

GRAPH/NET Computer Integrated Design System

OPTI/NET Layout Optimization

Version 5.B

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## OPTI/NET Layout Optimization

### Introduction

The OPTI/NET program enables the designer to rapidly develop several alternative block layouts for a group of spaces, and to determine how well each layout meets a set of adjacency criteria specified for the spaces by the designer.

Input to the OPTI/NET program may be taken from a database, holding details about a set of spaces for a given project, or the designer may enter this information directly at the keyboard. The designer, with his client, can then detail the desired adjacency between each pair of spaces - generally on the basis of the functional relationships between the spaces. The adjacency values are chosen on a scale from 1 (Connected Spaces) to 6 (Isolated Spaces).

When values have been selected for all pairs, the computer mathematically solves the adjacency matrix to produce a bubble diagram, where each bubble represents a particular space. The diagram is the optimal solution to the criteria specified by the designer, as calculated by the OPTI/NET program. This diagram can be manipulated by the designer to achieve a desired orientation. The OPTI/NET program then converts the bubbles into block rectangles.

These rectangles are drawn to scale, using the dimensions specified for each particular room. The designer can then move and rotate the spaces to achieve an architectural solution to the design problem.

He then requests that a check-up matrix be displayed, to indicate where the layout does not meet the optimal adjacency criteria calculated earlier. The designer may then either re-work his layout, to correct those flaws he deems serious, or he may store that layout away for later recall.

Alternative layouts of a single group of spaces may be stored in the computer, or transferred into the DRAFT/NET program for further detailing.

The designer may use the OPTI/NET programs at several different stages in the development of schematic designs. He may optimize the arrangement of macro elements, such as major building components, entries, and parking, on the site. He may lay out departments in relation to each other, or the individual spaces within a single department. He may even, for technologically complex spaces, optimize the arrangement of equipment and furniture within a single room.

The OPTI/NET program assists the designer to determine those layouts which best meet an individual client's needs and style of operating. It assists the client in understanding how a design is developed, and provides a forum for his input into the design process.

## OPTI/NET Layout Optimization

### Starting Up

To get into the OPTI/NET program set, you must first make sure that you are working in the OPTINET area of the disk. If you start the program but are not in the proper disk area, OPTI will not be able to find any files you may wish to recall from earlier worksessions, and files you store away now will not be found later. To get into the OPTINET area of the disk, type the following command on the keyboard and then hit the RETURN key. (Note: you should already have turned on the computer, entered the date and time if necessary, and logged in.)

```
PATH :OPTINET
```

The computer will respond with a message telling you that a new path has been set, so that any files created now will be stored in the OPTINET area.

Now, tell the computer that you wish it to run the OPTI/NET program. You do this by typing the following command on the keyboard, and then hitting the RETURN key.

```
OPTI
```

The screen will then go blank, and the OPTI/NET menu and display windows will appear. At this point the Menu Windows will be blank. In the Dialogue Window you can see the version number of the program; this identifies the software release with which you are working. Always include this version number in any communications with GHI, either to report bugs or to suggest changes in the program. The current version is number 5.B.

Also displayed in the Dialogue Window is the following message:

```
Please enter designer initials.
```

Type your initials and then hit the RETURN key on the keyboard. Your initials will be stored in the file to identify its creator

## OPTI/NET Layout Optimization

When you have entered your initials, the OPTI/NET Master Menu will appear on the screen. The Master Menu offers you a choice of seven options:

- DataBase
- Matrix
- Layout
- Check Up
- Plot
- Save/Retrieve

Exit OPTI/NET

These commands are shown on the screen in the order in which you might typically use them, with a couple of exceptions, which will be discussed below. The following paragraphs will discuss in turn each of these options, and any sub-menus each may use. In order to make a selection from this or any menu, slide the puck over the surface of the workstation until the black bar is positioned over the option you wish to select. Then press down the yellow button on the puck. That registers your selection, and results in the appearance of the appropriate sub-menu.

