

A PRODUCTION SYSTEM VARIABLE CONNECTANCE MODEL

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PREFACE

Production can be defined as the Manufacture and Distribution of Goods. A system is a set of Variables so related that a change in any one of them will induce, or be induced by, a change in at least one of the others.

In building the present Production System variable connectance Model, over 200 Production system variables have been defined and classified. Details of each variable have been entered on separate classification sheets, which also show how they are related to other system variables, or in other words define their "Connectance". The model described in this book is based on the case of Engineering multi-product batch production. This is the most complex form of production. It is known that some of the variables described here are not applicable to simpler types of production. Where a variable is applicable to more than one type of production, it is expected that the connectance rules will always be the same.

The classification sheets for each variable show two types of Connectance. First they show "Limitation", or the way in which the value of one variable may limit the value of some other variable. Second they show "Induction", or the way in which a particular direction of change in one variable, will induce a particular direction of change in value in some other variable or variables.

No attempt has been made with the model to show the quantitative effects of Induction, or even to show the relative significance of different variables. It is postulated that it is possible to make general statements about direction of change, for which there is a high probability that they will always be true. In most cases it is impossible to take pairs of variables in the same way and to make general statements about the quantitative effect of changing one variable on the other.

Chapter 1 describes the model and Chapter 2 gives details of the tests used to check the entries on the classification sheets. Chapters 3 to 6 inclusive contain the classification sheets for the four main types of System Variable, and Chapter 7 describes as an example, a study made using the model to investigate the connectance of variables which affect throughput time.

It is hoped that the model will be useful: First, to Industrialists who need to find appropriate means to achieve required ends; Second, to Academics who need to find subjects for research and means to relate them to the system as a whole, and Third for Students of Management, for whom the relationship between system variables is the core of their subject.

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CHAPTER 1. A DESCRIPTION OF THE MODEL

1. INTRODUCTION

This chapter is based on a paper "A classification of Production System Variables", by J L Burbidge, which was presented at the I.F.I.P. WG5.7 conference in Vienna in September 1983, but it has been amended and expanded to bring it up to date with recent developments. It describes a new classification of Production System variables which is based on their "connectance". It examines the way in which data about system variables classified in this manner can be used in a General Model of the Production System, to predict how changes in the values of particular system variables will affect the values of other system variables.

The new classification is concerned only with "Limitations" and "Direction of change". It defines the way in which changes in the value of one variable limit or restrict the possible range of values for other variables, and it defines the way in which a given direction of change in one variable will induce a particular direction of change in some other variable, or variables. This model is not concerned with the quantitative values of these changes.

The work is based on the Premiss that: "providing one does not attempt to specify relationships in quantitative terms, it is possible to make statements about system variable connectance, which are always true, even though they may not be relevant in all Production situations". For example, the statement that "an increase in Run Quantity increases stocks" is true, even though it is irrelevant in a cement factory. This chapter studies those system variables which are relevant in multi-product Engineering batch production. As this is the most complex case in Production, it is expected that it will cover all possible variables. The problem concerning which of these variables is relevant in less complex industries, has been left for later studies.

2. DEFINITIONS

The terms used in the Study have been used in the sense given in the following definitions:

1. A SYSTEM is a set of variables so related that a change in any one of them will induce, or be induced by, a change in at least one of the others.
2. PRODUCTION is the manufacture and distribution of goods.
3. A PRODUCTION SYSTEM is a System in which the variables all have some effect on production.
4. A PARAMETER (Controllable Input Variable) is a variable to which a manager can assign an arbitrary value at will.
 - a) "System design parameters" involve a simple choice between alternatives.
 - b) "Regulatory parameters" are single variables to which a range of different values can be assigned.
5. AN INPUT VARIABLE (uncontrollable Input variable), is a variable whose value is imposed by the Environment in which the System exists and over which the manager has little or no control.
6. AN OUTPUT VARIABLE is a variable which a Manager can only alter indirectly by changing Parameter values.
7. MANAGEMENT. The planning, direction and control of the work of human beings towards the attainment of agreed objectives.
8. MANAGEMENT FUNCTIONS are sets of closely related management tasks. For the present study nine have been chosen: (1) Product design, (2) Production planning, (3) Production control, (4) Purchasing, (5) Marketing, (6) Finance, (7) Personnel, (8) Secretarial and (9) General Management.
9. CONNECTANCE. The manner in which a given change in the value of one system variable affects the value of another system variable.

The general scheme of classification for system variables, adopted for the study, is illustrated in Fig.1.1. It shows System variables divided between four main classes: System design parameters, Regulatory parameters, Uncontrollable input variables, and Output variables.

