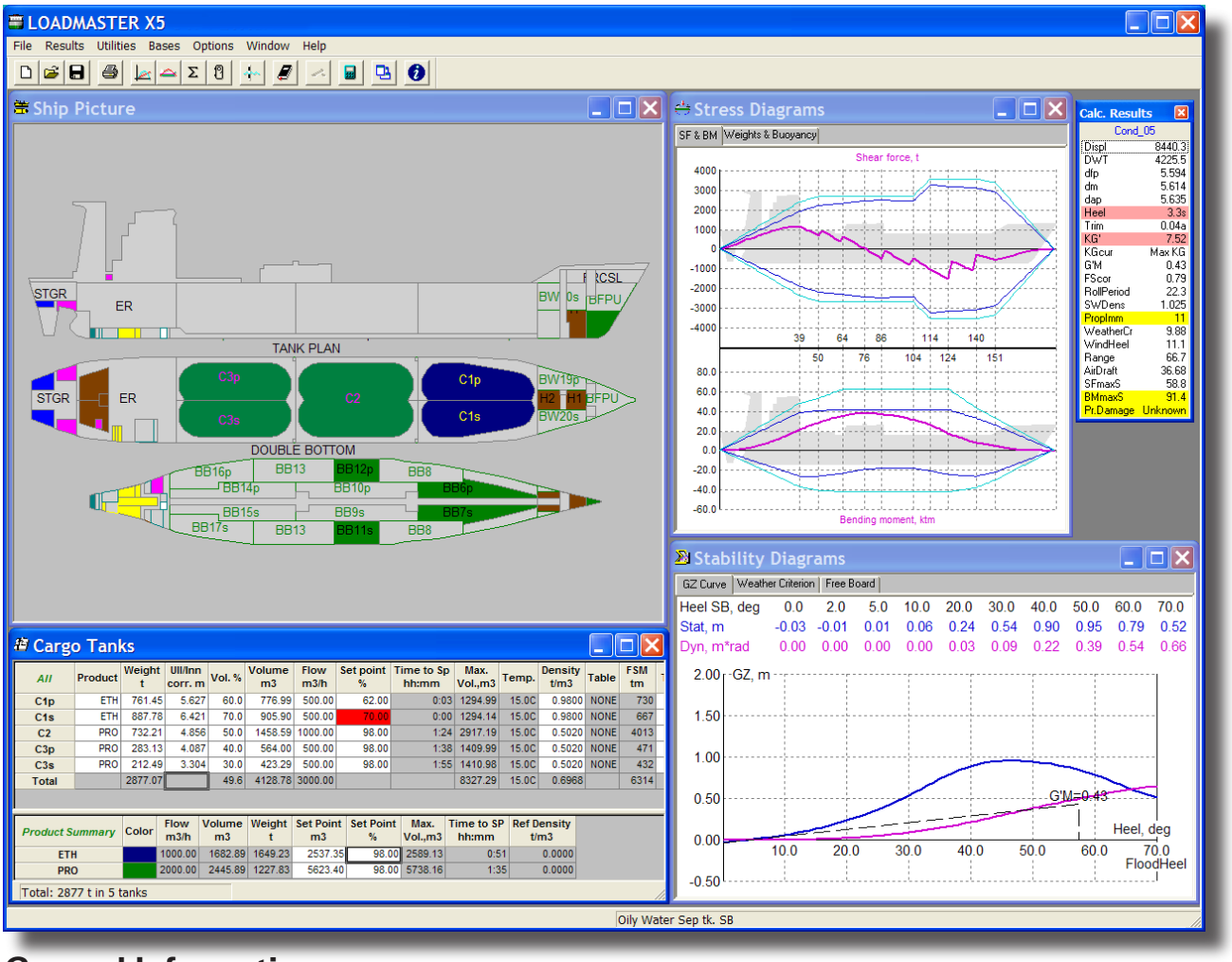
LOADMASTER® X5
LNG/LPG package



General Information

The LOADMASTER LNG/LPG Package offers a complete solution for your gas carrier. The program covers not only the necessary stability and strength calculations but also focuses on items that save time. Functions for making onboard operation painless has been our beacon when we developed the program.

