

LIST OF MULTILOAD OPTIONS

MULTILOAD BASE PROGRAM FEATURES

- Fleet Based Program for Office Use
- Direct Damage Stability Module (according to MARPOL 73/78 Annex 1 Reg. 28 and IBC Code Chapter 2)
- On-Line Help Utility in Every Screen
- Import/Export of Loading Conditions by e-mail
- Different colors for different cargo types
- Full Stability, Trim, Drafts, Longitudinal and Torsional Strength Analysis/ Electronic
- Dead Weight Scale
- Max. Allowable Shear Force & Bending Moment Values (Seagoing, Port, Alternate Loadings etc.)
- Shear Force & Bending Moment Diagrams on Screen
- Automatic Shear Force Correction (if Applicable)
- Automatic Selection of Stability Criteria
- Plimsoll Marks and Port Draft Restrictions / Fwd. Draft Restriction for heavy weather
- Easy Cargo Definition / Stowage Factors (Metric-British Units). Cargo Tanks
- Loading by Weight, Percentage (%), Ullage or Level
- Warning for Sloshing Effect in Tanks
- Automatic Cargo Distribution
- Optimum Capacity Utilization of Cargo Tanks
- Autotrim
- Cargo Split and Autotrim (divide a cargo quantity between two compartments and also reach a required trim)
- Viewing Details of Dead Weight items [Bounds, Volume, V.C.G., L.C.G., Max. Tank Top Strength, Tank Top Areas etc.]
- Air Draught Calculation from Radar Mast / Propeller Immersion / Visibility Check
- Detailed Printed Reports of Loading Conditions, Main Ship Particulars, Max. Allowable Shear Force, Bending and Torsional Moments
- Detailed Tanker Loading
- Autoload

SPECIAL MULTILOAD OPTIONS

- Air Draft Calculation from manifolds
- Departure – Arrival Calculation
- Real Time Tanker Loading
- Vessel List Calculation
- Cargo Compartment Group Definition
- Cargo Assignment Into Groups
- Ship Loading plan on screen (ship graphics)
- Ship's Girder Deflection and Deadweight Gain or Loss
- Real Time Tanker Loading with sensors (Online-Module)
- Oil Cargo Transfer with report
- Variable VCG and FSM (for tanks other than cargo tanks)
- Ship's Squat/Speed Loss at Restricted Waters & Static Condition from Dynamic Drafts
- Bunker Survey Program

SHORT DESCRIPTION OF SPECIAL MULTILOAD OPTIONS

◆ Air Draft Calculation From Manifolds

This MULTILOAD Option presents on screen the air drafts from each manifold. Additionally there is a custom point where you can input any of its coordinates and obtain the Air Draft for the current loading condition. The same option prepares a printed report with Air Draft Information.

◆ Departure - Arrival Calculation

A unique tool for instant creation of Arrival Condition from the Departure or visa versa. *Ideal for Panama Canal Transit.* Automatically takes into account voyage miles, speed, consumption, ROB's, desired safety margins, FO, DO, and FW tank capacities and consumption sequences as well as any bunkering operations.

◆ Real Time Tanker Loading

This Option is applicable for Loading or Discharging. Given the Loading/Discharging Rates MT/Hour, MULTILOAD will load/discharge groups of Tanks that you select and generate in a few minutes a list of Ship Drafts, Total Cargo, Strength, Stability, Trim, Propeller Immersion and Air Drafts against time (in 10 minutes internals).

At the end of this report there will be a list of the extreme values of the above mentioned parameters and at what time those will take place.

◆ Vessel List Calculation

This MULTILOAD Option calculates and prints on screen and in the MULTILOAD Print Out the ships list or heel in degrees for every intact loading condition that is calculated.

◆ Cargo Compartment Group Definition

When you first run MULTILOAD on your computer, you have to define the Cargo Compartment Groups that will be used in the Cargo Assignment Into Groups function.

You can define which compartments belong to each group, the filling sequence and the filling method to be used.

Filling Sequence defines the order that the compartments of each Group will be loaded. Equal Filling Sequence numbers denotes that the compartments will be loaded symmetrically.

◆ Cargo Assignment Into Groups

With this MULTILOAD function you can calculate the Vessel Utilization Factor (100% V.U.F. means that all cargo loaded occupies 100% of the assigned compartments) for every combination of Cargo Type and Cargo Compartment Group. It is especially useful for Tanker Loading where we have cargo tank groupage. In this screen you can also see the cargo left out. For each cargo group, you can select between two filling methods: Leave Last Slack (which loads all the compartments up to 100% full, leaving the last one slack) and Even Distribution, which loads the compartments evenly (the same percentage to full).

This Option is applicable for Loading or Discharging. Given the Loading/Discharging Rates MT/Hour, MULTILOAD will load/discharge groups of Tanks that you select and generate in a few minutes a list of Ship Drafts, Total Cargo, Strength, Stability, Trim, Propeller Immersion and Air Drafts against time (in 10 minutes internals).