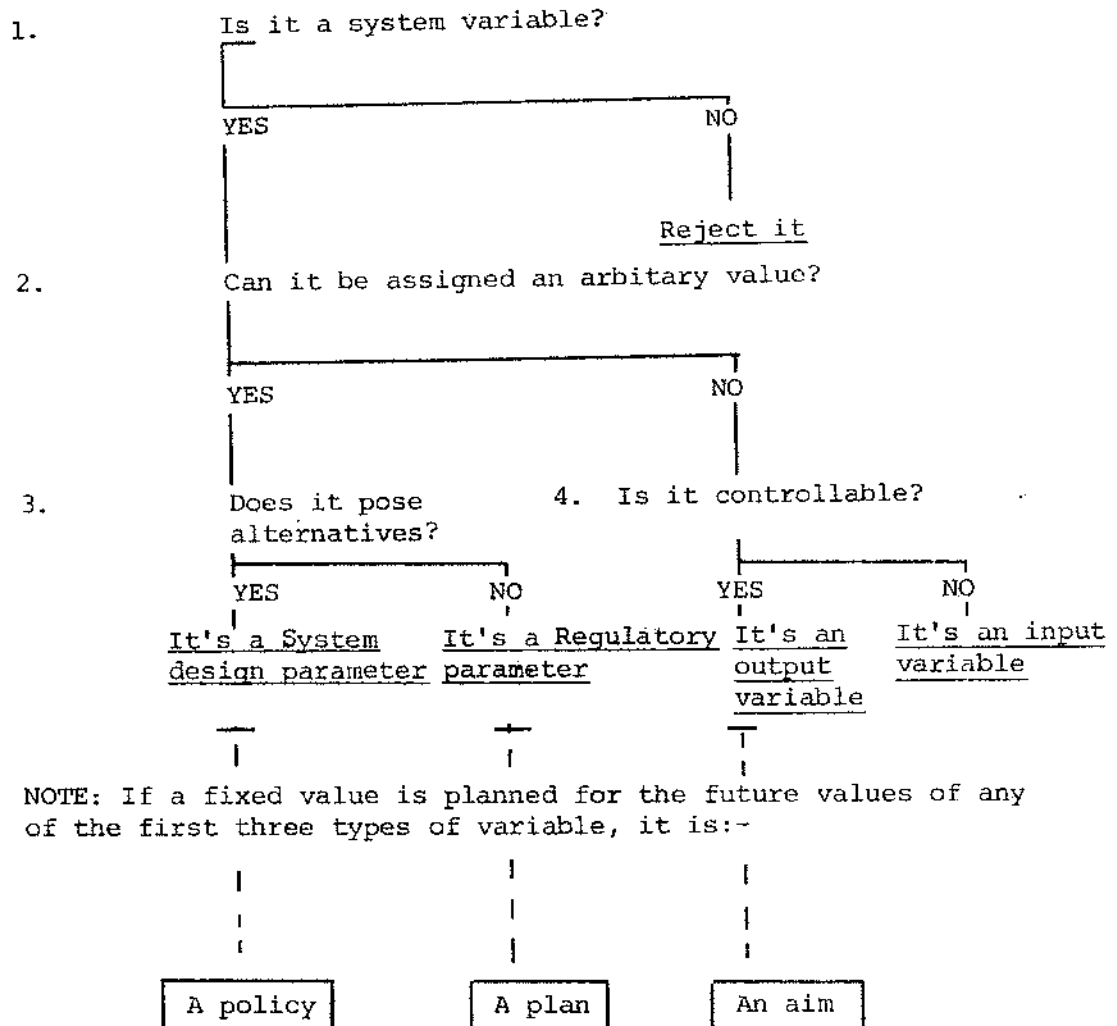


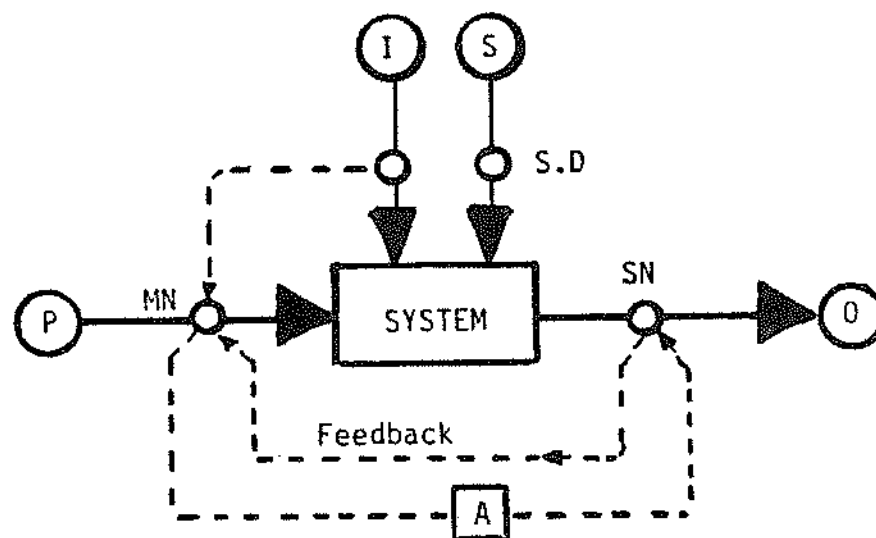
FIG.1.1 SCHEME OF CLASSIFICATION

It is postulated here that a System variable is still a "Variable" even if at a particular moment in time, it has been assigned a particular fixed value as a policy, plan, or aim for the future, or has achieved a particular fixed value in some other way.

The general model of a production system used in this study is illustrated in Fig.1.2. It shows the System, the four main types of system variable and the feedback control loop between the manager and the sensor. The mode of operation of the System is that the Manager plans the required values for the output variables, issuing his AIMS in the form of design drawings, programmes, route cards, budgets etc. In fixing these Aims, the manager takes into account the known capacity of the System and also the known, or forecast values for the Input variables. The Manager initiates Production by issuing Orders in which he assigns fixed values to many of the Parameters. (PLANS). The Manager controls Production by arranging for the Aims to be compared periodically with actual output variable values; by arranging "feedback" to keep himself informed of major variances, and by changing Parameter values, when necessary to steer actual output to keep it in line with the Aims.

The present study looks only at the direction of change in each system variable which is induced by given directions of change in other variables. It does not consider the quantitative effects of such changes.

The main difference between the model in Fig.1.2 and more conventional models found in System literature is that it separates System design parameters from other parameters, and by implication recognises that the System is not necessarily a "black box", which must be accepted without question. The way in which it is designed will affect it's efficiency. For simplicity the work of System design (SD) has been separated from operational management (MN).



KEY: MN = Manager(s)
 SD = System Designer
 S = System Design parameters
 P = Regulatory parameters
 A = Aims
 O = Output variables
 I = Uncontrollable Input Variables
 SN = Sensor

FIG.1.2 MODEL OF PRODUCTION SYSTEM

CODE	A. SYSTEM CHANGE				B. LIMITING			C. INDUCTION			
	V	CV	V	CV	V	LIMITS	CV	V	CV	V	CV
1	↑	↑	↓	↓				↑	↑	↓	↓
2	↑	↓	↓	↑				↑	↓	↓	↑
3	↑	↑	=	↑	V	Function of	CV	↑	↑	=	=
4	↑	↓	=	↓	V	Changes Min	CV	↑	↓	=	=
5	=	=	↓	↑	V	Changes Max	CV	=	=	↓	↓
6	=	=	↓	↓				=	=	↓	↑
7	↓	1st alternative for V,			↓	Applicable only to 1st Alternative	CV				
8	↑	2nd alternative for V,			↑	Applicable only to 2nd Alternative	CV				
9											
0	NO SYSTEM CHANGE					NO LIMITATION			NO INDUCTION		
KEY	↑	Change to 2nd alternative,						↑		An increase in V,	
	↑	Makes page increase in C/.						↑		Increases increase in CV.	

FIG. 1.3 CONNECTANCE CODE

4. CONNECTANCE

There are two main types of connectance:-

- 1) Limitation
- 2) Induction

a) Limitation.

In the first case of "Limitation", changes in the value of a system variable either fix the value or change the limits to the possible range of values, for some other variable or variables. Where a parameter change affects the value of any other parameter the relationship is treated as a Limitation.

b) Induction.

