

References

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APPENDIX

SECTION

APPENDIX A

Installation - time, employee required

No.	Details	Hour(s)					Operator(s)	
		1	2	3	4	5	W*	M*
1	Dismantle equip.:air tank, fuel tank, battery tray	1	1	1	--	--	1	--
2	Dismantle equip.:air tank, fuel tank, battery tray,air hose	--	--	--	--	3	2	--
3	Dismantle equip.:rear light	--	--	--	1	--	1	--
4	Adjust subframe	--	--	1	--	--	1	--
5	Install long flat bar	--	--	--	2	--	1	--
6	Install flat bar	1	2	--	--	1	1	--
7	Install tie-in	4	4	4	4	4	2	--
8	Install long subframe	--	--	--	4	--	2	--
9	Reinforcement	--	--	--	4	--	2	--
10	Install subframe	3	4	--	--	2	2	--
11	Weld subframe-support,chassis-support	3	3	3	3	3	2	--
12	Refit equip.:air tank,fuel tank,battery tray	3	3	3	--	3	2	--
13	Install spare tyre housing	--	--	--	--	3	2	--
14	Install crane, tighten pound	2	2	2	2	2	--	2
15	Assemble extension beam, outrigger leg, hydraulic hose	2	2	2	2	2	--	2
16	Install P.T.O., slow, lever, bracket	2	2	2	2	2	--	1
17	Install drive shaft, pump	2	2	2	2	2	--	1
18	Install pressure suction hose, return hose, fill hydraulic oil	1	1	1	1	1	--	1
19	Leakage check, final check, final test before delivery	3	3	3	3	3	--	1
Total hours		27	29	24	30	31		
Total days		3.5	3.5	3	4	4		
Total welders		2	2	2	2	2		
Total mechanics		2	2	2	2	2		

Remark : W*= No. of Welders required. M* = No. of Mechanics required.

Table A-1 : Summary of time and employee required for installation No. 1-5

Installation step comparison

Pattern 4: Crane installed at rear side of the truck

Current

No.	Steop No.	Day 1																Day 2																Day 3																Day 4																W*	M*
		Hrs.	8	9	10	11	13	14	15	16	8	9	10	11	13	14	15	16	8	9	10	11	13	14	15	16	8	9	10	11	13	14	15	16																																	
			9	10	11	12	14	15	16	17	9	10	11	12	14	15	16	17	9	10	11	12	14	15	16	17	9	10	11	12	14	15	16	17																																	
1	1-2	3																																															1	--																	
2	3-6	15																																																2	--																
3	7-9	4																																																--	2																
4	10-12	8																																																--	1																
Total		30																																															2	2																	

Proposed

No.	Steop No.	Day 1																Day 2																Day 3																Day 4																W*	M*
		Hrs.	8	9	10	11	13	14	15	16	8	9	10	11	13	14	15	16	8	9	10	11	13	14	15	16	8	9	10	11	13	14	15	16																																	
			9	10	11	12	14	15	16	17	9	10	11	12	14	15	16	17	9	10	11	12	14	15	16	17	9	10	11	12	14	15	16	17																																	
1	1-6	16																																																2	--																
2	7-9	4																																																--	2																
3	10-12	8																																																--	1																
Total		28																																																2	2																

Remark: W* = No. of Welders required, M* = No. of Mechanics required

Figure A-9 : Comparison between current and proposed pattern 4

Summary of proposed installation patterns

No.	Pattern name	Day1		Day2		Day3		Day4		Total	
		8-12	13-17	8-12	13-17	8-12	13-17	8-12	13-17	Hours	Days
1	Crane installed with short subframe		2 welds.			2 mechs.		1 mech.		28	3.5
2	Crane installed with long subframe		2 welds.			2 mechs.		1 mech.		28	3.5
3	Crane installed with subframe already available	1 weld.	2 welds.		2 mechs.		1 mech.			24	3.0
4	Crane installed at rear side of the truck		2 welds.			2 mechs.		1 mech.		28	3.5
5	Crane installed to tractor head			2 welds.			2 mechs.		1 mech.	32	4.0

Remark : weld(s).= welder(s), mech(s). = mechnic(s)

Figure A-11 : Summary of proposed installation patterns



APPENDIX B

User Manual

How to get into Job Allocation Plan Program

1. At C:\> , key **WIN** and press Enter.
2. Double click **Microsoft Access** icon. The screen will show **Microsoft Access** program.
3. At menu bar, click **File, Open Database**. The screen will show window **Open Database**.
4. At Directories box, double click **job_invt**.
5. At File Names box, double click **jidb.mdb**. The screen will show the main window of Job Allocation Plan Program. Menu bar of this screen will show the following menus:
 - Master File
 - Preventive Maintenance (P.M.)
 - Job Allocation Plan
 - Inventory Control
 - Report
 - Exit

How to get into Master File Menu

1. At main window of Job Allocation Plan Program, click menu **Master file**. The following sub menus will be listed down
 - Center (Service Center Data)
 - Title (Employee Title Data)
 - Employee (Employee Data)
 - Customer (Customer Data)
 - Standard Job (Standard Job Data)

- Standard Job Detail (Details of standard job)
- Standard Job and Details (Each standard job and its details)
- Product (Product Data)
- Sold Product (Sold Product Data)
- Parts (Parts Details)

Master file contains main concerned data. The data can be changed (**Add, Edit, Delete**) anytime as you want.