## OPTI/NET Layout Optimization

### DataBase

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To commence the development of a layout for a group of spaces, you should select the DataBase option from the Master Menu. Slide the puck up and down in the Master Menu area until the black bar is positioned over the DataBase option, and then press down the yellow button on the puck. This will cause the OPTI/NET DataBase Menu to appear in the Action Menu window. There are four options in the DataBase Menu:

Create New

Fetch Old

Save Database

Master Menu

**Create New:** If you do not have a space program stored on the computer, you may choose to type in on the keyboard the names and dimensions of the spaces you wish to lay out. When you choose the Create New option, the following message will appear in the Dialogue Window:

Project name:

Enter the name for the project on which you wish to work. Then hit the RETURN key on the keyboard. The following message will then appear in the Dialogue Window:

Department name:

Enter the name for the department of the project on which you wish to work, and then hit the RETURN key on the keyboard. If you do not wish to assign a name to the department, just hit the RETURN key. The following message will then appear in the Dialogue Window:

Group name:

Enter the name for the group within the department of the project on which you wish to work. Then hit the RETURN key on the keyboard. If you do not wish to assign a group name, just hit the RETURN key. The following message will then appear in the Dialogue Window:

## OPTI/NET Layout Optimization

DataBase, continued

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Room 1

.. Description

Enter the name of the first space on the keyboard, and then hit the RETURN key. Remember that the name may be up to 29 characters long, but only the first 8 characters will be displayed in the bubble and block diagrams. If you want to enter a short description and a full name, type the 8 character short name, a space and then the full name, which may be up to 20 characters long. You will then see the following message in the Dialogue Window:

.. Quantity

Type in the number of spaces of this type to be found in this group. You will then see the following message in the Dialogue Window:

.. Length:

Type in the length of the space at the keyboard, and then hit the RETURN key. Remember that the smallest increment allowed for the length and width is a foot - you must round off all dimensions which have inches. You will then see the following message in the Dialogue Window:

.. Width:

Type in the width of the space at the keyboard, and then hit the RETURN key. You will then see the following message in the Dialogue Window:

Room 2

.. Description:

Continue entering the names, quantities, lengths and widths of the spaces in the manner described for Room 1 above. When you have entered the width of the last space, the Dialogue Window will look like the following:

Room N

.. Description:

## OPTI/NET Layout Optimization

DataBase, continued

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To indicate to the OPTI/NET program that you have finished entering data, hit the RETURN key on the keyboard. The OPTI/NET program will then tell you how many spaces you have entered, displaying the following message in the Dialogue Window:

X rooms created

... Circulation %:

Enter the circulation factor that you wish to have added to the net spaces to produce the gross area. This should be a whole number, such as 35, 60, and so on.

If you make a mistake while typing in the room names, quantities, lengths and widths, you can only correct it BEFORE you hit the RETURN key. To do this, hit the BACK SPACE key until you have erased the error, then enter the correct value. After you have hit the RETURN key, you cannot correct an error, and you must exit from this data entry cycle and re-enter your data from the beginning. To do this, the next time that you see the following message in the Dialogue Window, just hit the RETURN key.

Room N

... Description:

Follow the steps outlined above, until you are returned to the OPTI/NET DataBase Menu. Select Create New, and re-enter your data, as described above.

After you have completed entering the database, OPTI will display it on the screen for you, showing the project, department and group names, each space, its quantity, length, width, the total net area, circulation percentage and area, and the total gross area. This display is for your information, to verify that you have entered the data correctly.

## OPTI/NET Layout Optimization

DataBase, continued

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**Fetch Old:** If you have a project Space Program which has been stored on the computer, you may choose to access that directly. When you choose this option from the menu, the following message will then appear in the Dialogue Window.

Please choose a File from the Menu

A menu of file names will appear under the cursor. If the file you wish to read is in that menu, simply point at it and press the button. If it is not, then it MAY be in a file directory contained within the current area of the disc. Any file directories will appear in the pop-up menu as NAME.DR. If you point at one of these, then a new menu, containing the Files in this directory will appear. You can then choose from this menu, if you see the file you require. To go back up one level of menus, or to exit from the first menu, simply move the cursor off the menu area and press the yellow button. If you exit from the first menu, then the OPTI/NET program will tell you it has failed to find the file, and you should choose the Fetch Old option again.

After a short pause, the contents of the space program that you have selected will be displayed on the screen. This is only a subset of the full database information held for the project.

**Save DataBase:** After you have typed in a database, you MUST save it on disk, otherwise you will have serious problems later when you try to recall the layouts developed from this database. (If you select Exit OPTI/NET without saving the database, the OPTI program will issue a warning to you.) When you choose this option, the following message will appear in the Dialogue Window:

What is the name for the database?

Enter the name for the database, and then hit the RETURN key on the keyboard. You will then see a message that your file has been saved as NAME.PDF. (You do not need to type the .PDF when you enter the database name.) If another file has already been stored on the hard disk with that name, you will see a message alerting you to this, and asking if you wish to overwrite it. If you choose to do so, this file will be stored under the name you just entered, and the file already on disk will be stored as NAME.PDF\$ - this enables you to recall it subsequently should this prove necessary.