In the second case of "Induction", changes in the value of a system variable induce changes in the values for some other variable or variables. In the present study only direction of change in value has been considered, not the quantitative value of the change. The classification sheet for each variable (e.g. Figs.1.5, 1.6 and 1.7), shows:

1. Any other system variable with which it has direct "connectance".
2. Whether the connectance is by Limitation or by Induction.
3. The Limitation imposed on, or the direction of change induced in the related variable (CV), by a given direction of change in the variable under examination (V).

Note that the classification sheets only show:

1. Transitive relationships. They show the effect of changes in "V" on the value of "C". They do not show the effect of changes in "CV" on "V".
2. They only show first order relationships. For example with the system design variable S205 "Set-up on machine, or pre-setting", the change to pre-setting reduces "set-up time". This in turn increases work centre capacity, but as far as S205 is concerned the latter is a second order relationship and is not shown. It is shown on the classification sheet for "Set-up time".
3. When considering the connectance of a Variable (V) with another Variable (CV), it is assumed that the values of all other free variables are fixed.

c) Connectance Code

The code used to show details of the connectance is illustrated in Fig.1.3. The classification sheet for each system variable (V) gives the code numbers for any other variables (CV) with which it has connectance each ending with the two digit code number for the type of change involved. Arrows are also drawn on the classification sheets to indicate the type of change. The first arrow is for the Variable (V) and the second for the connectance variable (CV). The changes indicated by these arrows are reversible unless the arrows are ringed to show that the change is irreversible.

1. In the case where (V) is a System design variable (S), the first digit in the two digit connectance code is found at "A" in Figure 1.3. The second digit is "O" unless the code for the first digit is A7 or A8 when the code for the second digit is chosen between B7 and B8.
2. In the case where (V) is not a System design variable (S), and there is "Limiting connectance", the two figure code is derived from B, or from B and C. In the case of B1, B2, B3, B7 and B8 the second digit is "O". In the case of B4 and B5, the direction of change is indicated by choosing for the second digit the appropriate code number from "C".

3. Finally in the case again where (V) is not a system design variable (S) and there is "Inductive connectance", the first digit in the two digit connectance code, is selected from the "C" range and the second is zero "0".

5. CLASSIFICATION OF PARAMETERS

The study has shown that Production System Parameters fall conveniently into two main groups: "System design" and "Regulatory".

a) System design parameters

The system design parameters fall into nine classes, which are closely related to the Management Functions. These classes are:-

S1	System design parameter	-	Product design
S2	"	"	- Production Planning
S3	"	"	- Production control
S4	"	"	- Purchasing
S5	"	"	- Marketing
S6	"	"	- Finance
S7	"	"	- Personnel
S8	"	"	- Secretarial
S9	"	"	- General Management

The system design parameters are generally expressed as a choice between alternatives. Changes in these parameters will only be made infrequently, when a change in System design is required. Changes in system design parameters may in some cases induce a direct change in output variable values. In other cases they only alter the constraints which limit the possible range of value change for other Parameters, or Output variables.

It is comparatively simple to allocate each "System design parameter" to one of the Management functions in the manner illustrated in Fig.1.4. This does not mean that each Management function sub-system can be designed independantly, without reference to the others. This cannot be done efficiently, because connectance cannot be avoided between parameters and output variables which are allocated to different functions. A four digit code is used to cover the classes:-

1. The first digit is always "S" for System design parameter.
2. The second digit shows the Management function to which the parameter is allocated.

NB. These first two digits identify the class.

3. The third and fourth digits (0-99) give an identity number to the parameter.

A separate list is maintained of all System design parameters in each class and a classification sheet is filled in for each one. See Figure 1.5. This sheet shows the "connectance" of the variable with any other parameters or output variables. The code number used in the computer files for this parameter is:-

S205.C0330220.0680710

It was found by listing the code number for the variable (V), followed by the letter "C" denoting induced connectance, followed by the code numbers for it's two connectance variables (CV), each ending with a two digit code showing the type of connectance, (See Fig.1.3).

