintains updated listings and issues a Directory of actors and actresses available for motion picture work.

There are various committee activities dealing with technology as well as artistic aspects of film making, and there is the state-of-the-art Samuel Goldwyn Theater located at Academy headquarters, which is used for special screenings an average of five nights a week.

In April 1984, the Goldwyn Theater was closed for remodeling. Carpeting was replaced and the front stage area was reconfigured. On the technical side, a new screen was installed, and an entirely new B-chain (the audio equipment following the master gain control) was specified for the sound system.

JBL loudspeakers were selected for the installation, based largely on research which the company had been engaged in since the early eighties. In 1981, Mark Engebretson and John Eargle demon-

strated a two-channel version of prototype loudspeakers which departed from theater tradition in two significant respects. Uniform coverage high-frequency horns were used instead of multi-cellular horns, and ported direct-radiator low-frequency systems were used instead of vented horn systems. The new system design stressed both uniform power response and smooth on-axis response, and the result was a system which provided excellent coverage throughout the house with a minimum of equalization.

Long before the installation date, Dan Ross of the Academy and John Bonner of Warner Hollywood Studios conferred with John Eargle of JBL to determine actual coverage, bandwidth, and level requirements in the house. All three men felt that surround channels were more important than many designers had considered them to be, and a decision was made early to specify "heavy artillery" in that area as well. To fulfill the low frequency bandwidth requirements, a battery of eight massive sub-woofers was specified. Bi-amplification was also specified for the screen channels for added acoustical headroom. Detailed system layout was accomplished using JBL's CADP central array design program.

The Goldwyn Theater was built in the mid-seventies, and the principal acoustical designers were Gordon Sawyer and Paul Veneklasen. The room volume is about 20,000 cubic meters (200,000 cubic feet), and the mid-band reverberation time is about 0.5 seconds. There are 1106 seats.

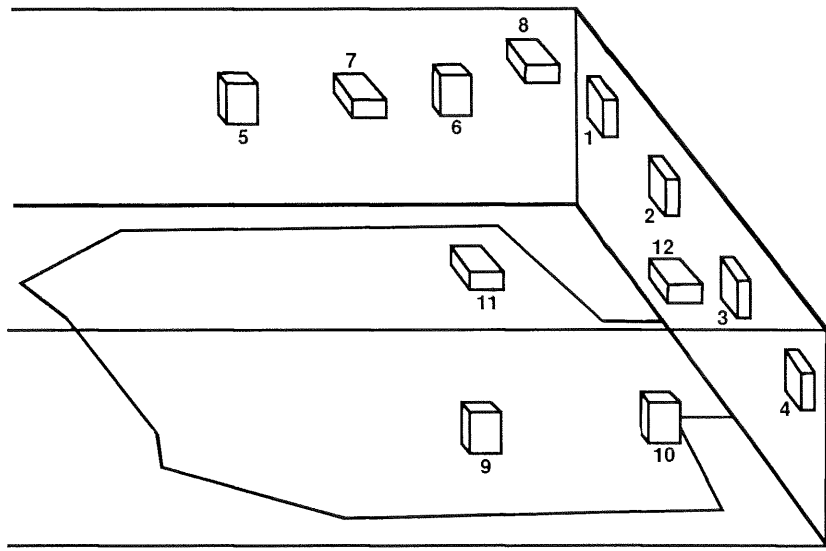
Although early reflections are carefully controlled through a set of precisely oriented side and overhead panels, the reflected sound field in the room is quite low. This is essential for good dialog intelligibility, but it does place stringent demands on system electrical power handling and distortion performance. In the Theater, levels of 115 dB SPL can be comfortably reached.

The surround system is composed of twelve loudspeakers, each using a large format compression driver. The loudspeakers are wired so that they can easily be reconfigured in the booth for split (stereo) surround use. Each side wall has four units placed in an articulated arrangement. Overhead, there are four additional surround loudspeakers facing downward. Through CADP, precise levels and



View of JBL five-channel system in Samuel Goldwyn Theater.

JBL



Locations of surround loudspeakers.

aiming angles could be determined for smoothest response, and the result is a surround system which has all the power handling capability one could want, along with remarkable diffusion of sound. Because of cross-firing of the side loudspeakers, it is virtually impossible to localize at any one of them.