## OPTI/NET Layout Optimization

DataBase, continued

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Master Menu: When you have either typed in or called up the group of spaces on which you wish to work, select the Master Menu option to move on to the next step in the OPTI/NET program. Selection of this option will return you to the Master Menu, so that you can make your next selection. Note that if you have not saved a Database that you have just created, the program will warn you and allow you the option to return immediately and do so.

## OPTI/NET Layout Optimization

### Matrix

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After the list of spaces to be laid out has been entered into the program, you must specify the optimal functional adjacency relationships for each pair of spaces. To do this, select the Matrix command from the Master Menu. When you choose this option, the OPTI/NET Matrix Menu will appear in the Action Menu window. There are ten options in the Matrix Menu.

- Fill In
- Expand Multip
- Solve
- Edit Matrix
- Edit Diagram
- Show Both
- Show Matrix
- Show Diagram
- Screen Dump
- Master Menu

**Fill In:** You must first enter the adjacency values for each pair of spaces. Choice of this option will cause the Data Value Menu to appear in the Action Menu window. The Data Value Menu has nine options:

- 1 (Connected)
- 2 (Adjacent)
- 3 (Close)
- 4 (Neutral)
- 5 (May Be Far)
- 6 (Isolated)
- REPEAT
- Autofill

--NO CHANGE --

You will also see that the names of the first pair of spaces are now displayed in the Dialogue Window. Choose a value from this menu. The value that you have chosen will be displayed next to the names of the pair of spaces in the Dialogue Window, and will be entered into the appropriate cell of the matrix. Then the names of the next pair of spaces will be displayed in the Dialogue Window. Select the optimal adjacency value for that pair in the same manner as the first. That value will appear in the Dialogue Window and be entered into the Matrix, and the next pair of spaces will appear. Continue until an optimal adjacency value has been selected and entered into the matrix for each pair of spaces.

## OPTI/NET Layout Optimization

### Matrix, continued

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If you wish to repeat all or part of a row of values, you may select the REPEAT option instead of one of the adjacency values. The values for each pair in that row will be displayed in the Dialogue Window, and will be entered into the matrix. You should not choose this option when entering the first row of spaces. If, however, you do so, then a value of 4(Neutral) will be assumed for the rest of that row, though this will not be displayed in the matrix.

If you choose the Autofill option then the values for the rest of the row that remains to be filled will be given a value of 4(Neutral). If you then wish to alter some of these values subsequently, you can use the Edit Matrix command.

The NO CHANGE option is intended for use at the Edit Matrix stage. It enables you to leave the current value for the pair unchanged. If used at the Fill In stage, then a value of 4(Neutral) will be assumed, although no value will be entered into the matrix cell.

When the matrix is completely filled in, you will hear a beep tone, and the Data Value Menu will be replaced by the OPTI/NET Matrix Menu. If you made an error in assigning adjacency values in the matrix, you should select the Edit Matrix option described below.

**Expand Multip:** If you have more than one of a given space or a room, you should split it apart in order to see separate rectangles in the Layout mode. When you choose the Expand Multip option, the display of the database on the screen is regenerated, and wherever the quantity of a space was greater than one, the space has been split into several iterations, identified by numbers. The OPTI/NET program automatically assigns a value of 4 (Neutral) to the relationship between multiple occurrences of the same space.

## OPTI/NET Layout Optimization

### Matrix, continued

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**Solve:** When the matrix has been entered correctly, select Solve to have the program produce the initial bubble diagram. When you choose the Solve option from the menu the OPTI/NET program will solve the matrix mathematically, and generate a bubble diagram that illustrates the best mathematical solution.

Note that this mathematical solution is not always a perfect one. If there are inconsistencies in the adjacency values you selected as optimal the program will not be able to resolve them, it will do its best. It is a good idea to ask for a Check Up Matrix at this point in the program, to see if you have done this. If there are inconsistencies in the values, you may wish to return to the Edit Matrix command, and change the values.

At this point, you may choose either to manipulate the bubble diagram, or to immediately convert it into scaled rectangles.

**Edit Matrix:** If you make a mistake entering the optimal adjacency value for a pair of rooms or spaces, make a note of those pairs which need to be changed, and then continue until the matrix is complete. Then select the Edit Matrix option from the Matrix Menu. When you choose this option a crosshair will appear on the screen. Move this crosshair until it is positioned over the incorrect value in the Matrix, and then press down the yellow button on the puck. The OPTI/NET program will signal which value you have selected by reversing it in the matrix, so that it now appears as a white number in a black diamond. At the same time, the names of the pair of spaces will be displayed in the Dialogue Window. Select the correct value from the Data Value Menu, which has now re-appeared in the Action Menu area. That value will be entered into the matrix, and the black diamond will be replaced by a smaller black square around the new value. This facility enables you to see which values you have changed in this edit. If you had more than one error to correct, repeat the entire process, indicating the incorrect value, and selecting the new value. After correcting all errors, move the cursor up into the Display area and then down into the Matrix Menu area. This will return you to the Matrix Menu.