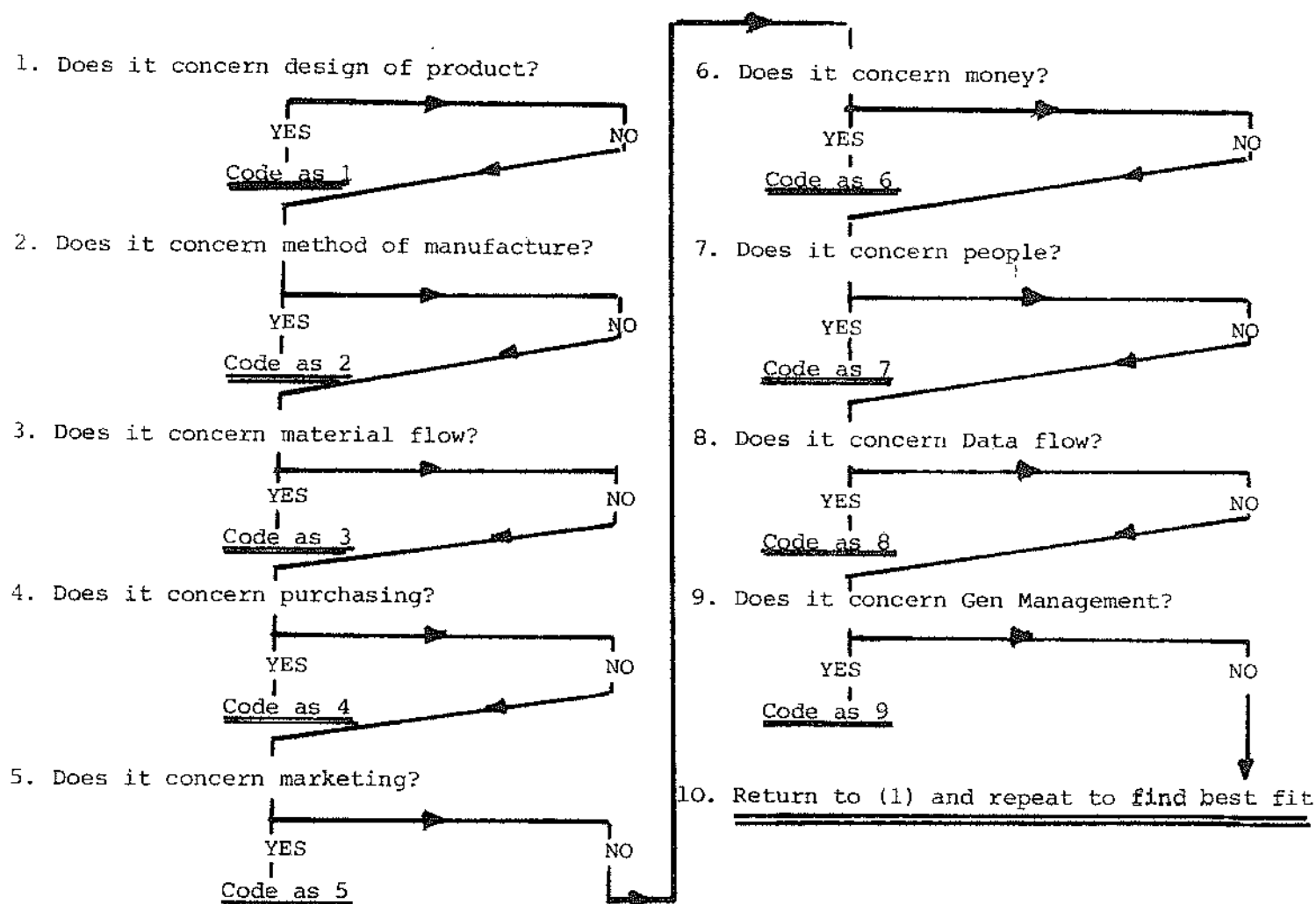


FIG.1.4 ALLOCATION TO MANAGEMENT FUNCTIONS

b) Regulatory parameters

Those parameters which are not System design parameters are called "Regulatory parameters". They can be classified in 9 classes as follows:

P1	Regulatory parameter	- Product design
P2	"	- Production Planning
P3	"	- Material flow
P4	"	- Purchase supply
P5	"	- Product distribution
P6	"	- Money flow
P7	"	- Personnel Management
P8	"	- Information flow
P9	"	- General Management

SYSTEM DESIGN PARAMETER

S 2 0 5

1. NAME,
SET-UP ON M/C, OR PRE-SETTING

2. DEFINITION,
Tooling set-up installed and adjusted on the machine, or tools pre-set in special holders off the machine.

3. FUNCTION.

1.	Product Design		6.	Finance	
2.	Production Planning	✓	7.	Personnel	
3.	Production Control		8.	Secretarial	
4.	Purchasing		9.	Gen. Manager	
5.	Marketing				

↑
2

4. LIMITATION.

5. INDUCTION.

1.	Set-up time per Op.	→ ↓	0	3	3	0	2	2	0
2.	Cost-Production planning	→ ↑	0	6	8	0	7	1	0

6. NOTES,

FIG.1.5 A SYSTEM DESIGN PARAMETER

REGULATORY PARAMETER

P 3 0 3

1. NAME,
RUN QTY - Mfgr. (R.Q).

2. DEFINITION,
The quantity of a part-run-off at a work centre before changing to produce some other part.

3. FUNCTION.

1. Product Design		6. Finance	
2. Production Planning		7. Personnel	
3. Production Control	✓	8. Secretarial	
4. Purchasing		9. Gen. Manager	
5. Marketing		0	

↑

3

4. LIMITATION.

1. Run Frequency	↑ + f v
2. Transfer quantity	↑ + max
3.	

P	3	0	4	3	2
P	3	0	5	5	1

5. INDUCTION.

1. Stocks - Total	↑ ↑
2. Throughput time (Mfgr)	↑ ↑
3.	
4.	
5.	

0	3	4	0	5	1	0
0	3	3	0	1	1	0

6. NOTES, Stock Charts demonstrate induced changes:

① 4 Runs pa of 42 = 168.
Av. stock = 36

② 12 Runs pa of 14 = 168.
Av. stock = 12

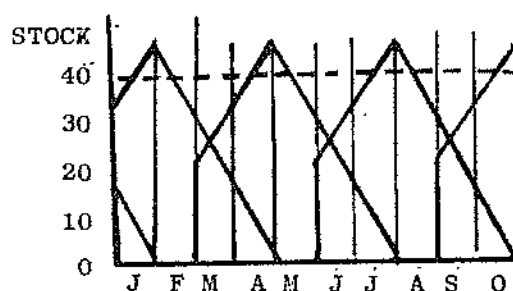
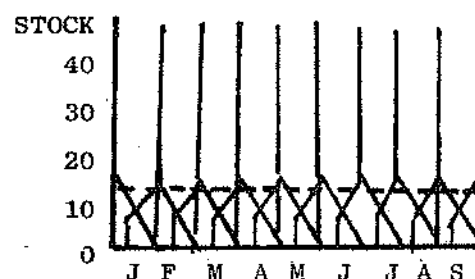


FIG. 1.6 A REGULATORY PARAMETER

The first two classes P1 and P2 cover the technological sub-systems involved in "Product design" and "Production Planning". The next three classes (P3, P4 and P5) cover parameters used to regulate material flow. The next class (P6) covers parameters used to regulate the flow of money. (P7) covers parameters used to regulate personnel relations and the Social System. (P8) covers Information Flow and Data processing and (P9) finally covers "General Management" and the Total Production System. The close relationship between these classes and the Management functions will be obvious.

A four digit code is used to cover the classes:-

1. The first digit is always "P" for regulatory parameters
2. The second digit shows the Management function to which the parameter is allocated.

NB. These first two digits identify the class.

3. The third and fourth digits (01 to 99) give an identity to the parameter

A separate list of Regulatory parameters is made for each class. In addition a classification sheet is filled in for each parameter. See Fig.1.6. This sheet shows the "connectance" of the variable with any other parameters and/or "output variables". The code number for the parameter described in Fig.1.6 is:

P303. LP30432.P30551.CO340510.0330110

It was again found by Listing the code number for the variable (V), followed by the code numbers for all it's connectance variables (CV).

6. INPUT VARIABLES

These are listed and classified in a similar manner to the Parameters. They are again divided into classes based on the management function which is most closely affected by changes in each Input Variable. A four digit code is used to cover the classes.

1. The first digit is always "I" for Input variables.
2. The second digit shows the Management function most closely concerned.

NB. These first two digits identify the class.

3. The third and fourth digits (01 to 99) given an identity number to the variables.

A separate list of Input variables is maintained for each class, and a classification sheet is filled in for each variable. Examples of Input variables include Safety Laws, Value of £, Minimum wage and the Weather.