Oil majors demand more and more documentation and LOADMASTER features automatic printouts of cargo/ballast/stability results in cycles.

The pump log is an integrated part of the system and includes facilities to accommodate several products as well as pump and manifold pressure.

The LOADMASTER offers an excellent user-friendly interface for new crew arriving onboard. In accordance with ISM-code it is essential to be able to start operation rapidly without compromising safety.

The LOADMASTER LNG/LPG Package includes a communication interface to the level gauging system on-board. Interfaces are made in house and the Kockum Sonics standard includes more than 40 of the world's level gauging vendors.

Today tankers are facing IACS UR L5 regulation. The rule dictates that the loading computer has to include an approved damage calculation module. Either through Min GM / Max KG curves or through a direct damage calculation module. LOADMASTER offers both alternatives. For a description of our direct damage calculation module, please study the corresponding datasheet.

LOADMASTER®

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Liquid Cargo Plan

The liquid cargo plan is an advanced tool for handling cargo. The grid allows manual input or automatic online communication to ship's level gauging system. As soon as one value is changed all other corresponding values are recalculated automatically.

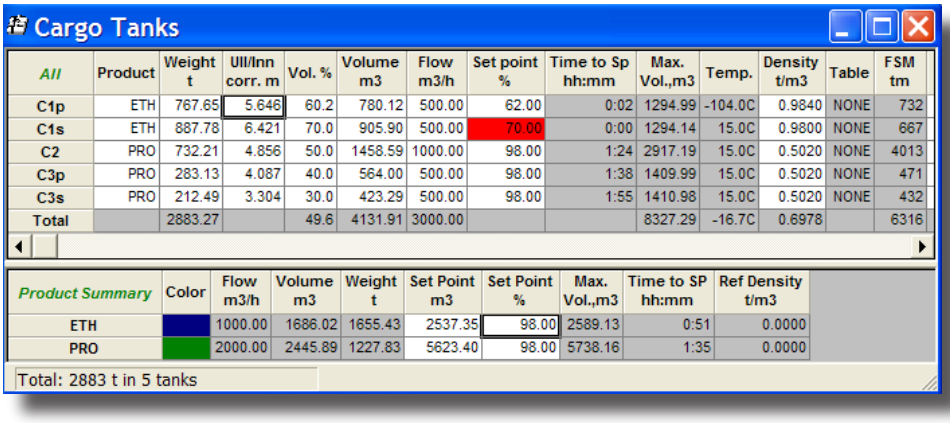
The liquid cargo plan presents each tank's details including Volume (%, m3, Bbls), weight (Tonnes, LT), Level (Ullage, Sounding), Density, Centre of Gravity (VCG, LCG, TCG), Product Details, Temperature (Centigrade, Fahrenheit) and more. The column order can be modified in order to accommodate the user's preferences. The user can easily make predefined layouts for US or metric units etc.

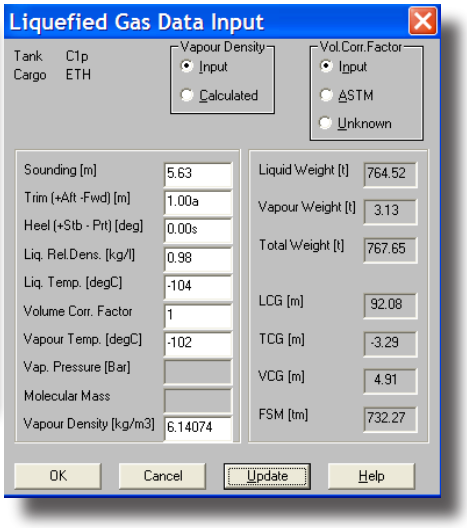
Liquefied Gas Data Input

The program has an input module for manually entering level, pressure and temperature measurements and automatically gets the corrected level values with respect to trim/heel, tape shrinkage and float buoyancy. Liquid and vapour weights are calculated.

Correction factor to obtain the volume at 15 C may be manually entered or calculated automatically, using ASTM Table 54. The relative density of the liquid is entered at the standard temperature 15 C in vacuum.