Note that every time you choose the Edit Matrix option, you must Solve the new matrix, before you can edit the bubble diagram or perform any of the Layout options.

## OPTI/NET Layout Optimization

### Matrix, continued

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**Edit Diagram:** If you want to manipulate the bubble diagram, you should select the Edit Diagram option. This will cause the Edit Diagram Menu to appear in the Action Menu window. The Edit Diagram Menu has the following seven options:

- Compress
- Expand
- Mirror L/R
- Mirror T/B
- Rotate CCW
- Rotate CW
- Matrix Menu

**Compress:** The Compress option moves all of the bubbles closer together without altering the mathematical solution to the adjacency matrix. Pressing the yellow button on the puck, while it is positioned over the Compress option will cause the bubbles to move closer together. Press it down again to move the bubbles still closer together.

**Expand:** The Expand option moves all of the bubbles further apart, without altering the mathematical solution to the adjacency matrix.

**Mirror L/R:** The Mirror L/R option flips the bubble diagram over from left to right. Pressing the yellow button on the puck will flip the bubble diagram over, pressing it down again will flip the bubble diagram back to its original orientation.

**Mirror T/B:** The Mirror T/B option flips the bubble diagram over from top to bottom.

**Rotate CCW:** The Rotate CCW option rotates the bubble diagram ninety degrees in a counter-clockwise direction. To return the bubble diagram to its original orientation, choose this option four times.

## OPTI/NET Layout Optimization

Matrix, continued

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**Rotate CW:** The Rotate CW option rotates the bubble diagram ninety degrees in a clockwise direction.

**Matrix Menu:** The Matrix Menu option returns you to the OPTI/NET Matrix Menu when you have finished manipulating the bubble diagram in the above ways.

**Show Both:** Selecting this command will cause both the Adjacency Matrix and the Bubble Diagram to be displayed on the screen at once. If you wish to see only the Matrix or the Diagram, select the appropriate option below.

**Show Matrix:** Selecting this command will cause just the Adjacency Matrix to be displayed on the screen. This is useful before making a hard copy of the Matrix, especially if the Bubble Diagram is large enough to overlap onto it, making it unreadable.

**Show Diagram:** Selecting this command will cause just the Bubble Diagram to be displayed on the screen. This is useful before making a hard copy, especially if the Bubble Diagram is large enough to overlap onto the Matrix, making it unreadable.

## OPTI/NET Layout Optimization

Matrix, continued

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Screen Dump: If you want a hard copy of the Matrix and/or Bubble Diagram, you may select the Screen Dump option from the OPTI/NET Matrix Menu. When you select this option, you will be asked, in the Dialogue Window, to ensure that the printer is switched on and is on-line; having done this press the RETURN key. The project name, the date and time, and the designers initials will appear in the Dialogue Window, and the printer will start to produce the copy. To quit from the hard copy at any time; type 'q' to which the program will respond by putting a Quit Confirmation Window up in the center of the screen; you can then confirm the quit request by typing a 'y' - for Yes - or simply pressing the Return key. When the screen dump has been completed, or you have quit from it, you can make another selection from the Menu.

Master Menu: When you have finished entering optimal functional adjacency values, have solved the matrix, and have manipulated the bubble diagram into the preferred orientation, select the Master Menu option to move on to the next step in the OPTI/NET program. This will return you to the Master Menu to make your next selection.

## OPTI/NET Layout Optimization

### Layout

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To develop alternative block diagrams of the group of spaces under consideration, you must convert the bubble diagram into scaled rectangles. To do this, select the Layout option from the Master Menu. The bubbles will automatically be converted into scaled rectangles, and the scale chosen will be displayed in the Dialogue Window. Note that the OPTI/NET program will automatically select a default scale at which to display the scaled rectangles. The program chooses the largest size at which all of the blocks, in their current layout, will fit on the screen. This scale may be changed using the Scale command described below.

This command will cause the OPTI/NET Layout Menu to be displayed in the Action Window area. This menu has the following ten options:

- Move Space
- Rotate Space
- Gross ON/OFF
- Edit Gross
- Mirror L/R
- Mirror T/B
- Rotate CCW
- Rotate CW
- Scale
- Master Menu

At this time, the Dialogue Window will contain the following messages:

Gross Rectangle OFF  
Total Area in Department \_\_\_\_\_  
The default scale is \_\_\_\_\_

**Move Space:** The Move Space option allows you to move any rectangle on the screen to a new position. When you choose the Move Space option a cross hair will appear. Move the puck until the cross hair is located at the center of the rectangle that you wish to move, and then press down the yellow button on the puck. The name of the rectangle will disappear, and the rectangle will move around freely on the screen. When you have positioned it where you want it, press down the yellow button on the puck. The rectangle will be frozen in that location, the black box will be at its center, its text will reappear, and the cross hair will return.