7. CLASSIFICATION OF OUTPUT VARIABLES

The study has shown that Production System Output Variables again fall conveniently into nine main classes, which are closely related to the Management functions, to which they are again allocated in the manner illustrated in Fig.1.4. These classes are:-

- | | |
|------------------------|----------------|
| 01 Product design | 06 Finance |
| 02 Production Planning | 07 Personnel |
| 03 Production Control | 08 Secretarial |
| 04 Purchasing | 09 General |
| 05 Marketing | |

Each of these classes is subdivided into the following types, depending on the type of unit used for measurement:-

- TYPE 1. DIMENSIONS in units of length, weight, volume, hardness etc. Mainly concerned with 01 Product design.
- TYPE 2. LOAD & CAPACITY, in units of Products/period, m/c hours, manhours etc. Mainly concerned with 02 Production Planning and 03 Production Control.
- TYPE 3. TIME, in units of years, months, weeks, hours, seconds etc.

OUTPUT VARIABLE		0 3 2 0 8								
1.	NAME, CAPACITY Work Centre									
2.	DEFINITION, The time in M/c-hours or Man hours available on a machine, or other work centre type, for useful work (load), during a given period.									
3.	UNITS, Products. M/c-hours or Man hours per period									
4.	FUNCTION,									
	1	Product Design		6.	Finance					
	2	Production Plan'g		7.	Personnel					
	3	Prod. Control	✓	8.	Secretarial		3	2 = Load Cap.		
	4	Purchasing		9.	Gen.Mngt.					
	5	Marketing								
5.	LIMITATION,									
	1	Load Work Centre		↑ ↑ max		0	3	2	0	3
	2									
	3									
6.	INDUCTION,									
	1	Free capacity - work ctr.		↑ ↑		0	3	2	1	4
	2	SWITCH at Zero to:-				S	W			
	3	Overload - Work Ctr		↑ ↓		0	3	2	1	5
	4									
	5									
7.	CONTROL PLAN. OR AIM,									
	Planned w/c capacity									
8.	NOTES A reduction in "capacity - work centre", reduces free capacity (03214) until zero, when it becomes an Overload. (03215)									

FIG.1.7 AN OUTPUT VARIABLE

- TYPE 4. QUANTITY - STATE, in units of the number of items of a type at a particular moment in time.
- TYPE 5. QUANTITY - RATE, in units of the number of items of a type, accumulated in a particular period.
- TYPE 6. MONEY - STATE, in units of £'s. Mainly concerned with 06 Finance.
- TYPE 7. PEOPLE, in Psycho/Sociological measures of Motivation, Job satisfaction etc. Mainly concerned with 07 Personnel.
- TYPE 8. MONEY - RATE, in units of £'s received or expended in a period. Mainly concerned with 06 Finance.
- TYPE 9. GENERAL, in measures of System Performance such as Flexibility, Controllability and Reliability.

A five digit code is used to cover these output variable categories.

1. The first digit is always "0" (Output variable).
2. The second digit shows the Management function to which the output variable is allocated.
3. The third digit shows the "type" of output variable.

NB. The first three digits identify the class.

4. The fourth and fifth digits (01 to 99) give an identity number to each output variable.

A separate list of output variables is maintained for each class and applicable type. In addition a classification sheet is filled in for each output variable defining it and showing how it's classification code number is derived. This sheet also shows it's "connectance" with other output variables and/or parameters. See Fig.7. The code number in the computer files for the output variable in Fig.7 is:

03208L0320351.CO321410.SW.0321520

It was found by listing the code number for the Variable (V) followed by the code numbers for the ^{over}connectance variables (CV), the last one being ~~followed~~ ^{preceded} by a "switch" instruction.

8. SWITCH AND "IF"

Two special mechanisms used in the model must now be described. They are known as "SWITCHING" and "IF AND ONLY IF".

a) Switching.

SWITCHING is used if the nature of a connectance variable (CV) changes when it's value falls to zero. An example is shown in Fig.7. If "capacity - work centre" (03208) increases, "Free capacity" (03214) also increases. However, this relationship is reversible and if "Capacity - work centre" falls, so does "Free capacity" and it's value will eventually fall to zero. At this point "Free capacity" (03214) changes to "Overload" (03215). Overload is in effect negative Free capacity. The instruction to switch is included in the connectance code immediately after the ^{first}connectance variable (CV) concerned.

b) IF and only IF.

An example of "IF and ONLY IF", occurs with the Variable (V) "Throughput time". (03301). A change in throughput time always affects "Customer Service Time". (05302), "if and only if" Production is "Make to order". This relationship is again included in the connectance code immediately after the connectance variable (CV), as follows:-

INDUCTION	C
Customer Service time	↑↑ 0530 ² 110
IF AND ONLY IF	IF
Make for stock <u>or</u> to order	→ S31180

Note that in this case the connectance code used (80), is taken from the Limitation code - column B in Fig.3.

9. POLICIES PLANS AND AIMS

It will be seen in Fig.1 that if a particular value is assigned to a system variable, it becomes:-

- 1) In the case of System design parameters: A POLICY
- 2) In the case of regulatory parameters: A PLAN
- 3) In the case of Output variables: AN AIM

It is postulated here that Policies, Plans and Aims do not themselves have "connectance", which is a property restricted to System variables.

The names used for Aims are shown on the classification sheets for the output variables to which they refer. They include such names as programmes, budgets, lead times and delivery schedules. This has been done to prevent their accidental inclusion as System Variables.

This work has involved the re-defining of some of the terms used. For example "Lead time" and "Throughput time" are often used as synonyms. Here "Lead time" is used for the Aim and "Throughput time" is the name of the Output variable.

10. TECHNOLOGICAL VARIABLES.

The technological variables involved in the Product design (1) and Production Planning (2) functions, have been included in the model because without them the Production system is obviously incomplete.

The system design parameters for these functions fit the model very well, but most of the "Regulatory parameters" and "Output variables" concerned with Product and tooling design are "dimensions" which, do not have a general identity and cannot be used therefore in general statements about connectance.

These dimension variables are usually measured in the SI units of length, mass and angle and in their derivatives such as area, volume and weight. They are parameters because they are variables to which a designer can allocate arbitrary values, but few of them are completely independant variables because the designer's objectives and the laws of Physics, mean that the choice of a Value for one dimension will tend to dictate the values for several others.

The values assigned as "Plans" to these parameters are recorded in the Design drawings, Parts Lists and Material specifications for the products. These values tend to be semi-permanent being rarely changed once fixed.