The density of the gas vapour may be manually entered or calculated from vapour temperature, vapour pressure and molecular mass of the gas





Product Summary

The Liquid Cargo plan grid has a summary portion. After the product in each tank has been defined, LOADMASTER constantly sum up volume, flow and weight for each product. An excellent tool for making intermediate reports to terminals.

Set Point

The user defines a certain set point for each tank. LOADMASTER calculates the time remaining until the set point is reached. Calculation is based on manually entered flow or online received level rate. The set point also appears in the product summary window. This gives the officer on watch a direct indication of remaining time of loading/discharging.

On-Line:

The LOADMASTER is very flexible in communicating with other systems. LOADMASTER can receive level, temperature, pressure etc from any gauging system available. In return we send the volumes, strength and stability results to the ship's automation system.

The LOADMASTER can also communicate with Hull Stress Monitoring Systems (HSMS) as well as Voyage Data Recorders (VDR). Communication can be via Serial Communication, Ethernet, File Sharing etc.

Tailormade solutions can be done on request.

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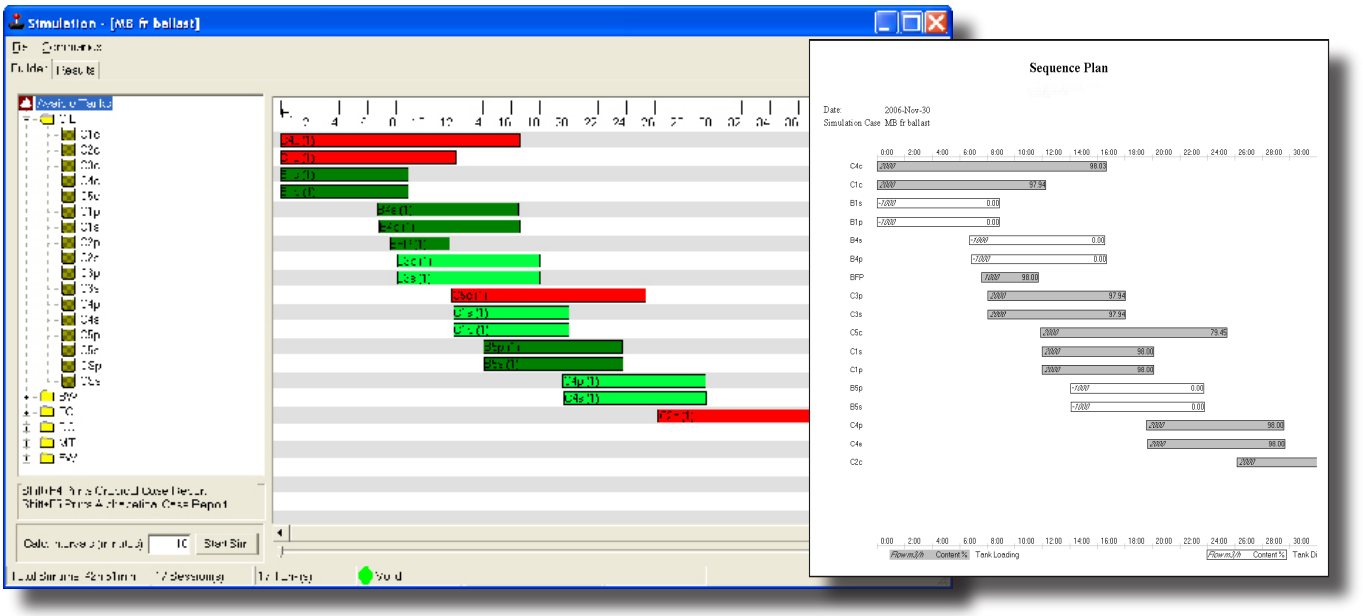
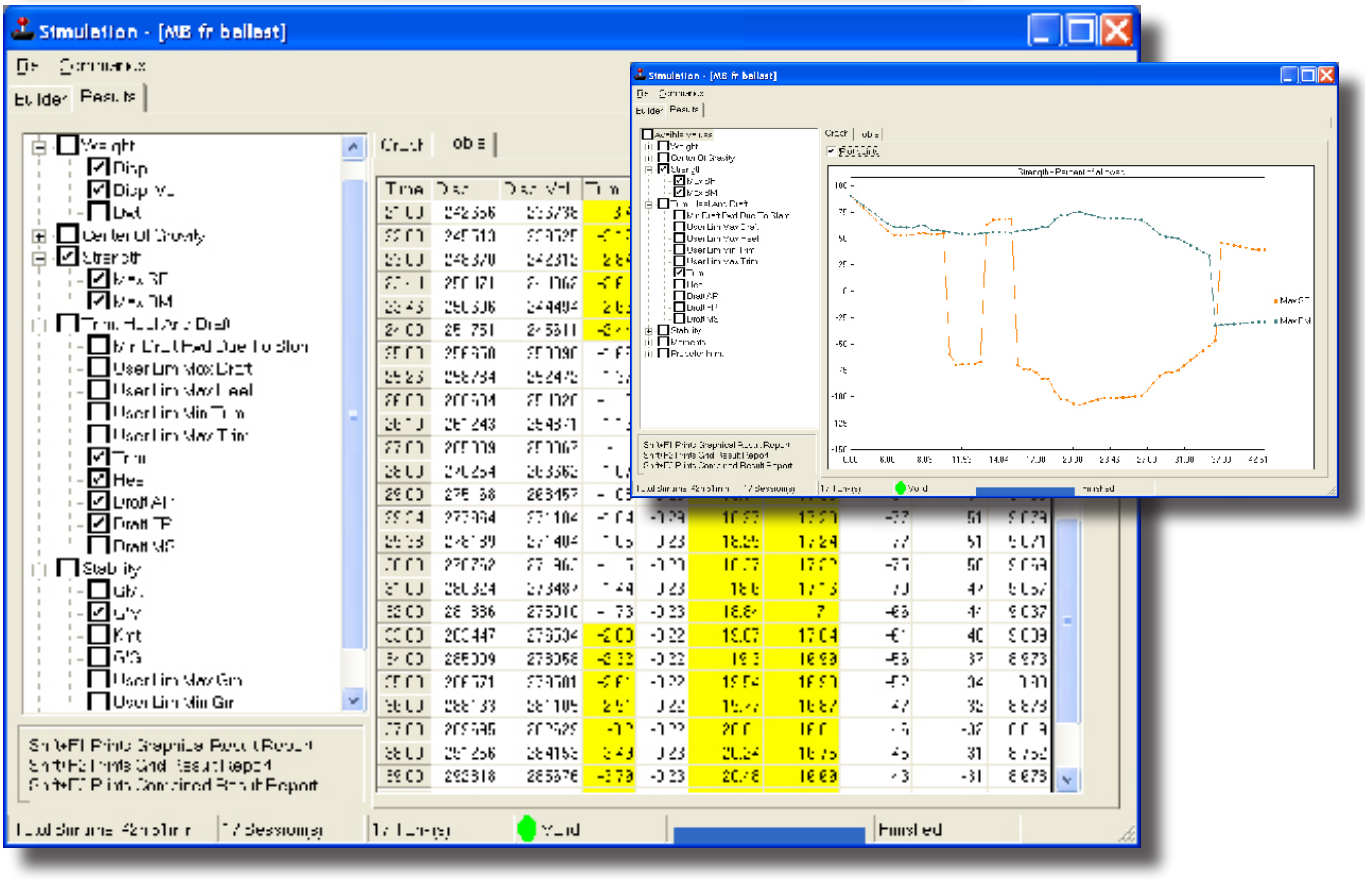
Simulation

For years the chief officer has struggled to get a proper work order to the crew. At least one that he knows does not result in critical situations with respect to strength and stability. LOADMASTER provides a state of the art graphical simulation. Today the officer can plan the loading/discharging sequence in a graphical mode easy to overview and modify. Tank bars are moved with the mouse and added/deleted from the work area via drag and drop functionality.

Calculations can be done over and over again until the most optimum sequence is found. When the sequence is optimized reports are generated by a click of the mouse. The simulation reports can be graphical or table based and come as work orders and also documents the results obtained from the LOADMASTER during the sequence i.e. weight, G'M, SF, BM etc all in compliance with oil major's requests.

Simulation reduces turn around times in ports and at the same time ensures that safety is not compromised. An investment with payback time calculated in hours.