You can also move the Gross Rectangle using this command. Simply identify the Gross Rectangle by its center, and then reposition it.

## OPTI/NET Layout Optimization

Layout, continued

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**Edit Gross:** The Edit Gross option allows the designer to change the length-width ratio of the Gross Rectangle. When you choose this option, the Edit Gross Menu will appear in the Action Menu window. This menu has the following six options :

1 : 1  
1 : 2  
2 : 3  
3 : 4

Other

### Layout Menu

In each of the first four choices, the figures specify the length to width ratio. If you select the Other option, the following message will appear in the Dialogue Window :

Please enter new ratio

...Length :

Type in the desired length ration and hit the RETURN key. Note that you must enter a whole number, fractions will be ignored. The following message will then appear :

...Width :

Type in the desired width ratio and hit the RETURN key. Again, note that you must enter a whole number, fractions will be ignored. If the Gross Rectangle is visible on the screen, then it will be immediately re-scaled, if it is not, then when it is made visible - by the use of the Gross ON/OFF command - it will have the length:width ratio specified.

To return to the Layout Menu after selecting the desired ratio, select the Layout Menu option.

## OPTI/NET Layout Optimization

Layout, continued  
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Mirror L/R: The Mirror L/R option flips the block diagram over from left to right. Choose this option twice to flip the diagram back to its original orientation.

Mirror T/B: The Mirror T/B option flips the block diagram over from top to bottom.

Rotate CCW: The Rotate CCW option rotates the block diagram ninety degrees counter-clockwise.

Rotate CW: The Rotate CW option rotates the block diagram ninety degrees clockwise.

Scale: The Scale option causes the current scale to be displayed in the Dialogue Window and the OPTI/NET Scale Menu is displayed in the Action Menu area. When you choose the Scale option, the following message will appear in the Dialogue Window:

Current Scale: N / D

The Scale Menu will also appear in the Action Menu area. The Scale Menu has the following seven options:

1 / 4  
1 / 8  
1 / 16  
1 / 32  
1 / 64  
Other

Layout Menu

If you select one of the alternative scales, the drawing will be immediately re-scaled.

## OPTI/NET Layout Optimization

Layout, continued

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To move another space, just move the cross hair to the center of that rectangle, and press down the yellow button on the puck. You may move as many spaces as you wish to before exiting this command.

To exit from the Move Space command, and return to the Action Menu, move the cross hair down into the Action Menu area. This returns control to the Action Menu, and you may now select another command.

**Rotate Space:** The Rotate Space option allows you to rotate any individual rectangle on the screen ninety degrees. When you choose this option, a cross hair will also appear. Move the puck so that the cross hair is located at the center of the rectangle you wish to rotate, and then press down the yellow button on the puck. The rectangle will be rotated ninety degrees, and the black box will appear in its center. The cross hair will also return.

To return the rectangle to its original orientation, just leave the cross hair at its center, and press down the yellow button on the puck.

To rotate any other rectangle, just move the cross hair to the center of that rectangle, and press down the yellow button on the puck. You may rotate any number of spaces before returning to the Action Menu.

To exit from the Rotate Space command, and return to the Action Menu, move the cross hair down in to the Action Menu area. This returns control to the Action Menu and you may now select another command.

**Gross ON/OFF:** The Gross ON/OFF option causes a rectangle of the gross area of the group of spaces under consideration to be displayed on the screen. This option acts as a switch to make the Gross Rectangle visible, or invisible, on the screen. Initially, the Gross Rectangle will be a square. The rectangle will appear on the screen, and the message in the Dialogue Window will be changed to:

Gross Rectangle ON

OPTI/NET Layout Optimization

Layout, continued

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If you select the Other option, the following message will appear in the Dialogue Window:

Please enter new scale

... Numerator :

Enter the desired numerator for the scale, and then hit the RETURN key. You must enter a whole number, any fractional part will be ignored. The following message will then appear :

... Denominator :

Enter the desired denominator for the scale, and then hit the RETURN key. Again, you must enter a whole number, any fractional part will be ignored. The drawing will be re-scaled immediately.

To return to the Layout Menu after selecting the desired scale, select the Layout Menu option.