The "Output variables" in the case of these technological variables are measured values for the dimensions. Feedback control - Quality control - is obtained by comparing these measured Values with the dimensions, limits and tolerances contained in the "plans". It will be noted that both increasing and reducing the value of a dimension leads to rejection if the measured value moves outside the range allowed by the limits on the dimension. It will also be seen that in the case of dimensions, the "PLANS" made when fixed values are assigned to

the Parameters, are also the "AIMS" used for Control (See Fig.1).

11.USING THE MODEL

All this information about system variables and their connectance provides the data needed for use with the General model of the Production System. The data about variables has been filed for the computer and programmes are being written to study:

- 1) What are the knock-on effects of a change in each parameter?
- 2) What combination of changes in System design variable values will give:
 - a) Minimum investment in stocks and work in progress?
 - b) Minimum cost?
 - c) Maximum profitability?
 - d) Maximum controllability?
 - e) Maximum flexibility etc?
- 3) How much connectance is there which crosses the management function boundaries?
- 4) How can one increase Factory Capacity?

As an example, Fig.1.8 shows the results achieved in answer to the question "How can one increase Factory capacity?" It found that to increase "Factory capacity" one must progressively increase the capacity of the most heavily loaded machines (or other work centres).

It then found a number of parameter changes which increase "work centre capacity", and also a number of Output variables whose values affect work centre capacity and the parameters which can be used to change them in the required direction. Fig.1.9 shows the connectance network for this example.

As a second example, one of the reasons for designing the model was to test the following hypotheses [1]:-

Hypothesis No.1. An optimum solution of the production System design problem, must be based on "Product organisation".

Hypothesis No.2. An optimum solution of the Production System design problem, must include "Single-cycle Flow control".

This work is not yet ready for publication, but programmes written to find the best ways of achieving the conditions necessary for maximum "Controllability". "Flexibility". "Profitability" and "Job Satisfaction", have all found "Product organisation" and "Single cycle ordering" as contributory features, thus supporting the hypotheses.

12.CONCLUSION

This book is based on the idea that it is possible to make statements about the relationship between production system variables for which there is a high probability that they will always be true.

It is believed that the new model based on this idea provides:

- 1) A valuable research tool
- 2) A valuable tool for the practicing industrial manager
- 3) A valuable teaching aid for Management training

Over 200 variables have been classified. There is still however a great deal to be done to develop the model. There is a need first to add more variables. There is also a need to subject all the present data about variables to logical analysis and in some cases to experimental verification. Finally the question of Relevance has still to be studied to find out how the model can be used in simpler types of Industry.

[1] Burbidge, J.L., 1983. The Design of Production Systems ICPR '83 Conference proceedings. Dept.Ind.Eng.Windsor University, Ontario, Canada (1983).

To increase.

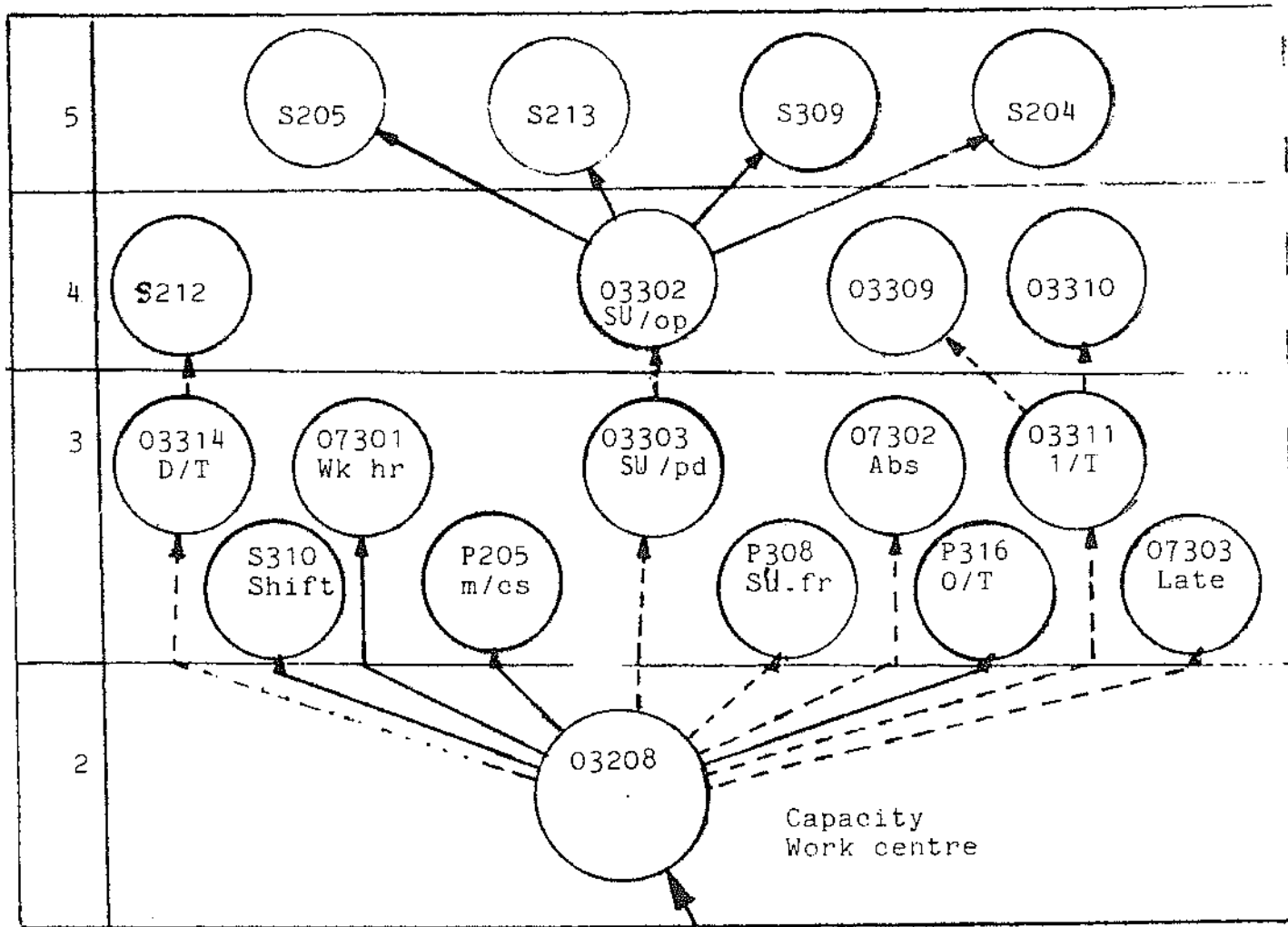
1. 03205. Capacity - Factory.