◆ Autoload

Autoloading Will Be An Indispensable Tool For Your Chartering Department.

This is the most powerful MULTILOAD-Option. The AUTOLOAD Option does all the work of ship pre-loading calculation for you.

AUTOLOAD uses a powerful Artificial Intelligence (AI) routine that maximizes the Vessel Utilization Factor, given the cargo weight to be loaded and a set of operational constraints (100% V.U.F. means that all cargo loaded occupies 100% of the assigned compartments). It automatically distributes the cargo while keeping all other requirements within permissible values, if this is possible. Alternatively, if the restrictions set by the user are contradictive, then MULTILOAD will try to establish a solution that will meet some but not all of the constraints. In this case a feasible solution can be obtained by adjusting the cargo to be loaded values accordingly.

◆ **Ship Loading Plan on screen**

With this MULTILOAD Option you get a graphical representation of the ship with all Deadweight Items shown on profile and plan views.

You may also see the percentage full for each Compartment/Tank in representative color. In the Plan View of the Vessel, partially loaded compartments are partially painted in left-to-right direction, according to percentage.

Finally you can scroll through the Compartments and Tanks and view their content details.

A blue line denotes the ship current Water Line.

If the SF & BM Diagram to the Ship Loading Plan Option is available, press the switch button to change from Ship Loading Plan on Screen and back.

If you would like to switch to a big view of the Plan press the maximize button or double click on the Plan's title. Press the restore button to switch back to normal view and continue your loading.

◆ **Oil Cargo Transfer with Report**

Oil Majors require that during Oil transfer the vessel must report Draft, Stability and Strength Results at hourly or 2-hourly time intervals.

This ML Option keeps record of all basic results during oil transfer based on Observed Ullages, Cargo Temperature, Trim and List and prints the results in a report as required by your ISM or ISO System.

◆ **Real Time Tanker Loading with Sensors**

This option allows **real-time monitoring of your vessel's loading condition, via sensors installed in your vessel's compartments.** It requests cargo data from each compartment (namely *Ullage* and *Average Temperature* for oil cargo and *Innage* for water ballast), calculates current weight based on said data, performs all the necessary checks and provides Multiload results.

It also performs a **Forecast** check on the Loading Condition (how will it be affected over a specific amount of time, given that the current weight changes continue at the same rate).

At all times the **SF & BM Diagram** along with the **Ship Loading Plan** (where applicable) will reflect the **current state** of your vessel's Loading Condition. If you wish to stop the operation you have to click the **Stop Online** button. Note that you will have to wait for all compartments to be accounted for before the **Exit** button becomes available.

◆ **Variable VCG and FSM (for tanks other than cargo tanks)**

Multiload base program offers variable VCG & FSM for all cargo compartments. For the case of Fuel, Diesel, Lub, and Water Ballast Tanks Multiload base program considers the Max FSM between 0 - 98% filling percentages and outside this range assumes FSM nil.

The value of VCG is taken as the Volumetric VCG of each tank.

Above consideration is fully justified assuming that the ship's consumption is such that only one or a pair of Tanks (P&S) is at any one time in use.

However there are cases where the geometry or the size of such tanks makes it necessary to have some Tanks described in MULTILOAD with variable VCG & FSM.

◆ **Ship's Squat/Under Keel Clearance/Speed Loss at Restricted Waters & Static Condition from Dynamic Drafts**

By predicting the maximum ship's squat for a given situation, the advantages that can be gained are numerous, from saving the cost of a very large repair bill to even extra earning capacity.

With this unique Option, you can have calculated your ship's squat in several speeds, as well as the under keel clearances, the speed loss in restricted waters and your vessel's static condition from dynamic drafts. This Option is based on the over than 36 years experience and research of Dr. Bryan Barrass (UK). Through our company, in cases of incident involving squat, Dr. Bryan Barrass is also available as expert witness.

Bunker's Survey Program

With this option the user can record bunker quantity measurements at every voyage, can instantly recalculate the quantities received from the barge, and also can calculate the FO/DO reports in order to monitor the bunkers ROB.

The program includes ship's FO/DO Sound/ Ullage Table and Trim/Heel corrections.

◆ Ship's Girder Deflection and Deadweight Gain or Loss

This special Multiload function apart from the typical Girder Deflection due to longitudinal Bending Moment incorporates the thermal deflection at midships due to air-sea water temperature difference, generating the draughts of deflected vessel. This is especially important when navigating at Plimsoll marks in cold waters (e.g. North Atlantic) with sun. In this condition the Hogging of the Hull is increased (or the Sagging is reduced) as the deck is warmed up with the sun radiation.

Yours faithfully,
For SMM UK Ltd.

Sales Department

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