- **Change Service Center data**

Add new Service Center

1. At main window of Job Allocation Plan Program, click menu **Master file** and sub menu **Center**. The screen will show **Center List**.
2. Click **Add**.
3. Input the following data: **Center Code** and press Enter. **Center Name** and press Enter. **Number of bays** and press Enter.
4. Click **OK**. The screen will get back into the main window of Job Allocation Plan Program.

Edit Service Center

1. At main window of Job Allocation Plan Program, click menu **Master file** and sub menu **Center**. The screen will show **Center List**.
2. Click **Edit**.
3. Move mouse to the record you want to edit. Click the field you want to edit. Edit the data and press Enter.
4. Repeat step 3 until complete all fields.
5. Click **OK**. The screen will get back into the main window of Job Allocation

Delete Service Center

1. At main window of Job Allocation Plan Program, click menu **Master file** and sub menu **Center**. The screen will show **Center List**.
2. Move mouse to the record you want to delete.
3. Click **Delete**.
4. Click **OK** at confirmed window.
5. Repeat step 2 to 4 until complete all records you want to delete.
6. Click **OK**. The screen will get back into the main window of Job Allocation Plan Program.

Cancel Service Center change

During changing **Service Center** data. You can cancel any change by clicking **Cancel**. Then, the screen will get back into the main window of Job Allocation Plan Program. Any change you did will have no effect to the data.

● **Change Title**

Add new Employee Title

1. At main window of Job Allocation Plan Program, click menu **Master file** and sub menu **Title**. The screen will show **Title List**.
2. Click **Add**.
3. Input the following data: **Title Code** and press Enter. **Title Name** and press Enter.
4. Click **OK**. The screen will get back into the main window of Job Allocation Plan Program.

Edit Employee Title

1. At main window of Job Allocation Plan Program, click menu **Master file** and sub menu **Title**. The screen will show **Title List**.

2. Click **Edit**.
3. Move mouse to the record you want to edit. Click the field you want to edit.
Edit the data and press Enter.
4. Repeat step 3 until complete all fields
5. Click **OK**. The screen will get back into the main window of Job Allocation Plan Program.

Delete Employee Title

1. At main window of Job Allocation Plan Program, click menu **Master file** and sub menu **Title**. The screen will show **Title List**.
2. Move mouse to the record you want to delete.
3. Click **Delete**.
4. Click **OK** at confirmed window.
5. Repeat step 2 to 4 until complete all records you want to delete.
6. Click **OK**. The screen will get back into the main window of Job Allocation Plan Program.

Cancel Employee Title change

During changing **Employee Title** data. You can cancel any change by clicking **Cancel**. Then, the screen will get back into the main window of Job Allocation Plan Program. Any change you did will have no effect to the data.

● **Change Employee Data**

Add new Employee

1. At main window of Job Allocation Plan Program, click menu **Master file** and sub menu **Employee**. The screen will show **Employee List**.
2. Click **Add**.

3. At **Employee Code** input data and press Enter.
4. At **Salutation** field, click the arrow. The salutation list will be shown. Click the salutation of this employee and press Enter.
5. Input the following data: **Employee Name** and press Enter. **Employee Surname** and press Enter.
6. At **Title** field, click the arrow. The title list will be shown. Click the title of this employee and press Enter.
7. Input **Wage per hour** of this employee and press Enter.
8. At **Center** field, click the arrow. The Center list will be shown. Click the title this employee work for and press Enter.
9. Click **OK**. The screen will get back into the main window of Job Allocation Plan Program.

Edit Employee

1. At main window of Job Allocation Plan Program, click menu **Master file** and sub menu **Employee**. The screen will show **Employee List**.
2. Click **Edit**.
3. Move mouse to the record you want to edit. Click the field you want to edit. Edit the data and press Enter.
4. Repeat step 3 until complete all fields
5. Click **OK**. The screen will get back into the main window of Job Allocation Plan Program.

Delete Employee

1. At main window of Job Allocation Plan Program, click menu **Master file** and sub menu **Title**. The screen will show **Title List**.
2. Move mouse to the record you want to delete.

3. Click **Delete**.
4. Click **OK** at confirmed window.
5. Repeat step 2 to 4 until complete all records you want to delete.
6. Click **OK**. The screen will get back into the main window of Job Allocation Plan Program.

Cancel Employee change

During changing **Employee** data. You can cancel any change by clicking **Cancel**. Then, the screen will get back into the main window of Job Allocation Plan Program. Any change you did will have no effect to the data.

● **Change Customer Data**

Add new Customer

1. At main window of Job Allocation Plan Program, click menu **Master file** and sub menu **Customer**. The screen will show **Customer List**.
2. Click **Add**.
3. Input the following data: **Customer Code** and press Enter. **Customer Name** and press Enter. **Province** and press Enter. **Attention** mad Press Enter. **Telephone Number** and press Enter.
4. Click **OK**. The screen will get back into the main window of Job Allocation Plan Program.

Edit Customer

1. At main window of Job Allocation Plan Program, click menu **Master file** and sub menu **Customer**. The screen will show **Customer List**.
2. Click **Edit**.
3. Move mouse to the record you want to edit. Click the field you want to edit.

Edit the data and press Enter.

4. Repeat step 3 until complete all fields
5. Click **OK**. The screen will get back into the main window of Job Allocation Plan Program.