Through the use of CADP, it was determined that the high-frequency horns in the screen loudspeakers should be aimed directly at the rear wall — not down into the middle of the audience. In doing this, the naturally smooth vertical off-axis fall-off of the horns is matched with inverse square losses from front to back in the house, so that total horn coverage is maintained within a range of ± 2.5 dB.

A great round of measurements was made toward the end of the installation month. JBL had a golden opportunity to make detailed system measurements in a large house, both with and without the screen. This is an opportunity which does not come along very often, and JBL was

quick to take it. As a result, the Academy system is probably the best documented large theater system on record. JBL learned much about the effects of screen losses, but there is more yet to be learned in this area.

The Goldwyn Theater plays to one of the most critical audiences in the world, the Hollywood film community. Their affirmation and approval of the system have been gratifying, and the company believes that new standards have been set. What JBL has learned with the Academy system has been carried over into the company's theater products, and the improvements are changing the way people listen to films everywhere.

Equipment Listing:

Screen Channels:

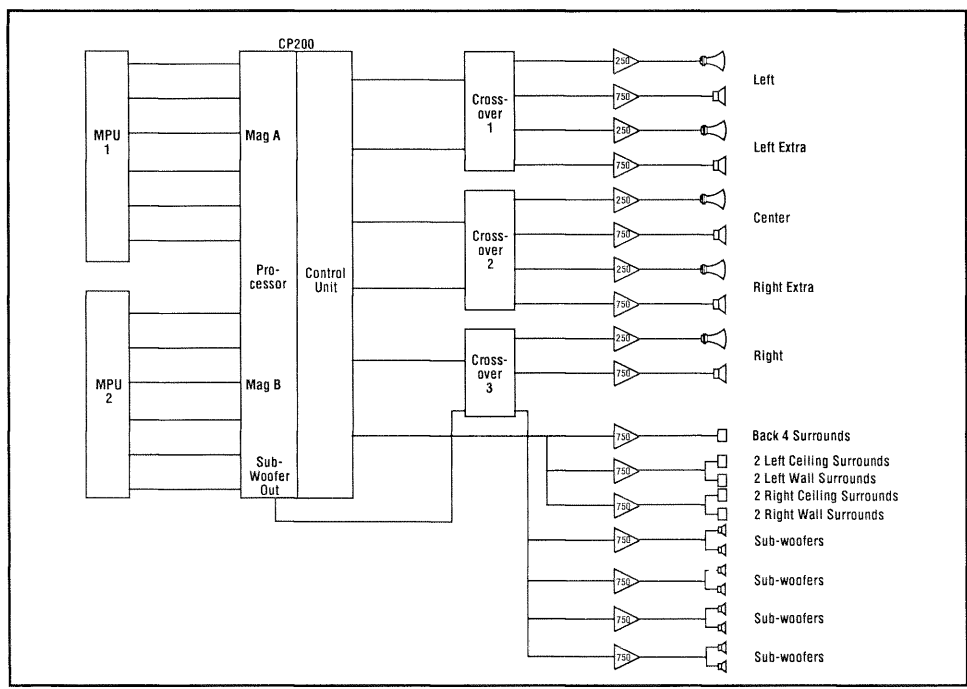
- 5-Model JBL 4675A-2 Systems
- Consists of:
 - 2-4508 LF Enclosures
 - 4-2225H LF Transducers
 - 1-2360A HF Horn
 - 1-2445J HF Driver
 - 1-2506 Mounting Bracket
- 3-JBL Model 5234A Electronic Dividing Networks (with 500 Hz power response corrected cards)

Surround Loudspeakers:

- 12-Model JBL 4673A Systems
- Consists of:
 - 1-4507 LF Enclosure
 - 1-2225H LF Transducer
 - 1-2380 HF Horn
 - 1-2445J HF Driver
 - 1-3115A Dividing Network

Sub-woofer Array:

- 8-Model JBL 4648 Systems
- Consists of:
 - 1-4518 LF Enclosure
 - 1-2245H LF Transducer



Audio block diagram for Academy system.

CREDITS:

Dan Ross, Academy of Motion Picture Arts and Sciences, Beverly Hills, California

John Bonner, Warner Hollywood Studios, Hollywood, California

John Eargle, JBL Incorporated, Northridge, California

Glen Glenn Sound, Hollywood, California



JBL Incorporated
8500 Balboa Boulevard
Northridge, California 91329, USA