Master Menu: When you have finished laying out the group of spaces and you wish to either store the diagram away or evaluate how well that layout meets the optimal criteria you established earlier, select the Master Menu option.

## OPTI/NET Layout Optimization

### Check Up

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The Check Up option allows you to quantitatively evaluate how well a given layout meets the optimal adjacency criteria that you entered into the adjacency matrix. When you choose this option, the OPTI/NET Check Up Menu will appear in the Action Menu window. The Check Up Menu has six options:

Check Up Criterion  
TOO NEAR  
TOO FAR

Check Up  
Identify

Screen Dump

Master Menu

**Check Up Criterion:** If you wish to see the Matrix flagging those spaces that are too close to one another, select the TOO NEAR option. If you wish to see the Matrix flagging those spaces that are too far from one another, select the TOO FAR option. If you do not choose either option before doing the Check Up, the OPTI/NET program will assume that the TOO NEAR option is required.

**Check Up:** This will cause the OPTI/NET program to check to see which pairs of spaces violate the check up criterion chosen, and to flag those violations in the Check Up Matrix that appears in the upper left corner of the screen. The spaces that are too far apart or too close together - depending on the option active at the time - are indicated by being reversed out in the matrix. In other words, they appear in the Check Up Matrix as white numbers in black diamonds. It is then up to the designer to determine if these flaws are significant or not. If they are significant, you may return to the Master Menu and select the Layout option, in order to rearrange the diagram, though it may help to first use the Identify option, described below, to see where the pairs of spaces concerned are currently situated.

## OPTI/NET Layout Optimization

### Check Up, continued

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**Identify:** When you choose the Identify option, a crosshair will appear and either the bubble diagram or the layout rectangles will be superimposed on the Check Up Matrix. The rectangles will appear only if the Layout option has been used since the adjacency matrix has last been Solved. You can then identify which spaces a particular entry in the Check Up Matrix refers to - whether or not that entry has been blacked out - by moving the crosshair up to that entry and pressing the yellow button. The bubbles or rectangles corresponding to that pair of spaces will blink for a few seconds so that you can identify them on the diagram. The names of the spaces and their adjacency value will also be printed in the Dialogue Window.

To identify another set of spaces, repeat the procedure. To return to the Check Up Menu, move the crosshair down into the Check Up Menu area.

**Screen Dump:** If you want a hard copy of the Check Up Matrix and bubble or rectangle diagram, you may select the Screen Dump option from the Matrix Menu. When you select this option, you will be asked, in the Dialogue Window, to ensure that the printer is switched on and is on-line; having done this press the RETURN key. The project, department and group names, the active check up option, the date and time, and the designers initials will appear in the Dialogue Window, and the printer will start to produce the copy. To quit from the hard copy at any time; type 'q' to which the program will respond by putting a Quit Confirmation Window up in the center of the screen; you can then confirm the quit request by typing a 'y' - for Yes - or simply pressing the Return key. When the screen dump has been completed, or you have quit from it, you can make another selection from the Menu.

**Master Menu:** When you have finished checking out the space layout and you wish to continue, select the Master Menu option.

## OPTI/NET Layout Optimization

Plot, continued

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The OPTI/NET program will then begin the plot. As soon as it has finished plotting, the following message will appear in the Dialogue Window :

HP Plot finished

HP File: When you choose this option you will be asked, in the Dialogue Window :

HP Plotter File Name ?

You should respond by typing the name you want for the file and pressing the RETURN key. If the file name already exists, you will be informed and asked if you wish to overwrite it. If you do this then the old file will be saved with a name of NAME.HP\$ so that you can still use it, if required. If you tell the OPTI/NET program not to overwrite the file, then it will exit from the HP File option and return you to the Plot Menu.

The OPTI/NET program then asks the following question in the Dialogue Window :

Do you want to rescale the plot ? [Yes or No]

If you answer 'No' to this question, the drawing will be plotted at whatever scale you have currently set in the Layout menu. For example, if you have been working on your block diagram at  $1/8" = 1'$ , the plot will be produced at  $1/8" = 1'$ .

If you answer 'Yes' to this question, you will be asked to enter a multiplication factor. This factor will be multiplied times the scale you have currently set in the Layout menu to determine the scale at which the block diagram will be plotted. For example, if you have been working at  $1/8" = 1'$ , but you want the plot to be at  $1/4" = 1'$ , you should enter a multiplication factor of '2'. Similarly, if you have been working at  $1/4" = 1'$  but you want a plot at  $1/16" = 1'$ , you should enter a multiplication factor of '.25'.