Delete Customer

1. At main window of Job Allocation Plan Program, click menu **Master file** and sub menu **Customer**. The screen will show **Customer List**.
2. Move mouse to the record you want to delete.
3. Click **Delete**.
4. Click **OK** at confirmed window.
5. Repeat step 2 to 4 until complete all records you want to delete.
6. Click **OK**. The screen will get back into the main window of Job Allocation Plan Program.

Cancel Customer change

During changing **Customer** data. You can cancel any change by clicking **Cancel**. Then, the screen will get back into the main window of Job Allocation Plan Program. Any change you did will have no effect to the data.

● **Change Standard Job Data**

Add new Standard Job

1. At main window of Job Allocation Plan Program, click menu **Master file** and sub menu **Standard Job**. The screen will show **Standard Job List**.
2. Click **Add**.
3. Input the following data: **Standard Job Code** and press Enter, **Standard Job Name** and press Enter.

4. At **Pattern** field, click the arrow. The pattern list (Installation, P.M.) will be shown. Click job pattern of this job and press Enter.
5. At **Bay** field, click the arrow. Click **Yes**, if this job must be operated in the bay or click **No**, if this job can be operated without using bay. Then, press Enter.
6. Input number of employees used for this job in the following field: **Welders** and press Enter. **Mechanics** and press Enter. **Electrician** and press Enter.
7. At **Days** field, input number of total days used for this job and press Enter.
8. Click **OK**. The screen will get back into the main window of Job Allocation Plan Program.

Edit Standard Job

1. At main window of Job Allocation Plan Program, click menu **Master file** and sub menu **Standard Job**. The screen will show **Standard Job List**.
2. Click **Edit**.
3. Move mouse to the record you want to edit. Click the field you want to edit. Edit the data and press Enter.
4. Repeat step 3 until complete all fields
5. Click **OK**. The screen will get back into the main window of Job Allocation Plan Program.

Delete Standard Job

1. At main window of Job Allocation Plan Program, click menu **Master file** and sub menu **Standard Job**. The screen will show **Standard Job List**.
2. Move mouse to the record you want to delete.
3. Click **Delete**.
4. Click **OK** at confirmed window.
5. Repeat step 2 to 4 until complete all records you want to delete.

6. Click **OK**. The screen will get back into the main window of Job Allocation Plan Program.

Cancel Standard Job change

During changing **Standard Job** data, You can cancel any change by clicking **Cancel**. Then, the screen will get back into the main window of Job Allocation Plan Program. Any change you did will have no effect to the data.

● **Change Standard Job Details Data**

Add new Standard Job Details

1. At main window of Job Allocation Plan Program, click menu **Master file** and sub menu **Standard Job Details**. The screen will show **Standard Job Details List**.
2. Click **Add**.
3. At **Standard Job Name** field, click the arrow. The standard job name list will be shown. Click standard job name to define job detail and press Enter.
Standard Job Code in the left field will be shown automatically.
4. Input **Interval Number** and press Enter.
5. At **Title** field, click the arrow. The title list (Welder, Mechanic, Electrician) will be shown. Click the title used for this interval and press Enter.
6. Input number of title used for this interval in **Quantity** field and press Enter.
7. Input number of days used for this interval in **Days** field and press Enter.
8. Click **OK**. The screen will get back into the main window of Job Allocation Plan Program.

Edit Standard Job Details

1. At main window of Job Allocation Plan Program, click menu **Master file** and

sub menu **Standard Job Details**. The screen will show **Standard Job Details List**.

2. Click **Edit**.
3. Move mouse to the record you want to edit. Click the field you want to edit.
Edit the data and press Enter.
4. Repeat step 3 until complete all fields
5. Click **OK**. The screen will get back into the main window of Job Allocation Plan Program.

Delete Standard Job Details

1. At main window of Job Allocation Plan Program, click menu **Master file** and sub menu **Standard Job Details**. The screen will show **Standard Job Details List**.
2. Move mouse to the record you want to delete.
3. Click **Delete**.
4. Click **OK** at confirmed window.
5. Repeat step 2 to 4 until complete all records you want to delete.
6. Click **OK**. The screen will get back into the main window of Job Allocation

Cancel Standard Job Details change

During changing **Standard Job details** data. You can cancel any change by clicking **Cancel**. Then, the screen will get back into the main window of Job Allocation Plan Program. Any change you did will have no effect to the data.

● **Standard Job and Details**

This sub menu collects the data of two previous sub menus to show record by record. You can move to look up each standard job and its details by pressing four

buttons located at the bottom of the screen. In addition, **Close** button is designed to exit this sub menu.

- **Change Product Data**

- Add new Product**

1. At main window of Job Allocation Plan Program, click menu **Master file** and sub menu **Product**. The screen will show **Product List**.
2. Click **Add**.
3. Input the following data: **Product Code** and press Enter, **Product Name** and press Enter, **Number of P.M.** and press Enter.
4. Click **OK**. The screen will get back into the main window of Job Allocation Plan Program.

- Edit Product**

1. At main window of Job Allocation Plan Program, click menu **Master file** and sub menu **Product**. The screen will show **Product List**.
2. Click **Edit**.
3. Move mouse to the record you want to edit. Click the field you want to edit. Edit the data and press Enter.
4. Repeat step 3 until complete all fields
5. Click **OK**. The screen will get back into the main window of Job Allocation Plan Program.

- Delete Product**

1. At main window of Job Allocation Plan Program, click menu **Master file** and sub menu **Product**. The screen will show **Product List**.
2. Move mouse to the record you want to delete.