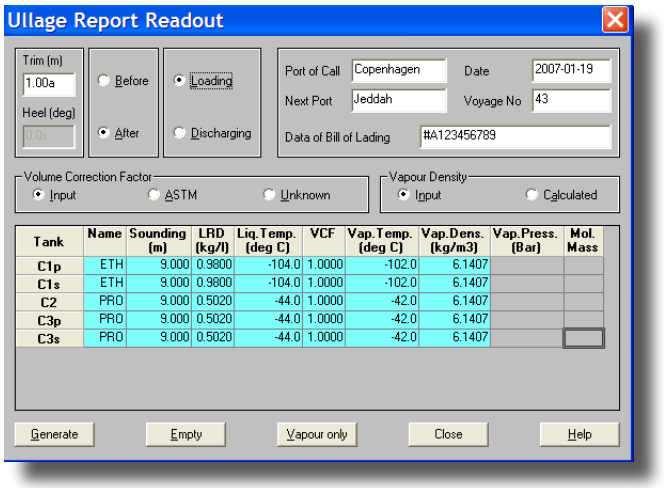
Functional description

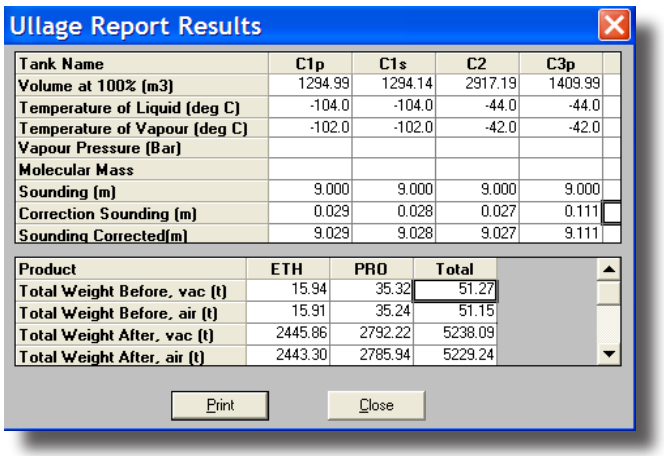
Pump Log

The pump log handles the presentation of the pumping sequence for one or more products. Rate, quantity and local time/date will be recorded automatically. The user has the opportunity to customize the interface to the present situation.

The module is able to handle functions such as approximate time to completion (ETC). Shore/Ship stop as well as other information that are relevant in a pump log can be entered and the pump log can be printed as hard copy.

The pump log is able to handle a variety of reports that are used by ship, terminal, cargo surveyors, oil majors etc.





Automatic Report

Oil majors demand more and more documentation. In the LOADMASTER you can have automatic printouts of cargo/ballast/stability results in user defined cycles. Preview of reports is available before printing.

Elevation of Point

LOADMASTER has a very practical feature for entering any point on the vessel and immediately gets its vertical distance above the water line calculated. The user can define points such as manifold and gangway etc.

Ullage Report (LNG/LPG)

The Ullage Report for liquefied gas carriers calculates the weight of loaded or discharged liquefied gas and its vapour. It is intended to be used during the survey operation of loaded or discharged cargo.

The calculation may be performed:

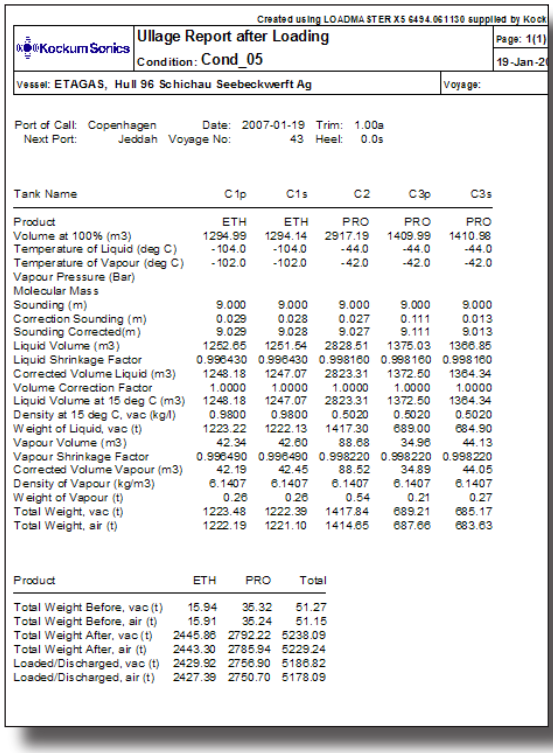
Before loading
After loading
Before discharge
After discharge