Find all work centres which have no free capacity at the required Load level and for all of them

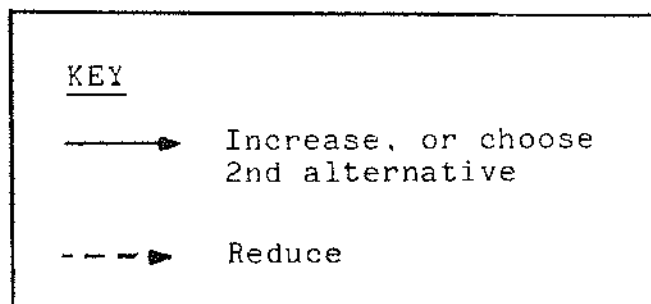
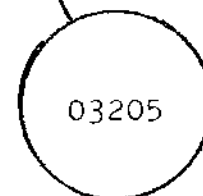
2. Increase 03208. Capacity - work centre
3. 2nd Alt. S.310 One shift or more
3. Increase P.205 No of m/cs per type
3. Reduce P.308 Set-up frequency
3. Increase P.316 Overtime
3. Reduce 03303 Set-up time/WC/period
4. Reduce 03302 Set-up time/op
5. 2nd Alt. S.205 Set-up on m/c or pre-set
5. 2nd Alt. S.213 Tool for min op: or min op + su time
5. 2nd Alt. S.309 Sched. Ops Random or Tool families
5. 2nd Alt. S.204 Tooling for parts or Families
3. Reduce 03311 Idle time total
4. Reduce 03309 Idle time - no operator
4. Reduce 03310 Idle time - waiting help
3. Reduce 03314 Down time
4. 2nd Alt. S.212 Breakdown or Preventive Maint.
3. Increase 07301 Working hours
3. Reduce 07302 Absenteeism
3. Reduce 07303 Lateness

Note: It is generally a better strategy to reduce 03302 Set-up time per Operation than to reduce set-up frequency P308.

FIG.1.8. TO INCREASE FACTORY CAPACITY



FIND ALL WORK CENTRES WHICH HAVE NO FREE CAPACITY AT THE REQUIRED LOAD LEVEL (Bottlenecks) AND FOR ALL OF THEM:



To increase Factory Capacity.

FIG.1.9 CONNECTANCE NETWORK

CHAPTER 2. TESTING THE VARIABLE CLASSIFICATION

1. INTRODUCTION

In Chapter 1 a new classification of Production system variables was described, together with the way it can be used to study the connectance between production system variables.

Over 200 Production System variables have been selected, defined, classified and coded in this way, and the results achieved have been entered on separate classification sheets for each variable.

In testing the data entered on the classification sheets, a progressive method has been used, which followed the following steps:-

- 1) Is the variable a Production System variable?
- 2) What kind of Variable is it? (e.g. Parameter, Output variable etc.)
- 3) Is it a variable, or is it a Policy, Plan or Aim?
- 4) With what Management function is it mainly concerned?
- 5) If it is an "Output variable", what is it's type?
- 6) Is the connectance transitive?
- 7) Is the connectance of first order?
- 8) Is the connectance one of Induction or Limitation?
- 9) If the connectance is by Limitation, what is the type of Limitation?
- 10) Is the connectance reversible?

This chapter gives details of the tests at each of these steps.

2. IS THE VARIABLE (V) A PRODUCTION SYSTEM VARIABLE?

- a) A system is a set of variables, so related that a change in any one of them will induce or limit, or be induced or limited by, a change of value in at least one of the other variables in the set.
- b) Production is the Manufacture and Distribution of Goods.
- c) A Production System variable is one in the set of variables which constitute a Production System.

The following questions must be asked about all potential Production System Variables:

- 1) Is the variable concerned with the manufacture and/or distribution of goods?
- 2) Does a change in the value of this Variable affect the value of any other variable?

If the answers to these questions are both YES, then the variable is a "Production System Variable". (V).

3. WHAT KIND OF SYSTEM VARIABLE IS IT?

System variables are normally classified as Parameters, Input variables and Output variables. For the present model, Parameters have been sub-divided into "System design" and "Regulatory" classes giving four main types:-

- a) System design parameters
- b) Regulatory parameters
- c) Output variables
- d) Input variables

The logic of choice is illustrated in Fig.1.1. The choice is not normally difficult.

Examples: "Stock control or Flow control" is a System design parameter, because it poses a choice between alternatives and because the Manager can make an arbitrary choice.

"Purchase order quantity" is a Regulatory Parameter because the Manager chooses a value from a range of possible values, and that is the actual value used.

"Profit" is an output variable. The Manager cannot assign it an arbitrary value. The value of Profit can only be regulated by varying the appropriate Parameter values.

The main difficulties in classifying variables by type, arise in the cases of:

- 1) Differentiation between Variables and the fixed values assigned to them from time to time as policies, plans, or Aims during production. See Section 4 ahead.
- 2) Difficulties with variables which might be either a parameter or an Output Variable. Example "Purchase price" is either:-
 - (i) An arbitrary choice between alternative quotations and is therefore a "Parameter" or is
 - (ii) the result of a given set of Input variable values (e.g. state of the economy and of the supply market) and of choosing particular Parameter Values, (e.g. the number of possible sources considered). It is therefore an "Output variable".

In this case we selected the second alternative.

4. IS (V) A VARIABLE, OR A POLICY, PLAN, OR AIM?

Parameters are by definition variables to which a manager can assign arbitrary values. As shown in Fig.1.1 these arbitrary values are called "Policies" or "Plans".

In the case of output variables the manager cannot assign arbitrary values, but he can fix targets for future output variable values which are called "Aims".

Policies, Plans and Aims are not themselves variables, and they do not have connectance.

The following question must be asked about all system variables:-

"Does the name describe, not the variable itself, but a fixed value assigned to the variable as a Policy, Plan or Aim?"

If the answer is YES, "V" is not a true System Variable.

Example: "Supply time" is the time taken by a supplier to deliver against an order. It is an "Output variable". "Lead time" is a forecast of future "supply times". It is an "Aim". It is not a System Variable.