3. Click **Delete**.
4. Click **OK** at confirmed window.
5. Repeat step 2 to 4 until complete all records you want to delete.
6. Click **OK**. The screen will get back into the main window of Job Allocation

Cancel Product change

During changing **Product** data. You can cancel any change by clicking **Cancel**. Then, the screen will get back into the main window of Job Allocation Plan Program. Any change you did will have no effect to the data.

● **Change Sold Product Data**

Add new Sold Product

1. At main window of Job Allocation Plan Program. click menu **Master file** and sub menu **Sold Product**. The screen will show **Sold Product List**.
2. Click **Add**.
3. At **Product Name** field. click the arrow. Click product name and press Enter.
4. At **Customer Name** field. click the arrow. The standard customer name list will be shown. Click name of customer who bought this product and press Enter.
5. Input the following data: **Serial Number** and press Enter.
6. At **Installation Pattern** field. click the arrow. The installation pattern list will be shown. Click the installation pattern operated to this product and press Enter.
7. Input **First P.M. Date** and press Enter.
8. Click **OK**. The screen will get back into the main window of Job Allocation Plan Program.

Edit Sold Product

1. At main window of Job Allocation Plan Program. click menu **Master file** and

sub menu **Sold Product**. The screen will show **Sold Product List**.

2. Click **Edit**.
3. Move mouse to the record you want to edit. Click the field you want to edit.
Edit the data and press Enter.
4. Repeat step 3 until complete all fields
5. Click **OK**. The screen will get back into the main window of Job Allocation Plan Program.

Delete Sold Product

1. At main window of Job Allocation Plan Program, click menu **Master file** and sub menu **Sold Product**. The screen will show **Sold Product List**.
2. Move mouse to the record you want to delete.
3. Click **Delete**.
4. Click **OK** at confirmed window.
5. Repeat step 2 to 4 until complete all records you want to delete.
6. Click **OK**. The screen will get back into the main window of Job Allocation

Cancel Sold Product change

During changing **Sold Product** data. You can cancel any change by clicking **Cancel**. Then, the screen will get back into the main window of Job Allocation Plan Program. Any change you did will have no effect to the data.

● **Change Parts Data**

Add new Parts

1. At main window of Job Allocation Plan Program, click menu **Master file** and sub menu **Parts**. The screen will show **Parts List**.
2. Click **Add**.

3. Input the following data: **Part Number** and press Enter, **Part Name** and press Enter, **Cost per unit** and press Enter, **Tax(%)** and press Enter, **Plus(%)** and press Enter, **'97 Demand Forecasting** and press Enter.
4. Click **OK**. The screen will get back into the main window of Job Allocation Plan Program.

Edit Parts

1. At main window of Job Allocation Plan Program, click menu **Master file** and sub menu **Parts**. The screen will show **Parts List**.
2. Click **Edit**.
3. Move mouse to the record you want to edit. Click the field you want to edit. Edit the data and press Enter.
4. Repeat step 3 until complete all fields.
5. Click **OK**. The screen will get back into the main window of Job Allocation Plan Program.

Delete Parts

1. At main window of Job Allocation Plan Program, click menu **Master file** and sub menu **Parts**. The screen will show **Parts List**.
2. Move mouse to the record you want to delete.
3. Click **Delete**.
4. Click **OK** at confirmed window.
5. Repeat step 2 to 4 until complete all records you want to delete.
6. Click **OK**. The screen will get back into the main window of Job Allocation

Cancel Parts change

During changing **Parts** data, You can cancel any change by clicking **Cancel**. Then, the screen will get back into the main window of Job Allocation Plan Program. Any change you did will have no effect to the data.

How to get into Preventive Maintenance (P.M.) Menu

1. At main window of Job Allocation Plan Program, click menu **P.M. Menu** . The following sub menus will be listed down
 - History (P.M. History)
 - No Action (Pass P.M.-No Action)
 - Next Action (Next P.M. Action)

How to use History sub menu

P.M. History sub menu is designed to show P.M. activities that were operated. The operator can check whether P.M. details of any sold products that have already done from this sub menu.

1. At main window of Job Allocation Plan Program, click menu **P.M.** and sub menu **History**.
2. When you want to exit from this sub menu, click **Close**. The screen will get back into the main window of Job Allocation Plan Program.

How to use No Action sub menu

Pass P.M. - No Action sub menu is designed to show planned P.M. activities. These activities were overdue and were not taken action. However, when these activities have already operated, the program is designed to receive data of these P.M. in terms of their descriptions and actual service date.

1. At main window of Job Allocation Plan Program. click menu **P.M.** and sub menu **No Action**.
2. Click a P.M. activity from the list.
3. At **P.M. Description** field. click the arrow. The P.M. description will be shown.
Click P.M. description that was operated to this P.M. activity.
4. At **Actual Service Date** field. input actual service date and press Enter.
5. Repeat step 2 to 4 until complete all acted P.M. records.
6. Click **Close**. The screen will get back into the main window of Job Allocation Plan Program.

How to use Next Action sub menu

Next P.M. Action sub menu is designed to show planned P.M. activities. These activities are planned to operated in the near future. If any activities are ready to operate. the program is designed to receive data of these P.M. in terms of their descriptions and actual service date.

