

Audio Insiders

(Continued from page 20)

With this in mind, the difference in rigging system alloys becomes an important element. Steel alloys have greater strength than aluminum alloys. Also, steel alloys have a tendency to bend long before they break, whereas high strength aluminum is brittle and can break suddenly.

If the loudspeaker enclosure hardware is being borrowed from another industry, such as the aircraft or cargo control industry, it is important to determine if the hardware is approved for overhead suspension applications.

Much of the hardware that looks like standard aircraft or cargo control hardware is not. And most aircraft and cargo control hardware cannot be used for overhead suspension purposes.

Flyable loudspeaker enclosures almost always utilize some variation of internal bracing. Usually the internal bracing is fastened directly to the external flying hardware component. This distributes some of the load throughout the loudspeaker enclosure and increases the load capacity of the enclosure.

Much of the hardware that looks like standard aircraft or cargo control hardware is not. And most aircraft and cargo control hardware cannot be used for overhead suspension purposes.

The external part of the enclosure flying hardware system can take many different forms. Perhaps the most common systems are the threaded hole, the nut plate

(threaded plate), the pan fitting, the stud fitting, and cargo control track.

Truss Flying Systems

Once a loudspeaker enclosure is suited for flying, the flying hardware system is the next consideration. Flying hardware systems can be generally categorized into several distinct groups; grid truss (strap type) systems, modular grid truss systems, and modular mounted-truss systems.

A grid truss, or strap type, flying hardware system uses an over-all top truss from which the loudspeakers hang. Straps and cables hold the loudspeakers in place and adjust the tilt to the loudspeaker columns while each loudspeaker is suspended by the one above it and so on.

Grid truss flying hardware systems are easy to design and can appear to be cost effective at first. However this type of system can become very costly when used long term.

It is difficult to control the loudspeaker array direction and splay characteristics in a grid truss system. For this reason, a grid truss system is labor intensive and provides poor acoustic wavefront coherency.

The modular mounted-truss flying hardware systems use compact truss modules which are permanently affixed to the loudspeaker enclosure. Modular mounted-truss systems array the loudspeakers well and maintain a coherent acoustic wavefront.

System designs are simple and assembly is intuitive. Also, modular mounted-truss loudspeaker flying hardware systems assemble quickly and with a minimal crew.

At The Venue

With a viable loudspeaker rigging system engaged, our attention turns to the venue and safety. Loudspeaker array locations should be as far away from people as possible. Attachment to the venue should be appropriate, and should be performed only by a qualified professional rigger.

When assembling the loudspeaker array, be conscious of the surroundings at all times. Check and then double-check



Photo #1: A Promix (NY) System

the array assembly to insure that the rigging system is assembled properly, and that all attachment hardware is tight and showing no signs of wear or fatigue. Remember that the ultimate responsibility for accidents falls on the owner of the loudspeaker flying system.

Other components of the rigging system include shackles, wire ropes, carabiners, straps, round slings, clips, chain motors, beam clamps, and various other rigging hardware. All components must be designed and implemented into the system with the 5:1 design factor discussed earlier.

Also, all of these components must be rated for overhead suspension. Aluminum carabiners and carabiners without locking gates have no place in a loudspeaker rigging hardware system.

If forged eye bolts are implemented in the system, they must be of the shoulder variety and the angle of load must be thoroughly understood before the bolts are used. Shackles, quick-links, and clips must also be thoroughly understood, and the rules that apply to the direction of load must be observed.

In many cases, the angle of the load will cause a decrease in the working load limit of the component in excess of 50%. Remember that the loudspeaker rigging hardware system is only as strong as the

(Continued on page 24)