The following message will appear in the Dialogue Window :

Creating HP Plot File, please wait...

which is then followed, as soon as the file output has been completed, by the message :

HP Plot finished

## OPTI/NET Layout Optimization

### Plot

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To get a copy of whatever is on the screen at any time, select the Plot option. This will cause the Plot Menu to appear in the Action Menu area. The full Plot Menu has six options:

- HP Plotter
- HP File
  
- HI Plotter
- HI File
  
- Screen Dump
  
- Master Menu

If you have not yet used the Layout option, then only the Screen Dump option will appear, the rest of the Menu being blank.

**HP Plotter:** This option causes the OPTI/NET program to output the layout rectangles drawing directly to the Hewlett Packard plotter. When you choose this option the program asks you to check that the plotter is switched on and is on-line. When you have done this press the RETURN key.

The OPTI/NET program then asks the following question in the Dialogue Window :

Do you want to rescale the plot ? [Yes or No]

If you answer 'No' to this question, the drawing will be plotted at whatever scale you have currently set in the Layout menu. For example, if you have been working on your block diagram at  $1/8" = 1'$ , the plot will be produced at  $1/8" = 1'$ .

If you answer 'Yes' to this question, you will be asked to enter a multiplication factor. This factor will be multiplied times the scale you have currently set in the Layout menu to determine the scale at which the block diagram will be plotted. For example, if you have been working at  $1/8" = 1'$ , but you want the plot to be at  $1/4" = 1'$ , you should enter a multiplication factor of '2'. Similarly, if you have been working at  $1/4" = 1'$  but you want a plot at  $1/16" = 1'$ , you should enter a multiplication factor of '.25'.

## OPTI/NET Layout Optimization

Plot, continued

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HI Plotter: This option causes the OPTI/NET program to output the layout rectangles drawing directly to the Houston Instrument plotter. When you choose this option the program asks you to check that the plotter is switched on and is on-line. When you have done this press the RETURN key.

The OPTI/NET program then asks the following question in the Dialogue Window :

Do you want to rescale the plot ? [Yes or No]

If you answer 'No' to this question, the drawing will be plotted at whatever scale you have currently set in the Layout menu. For example, if you have been working on your block diagram at  $1/8" = 1'$ , the plot will be produced at  $1/8" = 1'$ .

If you answer 'Yes' to this question, you will be asked to enter a multiplication factor. This factor will be multiplied times the scale you have currently set in the Layout menu to determine the scale at which the block diagram will be plotted. For example, if you have been working at  $1/8" = 1'$ , but you want the plot to be at  $1/4" = 1'$ , you should enter a multiplication factor of '2'. Similarly, if you have been working at  $1/4" = 1'$  but you want a plot at  $1/16" = 1'$ , you should enter a multiplication factor of '.25'.

The OPTI/NET program will then begin the plot. As soon as it has finished plotting, the following message will appear in the Dialogue Window :

HI Plot finished

HI File: When you choose this option you will be asked, in the Dialogue Window :

HI Plotter File Name ?

you should respond by typing the name you want for the file and pressing the RETURN key. If the file name already exists, you will be informed and asked if you wish to overwrite it. If you do this then the old file will be saved with a name of NAME.HI\$ so that you can still use it, if required. If you tell the OPTI/NET program not to overwrite the file, then it will exit from the HP File option and return you to the Plot Menu.

## OPTI/NET Layout Optimization

Plot, continued

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The OPTI/NET program then asks the following question in the Dialogue Window :

Do you want to rescale the plot ? [Yes or No]

If you answer 'No' to this question, the drawing will be plotted at whatever scale you have currently set in the Layout menu. For example, if you have been working on your block diagram at  $1/8" = 1'$ , the plot will be produced at  $1/8" = 1'$ .

If you answer 'Yes' to this question, you will be asked to enter a multiplication factor. This factor will be multiplied times the scale you have currently set in the Layout menu to determine the scale at which the block diagram will be plotted. For example, if you have been working at  $1/8" = 1'$ , but you want the plot to be at  $1/4" = 1'$ , you should enter a multiplication factor of '2'. Similarly, if you have been working at  $1/4" = 1'$  but you want a plot at  $1/16" = 1'$ , you should enter a multiplication factor of '.25'.

The following message will then appear in the Dialogue Window :

Creating HI Plot File, please wait...

which is then followed, as soon as the file output has been completed, by the message :

HI Plot finished

Screen Dump: When you select this option, you will be asked, in the Dialogue Window, to ensure that the printer is switched on and is on-line; having done this press the RETURN key. The project, department and group names, the date and time, and the designers initials will appear in the Dialogue Window, and the printer will start to produce the copy. To quit from the hard copy at any time; type 'q' to which the program will respond by putting a Quit Confirmation Window up in the center of the screen; you can then confirm the quit request by typing a 'y' - for Yes - or simply pressing the Return key. When the screen dump has been completed, or you have quit from it, you can make another selection from the Menu.

