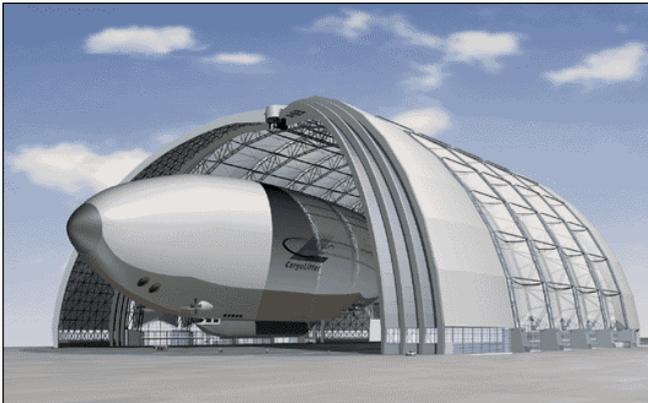


## Cargo Lifter prototype test

One of the most challenging applications performed with  $\mu$ -MUSYCS was the testing and evaluation of an airship prototype. The new design and sheer size of the future CL160, a 160m long balloon structure using the LtA (Lighter than Air) principle, are fascinating and impressive enough to drive engineers wild.



The CL 160 in a video animation

The main reason for CARGO LIFTER to use imc technology is that it offers them a flexible and powerful measurement system.

Two  $\mu$ -MUSYCS units meet the requirements. Packed in a special, very light, 19" rack mounting kit, each system works as a stand-alone system. A built-in GPS real time converter performs the time synchronization for both systems. In addition to that, the GPS signals will also be used to determine the position of the airship.

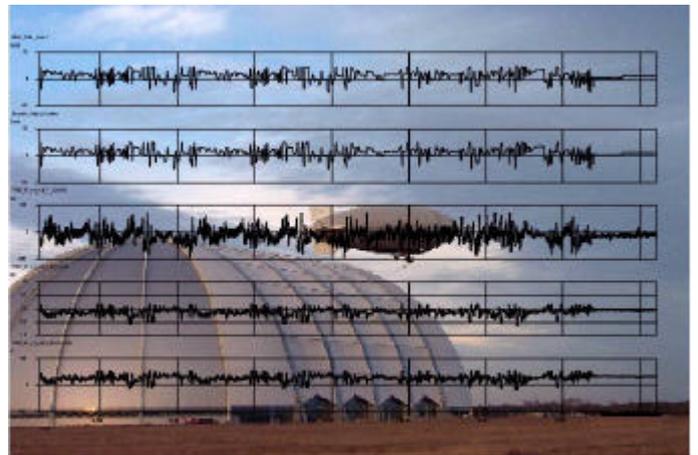
A laptop computer or an external imc  $\mu$ -MUSYCS display can be used for visualization purposes. A further requirement was synchronization of the CAN-bus with the ARINC-bus data and the incoming analog signals. For that purpose,  $\mu$ -MUSYCS offers to the Cargo Lifter engineers the best solution. The built-in interfaces allow not only synchronization between analog and bus data but also the ability to subject different channels jointly to online calculation with the help of Online FAMOS.

The functionality of Online FAMOS plays a very important role in the overall project. The demands for online calculation and online processing in general are very high during the tests. So  $\mu$ -MUSYCS not only measures every small movement and change inside the airship. It also performs a variety of calculations. get the status of the entire flight system.

Quantities measured include

- Temperature (air and gas)
- Pressure (air and gas)
- Motor rpm, Wind speed
- Stress, Force
- Angle, Weight
- CAN/ARINC data from the flight control system

The two systems are equipped with 10 M/DCV-4 DC bridge amplifiers as well as 3 M/TF-4 carrier frequency bridge amplifiers. Further conditioners for incremental encoder signals and voltage signals are implemented. To make the system running inside the airship each  $\mu$ -MUSYCS unit is equipped with a 9...36 V DC uninterruptible power supply as well as a 500 Mbyte storage.



Original measurement data from the test airship Joey

The printouts above show some signals recorded with  $\mu$ -MUSYCS. Measured signals such as elevator or rudder position in relation to side stick position, pitch (alpha) or yaw (beta) etc. are vital to validate theoretically calculated data. Furthermore, actuator forces and torque signals can be seen. The plotted curves serve to find a correlation between flight test data and flight test notes. During the particular test shown above, about 60 channels were recorded.

After the measurement, all data will be adjusted offline with the imc analysis and evaluation program FAMOS. Afterwards the data will be given out to different departments of evaluation. ASCII / EXCEL files and printouts provide the flexibility for working together with other programs or illustrating particular signal forms.

