

# Chapter 16: RFID Analysis

## Introduction

This chapter introduces the basic functions of the RFID location optimizer, an **upcoming** new feature in TOPS Pro. We will illustrate how the RFID optimizer works and how to optimize pallet patterns for maximum RFID readability.

To use RFID optimizer, first create a Shipcase → Pallet analysis as described in earlier chapters of the User Guide. In this example, we'll use the following parameters:

- ❖ **Shipcase Length (in):** Enter 16
- ❖ **Shipcase Width (in):** Enter 10
- ❖ **Shipcase Height:** Enter 10
- ❖ **Pallet:** Use the default GMA (Notched)

If you have the TOPS Pro version which supports RFID Analysis, you will have the solution view with two extra function buttons as shown below:

The screenshot displays the TOPS Pro software interface. The main window shows a 3D model of a pallet loaded with red and yellow cases. The dimensions of the pallet are 42.00 (width) x 50.00 (depth) x 55.00 (height). The interface includes a menu bar (File, Edit, View, Define, Tools, Export, Supervisor, Help) and a toolbar. The 'UnitLoad View 1 of 37' window is active, showing a detailed view of the pallet. The 'UnitLoad List' window is also visible, displaying a table of unit load data.

Sol	Case Wgt	Vol (ID)	Board Area	Dim Vert	Len	UL Wid	Hgt	UL Wgt	Ptm Type	Cases /Layer	Layers /UL	Cases /UL	Area Eff	Cubic Eff
1	0.000	0.825	7.22	H	50.00	42.00	55.00	65.0	B	13	5	65	108.53%	108.21%
2	0.000	0.825	7.22	H	48.00	40.00	55.00	65.0	C	12	5	60	100.00%	98.04%
3	0.000	0.825	7.22	H	48.00	42.00	55.00	65.0	T	12	5	60	100.00%	98.04%
4	0.000	0.825	7.22	H	50.00	42.00	55.00	65.0	T	12	5	60	100.00%	98.04%
5	0.000	0.825	7.22	H	48.00	42.00	55.00	65.0	T	12	5	60	100.00%	98.04%
6	0.000	0.825	7.22	H	50.00	42.00	55.00	65.0	W	12	5	60	100.00%	98.04%
7	0.000	0.825	7.22	H	50.00	36.00	55.00	65.0	B	11	5	55	91.67%	89.87%
8	0.000	0.825	7.22	H	50.00	42.00	55.00	65.0	D	11	5	55	91.67%	89.87%
9	0.000	0.825	7.22	H	48.00	40.00	55.00	65.0	T	11	5	55	91.67%	89.87%
10	0.000	0.825	7.22	H	48.00	40.00	55.00	65.0	T	11	5	55	91.67%	89.87%

- ❖ **Sort by RFID Button:** Sorts the unitload solutions according to the amount of RF blockage, from the least to the greatest.
- ❖ **RFID Button:** Takes the current pallet pattern and displays it in the RFID Dialog Box. Here you can select various options regarding the location and placement of the RFID tags on the shipcases. You also have the option to rotate shipcases within the pallet pattern to maximize RF readability.

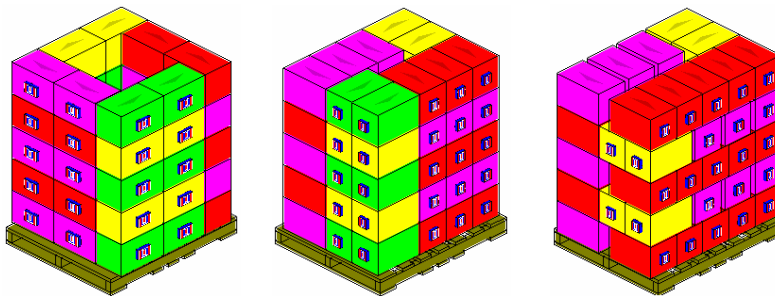
## Sort by RFID

To obtain the best pattern for RFID tag placement (on shipcases), click on the “Sort by RFID” button. This will add an extra (last) column of statistics to the UnitLoad List pane with heading **RFID Factor**. The unitload solutions are sorted such that patterns with the least RFID blockage will appear on the top of the list.

The letter in brackets to the right of the RFID factor represents the shipcase face on which the tag is located. This will be the face where the tag will have maximum readability. The percentage (%) represents the maximum amount of blockage that a shipcase in the current pattern would have using the default values.

(F) – Front                      (L) – Left                      (T) – Top  
 (B) – Back                      (R) – Right                    (BT) – Bottom

The top 3 solutions will appear as below:



Sol	Case Wgt	Vol (ID)	Board Area	Dim Vert	UL Len	UL Wid	UL Hgt	UL Wgt	Pttn Type	Cases /Layer	Layers /UL	Cases /UL	Area Eff	Cubic Eff	RFID Factor
25	0.000	0.825	7.22	H	50.00	36.00	55.00	65.0	T	10	5	50	83.33%	81.70%	0.00%(L)
27	0.000	0.825	7.22	H	46.00	36.00	55.00	65.0	W	10	5	50	83.33%	81.70%	0.00%(L)
36	0.000	0.825	7.22	H	42.00	42.00	55.00	65.0	W	8	5	40	66.67%	65.36%	0.00%(F)