Master Menu: When you have finished plotting select the Master Menu option.

## OPTI/NET Layout Optimization

### Save / Retrieve

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Since you will seldom completely finish working on a layout in one worksession, you must store your files away on the hard disc. Then, at a later point, you can recall those files for additional work. When you choose the Save/Retrieve option the OPTI/NET Retrieve Menu will appear in the Action Menu area. The Save/Retrieve Menu has the following four options:

Retrieve

Save

DRAFT Save

Master Menu

Retrieve: To recall a previously stored file, select the Retrieve option. The following message will appear in the Dialogue Window:

Please choose a File from the Menu

A menu of file names will appear under the cursor. If the file you wish to read is in that menu, simply point at it and press the button. If it is not, then it MAY be in a file directory contained within the current area of the disc. Any file directories will appear in the pop-up menu as NAME.DR. If you point at one of these, then a new menu, containing the Files in this directory will appear. You can then choose from this menu, if you see the file you require. To go back up one level of menus, or to exit from the first menu, simply move the cursor off the menu area and press the yellow button. If you exit from the first menu, then the OPTI/NET program will tell you it has failed to find the file, and you should choose the Fetch Old option again.

When you have chosen a file name, the OPTI/NET program checks the file and then starts to read it into memory. The OPTI/NET program will tell you where it is in the retrieval process in the Dialogue Window, where you will see the following messages:

...Retrieving spaces.  
...Retrieving matrix.  
...Retrieving layout.  
...Retrieving Cross Rectangle.

The database will then be displayed on the screen, to allow you to verify that you have retrieved the correct group of spaces.

## OPTI/NET Layout Optimization

### Exit OPTI/NET

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When you have finished working in OPTI/NET, turn off the program by selecting the Exit OPTI/NET option. If you have created a new database or a new layout and not yet saved either of them, the OPTI/NET program will warn you and give you the opportunity of going back and doing so. The OPTI/NET menu system will disappear, and you can now use the GRAPH/NET system for other purposes.

## OPTI/NET Layout Optimization

Save / Retrieve, continued

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Select the Master Menu option, and then continue to work on the recalled file. If you select Matrix from the Master Menu, then the stored adjacency matrix will be displayed. If you select Layout, then the block diagram as you last stored it will be displayed.

Save: There are three key times when you should save your work on the computer. The first is immediately on converting from bubbles to scaled rectangles. The second is any time that you have spent a considerable amount of time on a layout. The third is when you finish working on a layout, at the end of a worksession, or when the layout is ready to receive further detailing in the drafting program. In general, when in doubt, SAVE!!

The following message will appear in the Dialogue Window.

What name for the saved file?

Type in on the keyboard the name you want to give the layout, and then hit the RETURN key. If a file by that name is already stored on the computer, you will see a message in the Dialogue Window asking if you wish to overwrite the older file. If you answer YES to this question, then the older version will be saved as NAME.OPTI\$, to enable you to recall it later, should this prove necessary. If what you are now storing is a different layout, or you do wish to keep the older layout, answer NO, and hit the RETURN key. Then re-select Save and enter a different filename. Remember that only one digit of the file name must be different, so that if you are storing alternative layouts of the same group of spaces, you can just number them 1,2,3,etc., and they will be stored under valid, and different, filenames.

When the OPTI program has finished storing the data on the hard disk, you will see the following message in the Dialogue Window.

\_\_\_\_\_.opti saved

The save may take a short while to complete, do not leave the program until you see the above message.

## OPTI/NET Layout Optimization

Save / Retrieve, continued

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Remember that you MUST have stored away the DataBase that corresponds to the layout that you are now storing, or you will have a problem later on when you try to recall the layout.

DRAFT Save: This option enables you to convert the Layout rectangles diagram into DRAFT/NET format. It creates a file in the DRAFTNET part of the hard disc. When you choose this option, the following message appears in the Dialogue Window :

DRAFT File Name ?

Type in the name you want to give the DRAFT layout, and hit the RETURN key. If a file by that name is already stored on the hard disc, you will see a message in the Dialogue Window asking you if you wish to overwrite the older file. If you answer YES to this question, then the older version will be stored as NAME.DP\$, in the DRAFTNET part of the disc, which gives you the option of recalling it later, should this prove necessary. If you answer NO, then you should select another option from the Retrieve/Save menu.

Master Menu: After saving or retrieving a file, return to the Master Menu by selecting the Master Menu option.