1. At main window of Job Allocation Plan Program. click menu **P.M.** and sub menu **Next Action**.
2. Click a P.M. activity from the list.
3. At **P.M. Description** field. click the arrow. The P.M. description will be shown.
Click P.M. description that was operated to this P.M. activity and press Enter.
4. At **Actual Service Date** field. input actual service date and press Enter.
5. Repeat step 2 to 4 until complete all acted P.M. records.
6. Click **Close**. The screen will get back into the main window of Job Allocation Plan Program.

How to get into Job Allocation Plan Menu

1. At main window of Job Allocation Plan Program. click menu **Job Allocation**

Plan Menu . The following sub menus will be listed down

- Job Control
- Job Schedule
- Employee Schedule
- Bay Schedule
- Parts Used
- Job Summary

How to use Job Control sub menu

Job Control is designed use for open job. edit job. close job. This sub menu contains four boxes. They are **Data Box** used for record data of customer and his requirement. **Date Box** used for show and record date data. **Search Box** used for search data when a user wants to edit data. **Edit Box** used for edit data.

● **Open new job**

1. At main window of Job Allocation Plan Program. click menu **Job Allocation**

Plan and sub menu **Job Control** . The screen will show **Job Control**.

2. Click **New**

3. Input Customer data in **Data Box**. At S/N field. click the arrow. The list of serial number of sold product will be shown. Click the serial number of the product used by this customer. Data in **Customer** field and **Product** field will be automatically shown. **Job No.** in **Edit Box** is also automatically shown and assigned to this requirement.

4. At **Job Pattern** field, click the arrow. List of job pattern (Installation, P.M., Fix in, Fix out) will be shown. Click job pattern this employee wants to get service.
 - If the job pattern is **Standard Job** operated at service center (Installation). data in Expected Time Used, Bay, No. of welder, No. of mechanic, No. of Electrician fields will be automatically shown.
 - If the job pattern is **Non-Standard Job** (P.M., Fix in, Fix out), user has to input data in Expected Time Used, Bay, No. of welder, No. of mechanic, No. of Electrician, and Place fields by himself.
5. At **Expected Finish Date** field, data will equal expected start date plus expected time used. The ● M shows morning time and O M shows afternoon time.
6. At **Date Box**, input **Contact Date, Expected Start Date with ● M or O M**.
7. At **Edit Box** in **Center** field, click the arrow. The center list will be shown. Click the required service center and click **Assign**.
8. If the facilities of required service center are available, the program will record **Reserved** status to this job and required facilities.
9. If the facilities of required service center are not available, the program will show the screen of other choices of available service center and its available time. Click the available service center from the list and click **OK**, if the customer can accept the proposed choice. On the other hand, click cancel if the customer can not accept the proposed choices.

- **Edit the existing job**

This program is designed for the user to update job progress when the following cases occur.

- Start actual job processing.

- Every working day at noon and evening.
- As soon as job has got any problem and can not continue operating
- Resume job from pending status
- Close Job

Start actual job processing

1. At main window of Job Allocation Plan Program. click menu **Job Allocation Plan** and sub menu **Job Control** . The screen will show **Job Control**.
2. Click **Edit**.
3. At **Search Box** in **Job No.** field. click the arrow. List of Job No. will be shown. Click Job No. you want to edit. The data in other fields on screen will automatically shown data of last updated. If you can not remember Job No. he want to edit, he can search data from Customer, Product, and S/N fields from this box.
4. At **Date Box**. input data in **Actual Start Date** and **O M** fields.
5. At **Edit Box** in **Job Status** field. Click **operating**.
6. Click **Save**. If the reserved facilities are available at this time, the program will accept this edit data. If the reserved facilities are not available at that time, the program will show name of facilities that is not available.

Every working day / Job has got some problems / Close Job

1. At main window of Job Allocation Plan Program. click menu **Job Allocation Plan** and sub menu **Job Control** . The screen will show **Job Control**.
2. Click **Edit**.
3. At **Search Box** in **Job No.** field. List of Job No. will be shown. Click Job No.

you want to edit. The data in other fields on screen will automatically shown data of last updated. If user can not remember Job No. he want to edit, he can search data from Customer, Product, and S/N fields from this box.

4. At **Edit Box** in **Job Status** field, click the arrow. The status list will be shown. Click current status of this job.
5. At **Remark** field, click the arrow. The remark list will be shown. Click current remark of this job.
6. At **Progress** field, input percentage of progress of this job.
7. Click **Save**.

Resume Job

1. At main window of Job Allocation Plan Program, click menu **Job Allocation Plan** and sub menu **Job Control** . The screen will show **Job Control**.
2. Click **Edit** and find **Job No.** you want to resume from search box.
3. At **Edit Box** in **Job Status** field, click the arrow. The status list will be shown. Click **Operating** status. If the facilities that were assigned to this job are available, program will accept this assignment.
4. If those facilities are not available, program will inform user that the facilities used to assigned to this job are now assigned to another operating job. User has to change status of those facilities by changing status of the operating job that those facilities are now assigned to. User can find Job No. of operating job from search box. Then, user has to change status of operating job from **Operating** to **Pending**. After that, user has to find Job No. of the job that user wants to resume from search box and change its status from **Pending** to **Operating**.

Cancel Job Allocation Plan Change

During changing **Job** data. You can cancel any change by clicking **Cancel**.

Program will cancel any change you did in that time.

Close Job Control screen

You can close **Job Control screen** by clicking **Close** button. Then, the screen will get back into the main window of Job Allocation Plan Program.