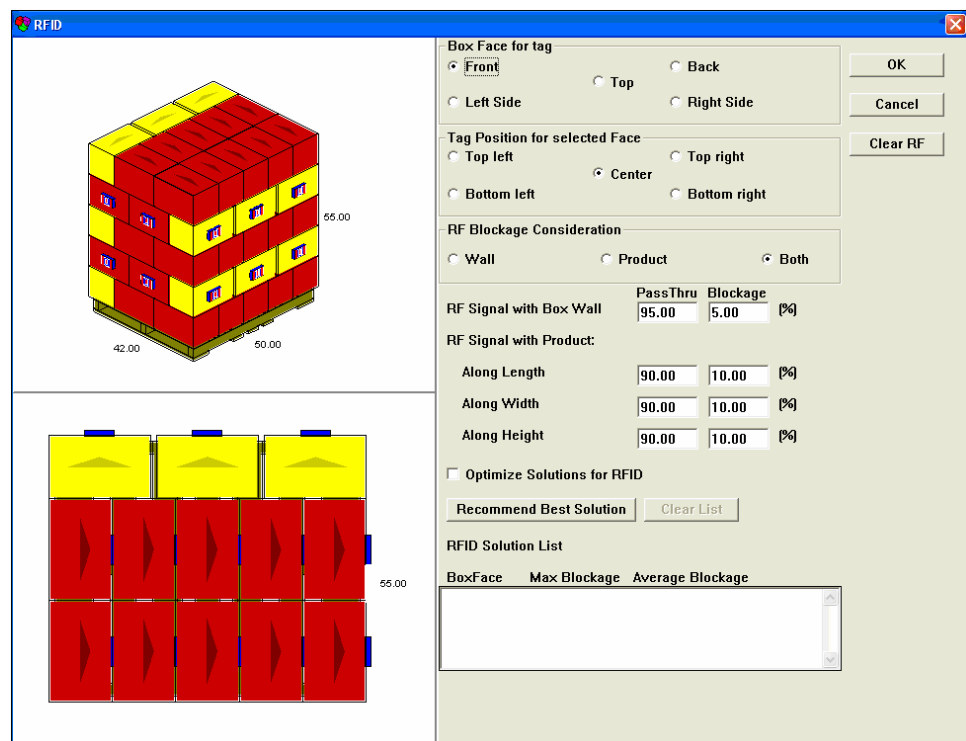
Notice that the 3 solutions all have a RFID factor of 0%, meaning that none of the RFID tags on the shipcases are obstructed from the scanner. To get back to your original sort order, click on the “Sort by Eff” (Efficiency) button in the unitload view pane.

# RFID Dialog Box

The RFID button leads to the functionality which optimizes placement of RFID tags for an existing pallet pattern.

To illustrate this function, we use the first unitload solution in the current analysis. To do so, make sure you highlight the first solution and click the RFID button in the unitload view pane. The RFID Dialog Box, as shown below, opens.

**Note:** The small dark rectangles in the Unitload Plan View at the bottom represent the RFID tags.



The following list gives a brief overview of the different options in RFID:

- ❖ **Box Face for tag:** Click the radio button to specify the shipcase face where the tag will be placed.
- ❖ **Tag Position for selected Face:** Click the selection as to where on the selected shipcase face the tag will be placed.
- ❖ **RF Blockage Consideration:** Click the selection to specify the blockage factor which TOPS Pro should consider when placing RFID tags: product, the box or both.

- ❖ **RF Signal with Box Wall:** Enter an estimate in percentage (%) the amount of RF pass through or blockage imposed by the walls of the shipcase.

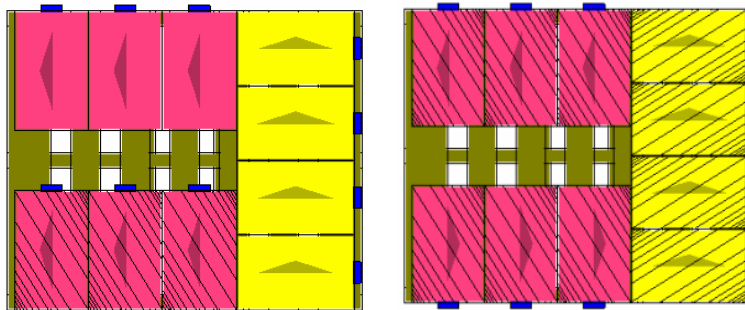
**Note:** You will need to enter only one of the two values, the other percentage will be populated automatically based on a total of 100%.

- ❖ **RF Signal with Product:** Enter an estimate in percentage (%) the amount of RF blockage imposed by the contents inside the shipcase along the Length, Width and Height of the shipcase.

**Note:** You will need to enter only one of the two numbers for each line, the other percentage will be populated automatically based on a total of 100%.

- ❖ **Optimize Solutions for RFID:** If checked, this option enables rotation of shipcases on the current pallet pattern by 180 degrees to obtain the most visibility to the RFID tags.

The illustrations below show how optimizing the solution by rotating the three shipcases on the bottom left by 180 degrees cuts average RF blockage from 6% to 0%.



- ❖ **Recommend Best Solution:** Click this button to have TOPS Pro start RFID tag optimization based on the options selected above for the current pallet pattern. The results are displayed in the RFID Solution List.
- ❖ **RFID Solution List:** Displays the list of RFID tag placement solutions, sorted by the amount of RF blockage.

BoxFace	Max Blockage	Average Blockage
Left Side	20.00 %	6.00 %
Right Side	20.00 %	14.00 %
Front Face	40.00 %	20.00 %
Back Face	40.00 %	24.00 %
Top Face	80.00 %	40.00 %