Liquefied Fraction Calculation
Initially observed drafts and list are entered for the vessel. From the manually gauged soundings and the cargo temperature of the liquid, a corrected sounding is calculated taking "tape shrinkage", "float buoyancy" and trim/heel into consideration.

Vapour Fraction Calculation
The vapour volume is calculated from the total volume of the tank and the volume of the liquid fraction. Tank shrinkage is also considered during the calculation. The density of the gas can be manually entered or calculated from vapour temperature, vapour pressure and molecular mass of the gas.

Summary Calculation
For each tank the total weight of liquid and vapour in vacuum and in air is calculated. After loading or discharge the total weights per loaded/discharged product is calculated.

The results of the calculations above are displayed on screen and can be printed as hard copy.


Created using LOADMASTER X5 6494.061130 supplied by Kock

Kockum Sonics — Ullage Report after Loading — Page: 1(1)
Condition: Cond_05 — 19-Jan-2
Vessel: ETAGAS, Hull 96 Schichau Seebeckwerft Ag — Voyage:

Port of Call: Copenhagen Date: 2007-01-19 Trim: 1.00a
Next Port: Jeddah Voyage No: 43 Heel: 0.0s

Tank Name	C1p	C1s	C2	C3p	C3s
Product	ETH	ETH	PRO	PRO	PRO
Volume at 100% (m3)	1294.99	1294.14	2917.19	1409.99	1410.98
Temperature of Liquid (deg C)	-104.0	-104.0	-44.0	-44.0	-44.0
Temperature of Vapour (deg C)	-102.0	-102.0	-42.0	-42.0	-42.0
Vapour Pressure (Bar)					
Molecular Mass					
Sounding (m)	9.000	9.000	9.000	9.000	9.000
Correction Sounding (m)	0.029	0.028	0.027	0.111	0.013
Sounding Corrected(m)	9.029	9.028	9.027	9.111	9.013
Liquid Volume (m3)	1252.65	1251.54	2828.51	1375.03	1366.85
Liquid Shrinkage Factor	0.996430	0.996430	0.998160	0.998160	0.998160
Corrected Volume Liquid (m3)	1248.18	1247.07	2823.31	1372.50	1364.34
Volume Correction Factor	1.0000	1.0000	1.0000	1.0000	1.0000
Liquid Volume at 15 deg C (m3)	1248.18	1247.07	2823.31	1372.50	1364.34
Density at 15 deg C, vac (kg/l)	0.9800	0.9800	0.5020	0.5020	0.5020
Weight of Liquid, vac (t)	1223.22	1222.13	1417.30	689.00	684.90
Vapour Volume (m3)	42.34	42.50	88.68	34.96	44.13
Vapour Shrinkage Factor	0.996490	0.996490	0.998220	0.998220	0.998220
Corrected Volume Vapour (m3)	42.19	42.45	88.52	34.89	44.05
Density of Vapour (kg/m3)	6.1407	6.1407	6.1407	6.1407	6.1407
Weight of Vapour (t)	0.26	0.26	0.54	0.21	0.27
Total Weight, vac (t)	1223.48	1222.39	1417.84	689.21	685.17
Total Weight, air (t)	1222.19	1221.10	1414.65	687.66	683.63

Product	ETH	PRO	Total
Total Weight Before, vac (t)	15.94	35.32	51.27
Total Weight Before, air (t)	15.91	35.24	51.15
Total Weight After, vac (t)	2445.86	2792.22	5238.09
Total Weight After, air (t)	2443.30	2785.94	5229.24
Loaded/Discharged, vac (t)	2429.92	2756.90	5186.82
Loaded/Discharged, air (t)	2427.39	2750.70	5178.09

Subject to alteration without notice.

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