How to use Job Schedule sub menu

Job Schedule is designed to show plan (P) and actual (A) schedule of each job operated by each service center in the focused time interval. The schedule is shown in form of Gantt chart. The length and color of the bar represent time interval and status of the job. The meanings of the colors are listed in the following list.

Table B-1 : Colors of bar and its meaning

No.	Color	Status
1	Free	No color
2	Brown	Can't service
3	Light blue	Reserved
4	Yellow	Wait
5	Blue	Queue
6	Green	Operating
7	Red	Pending
8	Black	Closed
9	Pink	Cancel

Remark : These colors are also used to Employee and Bay status

1. At main window of Job Allocation Plan Program, click menu **Job Allocation Plan** and sub menu **Job Schedule** . The screen will show **Job Schedule**.
2. Click **Edit**
3. At **From** field, input start date and press Enter.
4. At **To** field, input end date and press Enter.
5. At **Center** field, click the arrow. The Center list will be shown. Click center name and press Enter.
6. Wait until highlight at center field blinks. Double click at the Gantt chart and click again out of Gantt chart. The Gantt chart will show schedule of jobs operated by selected service center.
7. At **Job No. field**, click the arrow. The list of Job No. will be shown. Click Job No. you want to investigate.
8. Click **Close** when you want to close this screen. The screen will get back into the main window of Job Allocation Plan Program.

How to use Employee Schedule sub menu

Employee Schedule is designed to show plan (P) and actual (A) schedule of individual employee of each service center in the focused time interval. The schedule is shown in form of Gantt chart. The length and color of the bar represent time interval and status of the employee.

1. At main window of Job Allocation Plan Program, click menu **Job Allocation Plan** and sub menu **Bay Schedule** . The screen will show **Bay Schedule**.
2. Click **Edit**
3. At **From** field, input start date and press Enter.
4. At **To** field, input end date and press Enter.

5. At **Center** field, click the arrow. The center list will be shown. Click center name and press Enter.
6. At **Title** field, click the arrow. The title list will be shown. Click title you want to investigate and press Enter.
7. Wait until highlight at title field blinks. Double click at the Gantt chart and click again out of Gantt chart. The Gantt chart will show schedule of employee of selected center and title.
8. At **Emp. Name** field, click the arrow. The list of employee name will be shown. Click name of employee you want to investigate.
9. At **Job No.** field, click the arrow. The list of Job No. will be shown. Click Job No. you want to investigate.
10. Click **Close** when you want to close this screen. The screen will get back into the main window of Job Allocation Plan Program.

How to use Bay Schedule sub menu

Bay Schedule is designed to show plan (P) and actual (A) schedule of bay of each service center in the focused time interval. The schedule is shown in form of Gantt chart. The length and color of the bar represent time interval and status of the bay.

1. At main window of Job Allocation Plan Program, click menu **Job Allocation Plan** and sub menu **Bay Schedule** . The screen will show **Bay Schedule**.
2. Click **Edit**
3. At **From** field, input start date and press Enter.
4. At **To** field, input end date and press Enter.
5. At **Center** field, click the arrow. The center list will be shown. Click center

name and press Enter.

6. Wait until highlight at center field blinks. Double click at the Gantt chart and click again out of Gantt chart. The Gantt chart will show schedule of bay of selected center.
7. At **Bay No.** field, click the arrow. The list of Bay No. will be shown. Click Bay No. you want to investigate.
8. At **Job No.** field, click the arrow. The list of Job No. will be shown. Click Job No. you want to investigate.
10. Click **Close** when you want to close this screen. The screen will get back into the main window of Job Allocation Plan Program.

How to use Parts Used sub menu

Parts Used is designed to record spare parts consumed by each job. You can use this sub menu by following these steps.

1. At main window of Job Allocation Plan Program, click menu **Job Allocation Plan** and sub menu **Parts Used** . The screen will show **Parts list**.
2. Click **Edit**
3. At **Center** field, click the arrow. The center list will be shown. Click center name. List of spare parts of selected center will be shown.
4. At **Job No.** field, click the arrow. The list of Job No. will be shown. Click Job No. that you want to record consumed spare parts to
5. Click spare parts that consumed by the selected job from the top list.
6. Input quantity in the **Quantity** field and press Enter. Price of the selected parts is automatically shown in Price field.
7. Click **VV**. The selected parts will be move to shown in the bottom list.

8. Repeat 4 to 7 until complete all records of consumed spare parts.
9. Click **Close** when you want to close this screen. The screen will get back into the main window of Job Allocation Plan Program.

Cancel Parts Used change

During record parts used data, You can cancel any change by clicking **Cancel**. Then, the program will cancel any change you done in this time.

How to use Job Summary sub menu

Job Suummary is designed to show all details of a job . You can use this sub menu by following these steps.

1. At main window of Job Allocation Plan Program, click menu **Job Allocation Plan** and sub menu **Job Summary**. The screen will show **Job Summary**.
2. Click **Find**.
3. At **Search Job No.** field, click the arrow, List of Job No. will be shown. Clisk Job No. you want to view its details. Then, the screen will show data of selected job.
- 4.. In case that you want to input Other costs, You can input that data in **Other Costs** field. Then you have to click **OK**.
5. Click **Close** when you want to close this screen. The screen will get back into the main window of Job Allocation Plan Program.

Cancel Job Summary change

During record other costs data, You can cancel this record by clicking **Cancel**. Then, the program will cancel the latest costs you input in this time.

How to get into Reporting and Monitoring Menu

1. At main window of Job Allocation Plan Program. click menu **Report** . The following sub menus will be listed down

- Job Normal Report
- Job Exception Report
- Job Order Pattern Report
- Employee Report
- Bay Report
- Employee Capacity Report
- Bay Capacity Report
- Parts Used Report
- Job Summary Report

How to use Job Normal Report sub menu

Job Normal Report is designed to show details of jobs which have status of Reserved. Operating. Closed in the focused interval time. User has to input scope of interested data such as center, start date, end date, and job status. You can use this sub menu by following these steps.

1. At main window of Job Allocation Plan Program. click menu **Report** and sub menu **Job Normal Report**.
2. Click **Edit**.
3. At **Center** field, click the arrow. The center list will be shown. Click center name.
4. At **From** field, input start date and press Enter.
5. At **To** field, input end date and press Enter.

6. Click **X** in front of selected job status and press Enter. The list below will show job records of the scope.
7. If you want to print out this report into hard copy form, click **Print**.
8. Click **Close** when you want to close this screen. The screen will get back into the main window of Job Allocation Plan Program.

How to use Job Exception Report sub menu

Job Exception Report is designed to show details of jobs which have status of Can't Service, Wait, Queue and Pending in the focused interval time. User has to input scope of interested data such as center, start date, end date, and job status.

You can use this sub menu by following these steps.

1. At main window of Job Allocation Plan Program, click menu **Report** and sub menu **Job Exception Report**.
2. Click **Edit**.
3. At **Center** field, click the arrow. The center list will be shown. Click center name.
4. At **From** field, input start date and press Enter.
5. At **To** field, input end date and press Enter.
6. Click **X** in front of selected job status and press Enter. The list below will show job records of the scope.
7. If you want to print out this report into hard copy form, click **Print**.
8. Click **Close** when you want to close this screen. The screen will get back into the main window of Job Allocation Plan Program.

How to use Job Order Pattern Report sub menu

Job Order Pattern Report is designed to show proportion of pattern of jobs which have operated by each service center in the focused interval time. User has to input scope of interested data such as center, start date, and end date. You can use this sub menu by following these steps.

1. At main window of Job Allocation Plan Program, click menu **Report** and sub menu **Job Order Pattern Report**.
2. Click **Edit**.
3. At **Center** field, click the arrow. The center list will be shown. Click center name.
4. At **From** field, input start date and press Enter.
5. At **To** field, input end date and press Enter. The screen will show list jobs record of specified scope.
6. If you want to print out this report into hard copy form, click **Print**.
7. Click **Close** when you want to close this screen. The screen will get back into the main window of Job Allocation Plan Program.

How to use Employee Report sub menu

Employee Report is designed to show details of operation of employees in each service center. User has to input scope of interested data such as center and employee status. You can use this sub menu by following these steps.

1. At main window of Job Allocation Plan Program, click menu **Report** and sub menu **Employee Report**.
2. Click **Edit**.
3. At **Center** field, click the arrow. The center list will be shown. Click center name.

4. Click **X** in front of selected job status and press Enter. The list below will show employee records of the scope.
5. If you want to print out this report into hard copy form, click **Print**.
6. Click **Close** when you want to close this screen. The screen will get back into the main window of Job Allocation Plan Program.

How to use Bay Report sub menu

Bay Report is designed to show details of operation of bay in each service center. User has to input scope of interested data such as center and bay status. You can use this sub menu by following these steps.

1. At main window of Job Allocation Plan Program, click menu **Report** and sub menu **Bay Report**.
2. Click **Edit**.
3. At **Center** field, click the arrow. The center list will be shown. Click center name.
4. Click **X** in front of selected job status and press Enter. The list below will show bay records of the scope.
5. If you want to print out this report into hard copy form, click **Print**.
6. Click **Close** when you want to close this screen. The screen will get back into the main window of Job Allocation Plan Program.

How to use Employee Capacity Report sub menu

Employee Capacity Report is designed to show propotion of employee of each service center in the focused interval time. User has to input scope of interested data such as center, start date, and end date.. You can use this sub menu by followung these steps.

1. At main window of Job Allocation Plan Program, click menu **Report** and sub menu **Employee Capacity Report**.
2. Click **Edit**.
3. At **Center** field, click the arrow. The center list will be shown. Click center name.
4. At **From** field, input start date and press Enter.
5. At **To** field, input end date and press Enter. The screen will show list of employee record of specified scope.
6. If you want to print out this report into hard copy form, click **Print**.
7. Click **Close** when you want to close this screen. The screen will get back into the main window of Job Allocation Plan Program.

How to use Bay Capacity Report sub menu

Bay Capacity Report is designed to show propotion of bay of each service center in the focused interval time. User has to input scope of interested data such as center, start date, and end date. You can use this sub menu by followung these steps.

1. At main window of Job Allocation Plan Program, click menu **Report** and sub menu **Bay Capacity Report**.
2. Click **Edit**.

3. At **Center** field, click the arrow. The center list will be shown. Click center name.
4. At **From** field, input start date and press Enter.
5. At **To** field, input end date and press Enter. The screen will show list of bay record of specified scope.
6. If you want to print out this report into hard copy form, click **Print**.
7. Click **Close** when you want to close this screen. The screen will get back into the main window of Job Allocation Plan Program.

How to use Parts Used Report sub menu

Parts Used Report is designed to show list of spare parts consumed by each job. You can use this sub menu by following these steps.

1. At main window of Job Allocation Plan Program, click menu **Report** and sub menu **Parts Used Report**.
2. Click **Edit**.
3. At **Job No.** field, click the arrow. The Job No. list will be shown. Click Job No. you want to view spare parts consumed by this job. The program will show job progress, status and list of consumed spare parts.
4. If you want to print out this report into hard copy form, click **Print**.
5. Click **Close** when you want to close this screen. The screen will get back into the main window of Job Allocation Plan Program.

How to use Job Summary Report sub menu

Job Summary Report is designed to show details of jobs. You can use this sub menu by following these steps.

1. At main window of Job Allocation Plan Program, click menu **Report** and sub menu **Job Summary Report**.
2. Click **Edit**.
3. At **Job No.** field, click the arrow. The Job No. list will be shown. Click Job No. you want to view its details. The screen program will show details of selected job.
4. If you want to print out this report into hard copy form, click **Print**.
5. Click **Close** when you want to close this screen. The screen will get back into the main window of Job Allocation Plan Program.

How to get into Inventory Control Menu

1. At main window of Job Allocation Plan Program, click menu **Inventory Control Menu** . The following sub menus will be listed down
 - Spare Parts Sale
 - Transfer (Fair Share Case)
 - Transfer (Normal Case)
 - Re-order

How to use Spare Parts Sale sub menu

Spare Parts Sale sub menu is designed to record transactions of spare parts sale. When there is requirement of a customer to buy spare parts. The operator of each service center will use this form to record that transaction by the following steps:

1. At main window of Job Allocation Plan Program, click menu **Inventory Control** and sub menu **Spare Parts Sales**.

2. At **Center** field, click the arrow. The center list will be shown. Click center name and press Enter. Parts list will show list of spare parts of the selected center.
3. Click **New** to clear record box.
4. Click a **Part Number** that the customer wants to buy from Parts list.
5. Input **Quantity** in the record box. The price of this transaction will be shown in the **Price** field.
6. Click **OK**. Summation of the price will be shown in **Total Price** field.
7. Repeat step 4 to 6 until complete record of this customer.
8. Click **Close**. The screen will get back into the main window of Job Allocation Plan Program.

How to use Transfer (Fair Share Case) sub menu

Transfer (Fair Share Case) sub menu is designed to record spare part transfer transactions from head office to each service center when on hand quantity at head office of any part is less than total requirement of all service centers. The operator at head office has to check Parts should be transferred of this form before using Transfer (Normal Case). If it is empty, it means that on hand quantity at head office is greater than total requirement. He can go to use Transfer (Normal Case). On the other hand, if there are data shown in the mentioned list, it means that transferred quantity must be allocated to each service center by applying **Fair Share** technique. The operator of head office will use this form to record the transaction by the following steps:

1. At main window of Job Allocation Plan Program, click menu **Inventory Control** and sub menu **Transfer (Fair Share Case)**.

2. Click a part number in **Parts should be transferred** list and click **Transfer**.
3. Repeat step 2 until complete all parts in **Parts should be transferred** list.
4. Click **Close**. The screen will get back into the main window of Job Allocation Plan Program.

How to use Transfer (Normal Case) sub menu

Transfer (Normal Case) sub menu is designed to record spare part transfer transactions from head office to each service center. Normally, this activity is acted once a week with the transferred quantity equaled to forecasting usage rate of the next week minus current on hand quantity. The forecasting quantity is shown in the last column of parts list. However, during a week, if there is over demand greater than current on hand of any service center. This from can also be used to record this special case. The operator of head office will use this form to record the transaction by the following steps:

1. At main window of Job Allocation Plan Program. click menu **Inventory Control** and sub menu **Transfer (Normal Case)**.
2. Click a Part Number that should be transferred from Parts list. The selected Part Number and Part Name will be shown in **Parts will be transferred** box.
3. At **Transfer to** field, click the arrow. The center list will be shown. Click center name that this part will be transferred to and press Enter.
4. Input transferred quantity in **Transfer Qty.** field and press Enter.
5. Click **New** to clear **Parts will be transferred** box
6. Repeat step 2 to 5 until complete all transferred parts.
7. Click **Close**. The screen will get back into the main window of Job Allocation Plan Program.

How to use Re-order sub menu

This sub menu is designed to record re-order activity of parts that have on hand quantity at head office lower than their re-order points and record receive activity when the re-order parts have come to the head office. The operator at head office will use this form to record these transactions by the following steps:

1. Click a part number that has been already placed order to supplier in **Parts should be re-ordered** list.
2. Click **Re-order**. The selected part will be shown in **Parts on Delivery** list.
3. Repeat step 1 to 2 until complete all records.
4. Click a part number that has been delivered to head office in **Parts on Delivery** list.
5. Click **Receive**. The selected part will be disappeared from **Parts on Delivery** list and the re-ordered quantity will be added to on hand quantity of that part in the top **Parts list**.



Biography

Mr. Somkiat Udomrattanachaiyakul was born on May 20,1970 in Bangkok, Thailand. He earned Bachelor Degree in Industrial Engineering from Chulalongkorn University in 1992 and a Bachelor Degree of Business Administration, Major Marketing, from Ramkhamhaeng University in 1994. He had worked for Tri Petch Isuzu Sales Co., Ltd. as Engineer of Product Planning Office from 1992-1995 before registered as a full-time student in Engineering management Program of Regional Centre for Manufacturing Systems Engineering, Chulalongkorn University.