5. WITH WHAT MANAGEMENT FUNCTION IS THE VARIABLE MAINLY CONCERNED?

The Management Functions are sets of similar Management tasks, which require similar skills and form convenient sets for Specialisation. In large companies; in Universities and Technical colleges and in Professional Institutes, these functions have become highly specialised professions. The management tasks are generally grouped into the following eight main functions, with General Management as a higher level function concerned with overall Direction and co-ordination.

- | | |
|------------------------|--------------------|
| 1) Product design | 6) Finance |
| 2) Production Planning | 7) Personnel |
| 3) Production control | 8) Secretarial |
| 4) Purchasing | 9) Gen. Management |
| 5) Marketing | 0) Spare |

The general logic and sequence of choice used to classify Production System Variables by Management function, is illustrated in Fig.1.4. Due to the close relationship of some variables, with more than one function, however, the choice in some cases has been arbitrary. For example "Is Purchasing Credit", a Purchasing variable, or a Financial variable? We chose the latter.

The advantages of this form of classification are that it provides a means for:-

- 1) Quickly finding a required variable
- 2) Studying the cross-relationships between existing Management functions.

6. IF THE (CV) VARIABLE IS AN OUTPUT VARIABLE, WHAT IS IT'S TYPE?

After classifying "Output variables" by the Management functions with which they are associated, they are then reclassified according to the type of unit used for measurement, as follows:-

- Type
1. Dimensions. (e.g. length, weight).
 2. Load and capacity (e.g. Man-hours).
 3. Time. (e.g. Hours, mins. secs).
 4. Quantity - State. (e.g. stock).
 5. Quantity - Rate. (e.g. Sales per period).
 6. Money - State. (e.g. Investment)
 7. People (e.g. Motivation)
 8. Money - Rate (e.g. Expenditure per period)
 9. General - System performance (e.g. Flexibility, Controlability, Profitability)

No difficulties have been experienced in using this classification.

The main advantages of this form of classification are that it provides a means for:-

- 1) Quickly finding a required variable
- 2) Studying the units of measurement used to measure variable values.

7. IS THE CONNECTANCE TRANSITIVE?

If a change in the variable under study (V), causes a change in, or limits the value of some other variable (CV), then the connectance is "transitive". If a change in some other variable changes the value of V, the connectance is "intransitive" as far as V is concerned.

The classification sheets used in the present model, only show transitive connectance.

Ideally one should examine all other Production System variables in turn and ask the following question:-

'Does a change in the value of V directly affect the value of this variable?'

If the answer is YES, the variable under study has Transitive connectance and should be included on the classification sheet for (V), providing that the connectance is First order.

8. IS THE CONNECTANCE OF "FIRST ORDER"?

The classification sheets for variables only show first order connectance. In other words they do not show indirect, knock-on, or "second order" relationships, where a change in the Variable (V), induces a first order change in a connectance Variable (CV), which in turn induces a second-order change in a third variable (2nd order CV).

All these relationships are included in the total model, but the classification sheets for each Variable only show first order connectance.

The following question should be asked about each variable:

"Is the connectance shown on the classification sheet of first order?"

Example

Let V = S205 "Set-up on machine, or Pre-setting" and let there be two entries for CV to be tested:-

CV(1)	0	3	3	0	2	Set up time per operation
CV(2)	0	3	2	0	8	Capacity-work centre

Assume first, that the value of CV(2) (capacity) is fixed, the change in (V) to pre-setting, will reduce set-up time. CV(1) has therefore First order connectance.

Assume second, that the value of CV(1) (Set-up time) is fixed, the change in (V) to pre-setting, will not change the capacity. CV(2) has Nil or 2nd order connectance and should not be included on the classification sheet.

9. IS THE CONNECTANCE ONE OF "INDUCTION" OR "LIMITATION"?

The following questions should be asked about all connectance variables:

1. Is the connectance variable (CV) a parameter?

If the answer is YES, the connectance is by Limitation. If NO, ask the question:

2. Does a given direction of change in the variable (V), induce a given direction of change in the connectance variable (CV)?

If the answer is YES, the connectance is by Induction. If NO, ask the question:

3. Does the value of the Variable (V) fix, or limit the possible range of values, of the connectance variable (CV)?

If the answer to YES, the connectance is by Limitation.

Example

Let V = Capacity work centre (03208), and CV = Load work centre (0.3203).

Q1. CV is not a parameter. Answer No.

Q2. No direction of change in V will induce a change in CV. Answer NO.

Q3. The value of V limits the maximum possible value of CV. Answer YES.

The connectance is therefore by LIMITATION.

10. IF THE CONNECTANCE IS BY LIMITATION, WHAT IS THE TYPE OF LIMITATION?

Seven different "Limiting" categories were planned, but only three of them have so far been needed. Two new categories have recently been added. There are now five categories:-

Cat.3 V = f CV

" 4 Change in (V) changes Min for (CV)

" 5 Change in (V) changes Max for (CV)

" 7 System change (Both V & CV are system design parameters)

" 8 " " " " " " " " " "

a) Cat.3 V = f CV

This category covers cases where (V) and (CV) are both parameters, which are intimately related. It is impossible to change one without changing the value

of the other. They are not then individually independent variables, although they may be independent Variables as a pair.

Example

Let V = run quantity

and CV = run frequency

If the values of all other variables are assumed to be fixed, - including the Requirement Quantity (03507) - then one cannot change "V" without altering the value of "CV". The connectance is therefore:-

LIMITING CONNECTANCE. Cat.30

- b) Cat.4. Both (V) and (CV) are Parameters. Change in (V) changes MIN for (CV)
The category covers cases where the value of (V) affects the Minimum possible value for (CV).

Example

Let V = Unit Load. (P208)

and CV = Transfer quantity (P305)

Increasing the quantity of components in the "Unit Load" (V), increases the Minimum possible value for Transfer quantity (CV).

LIMITING CONNECTANCE. Cat.41

Note: If both V & CV are regulatory parameters, the code is derived from Cols B(4) and C, in Fig.3. If V is a system design parameter, [^]the code is derived from Cols A and B(4).
and CV is a Regulatory Parameter,

- c) Cat.5. Both (V) and (CV) are parameters. Change in (V) changes MAX for (CV).
This category covers cases where the value of (V) affects the Maximum possible value for (CV).

Example

Let V = Number of parts per tooling family (P203).

and CV = Set-up quantity (P307).

Increasing the value of (V), increases the Maximum possible Value for (CV).

LIMITING CONNECTANCE. Cat.51

Note: If both V & CV are regulatory parameters, the code is derived from Cols B(5) and C in Fig.3. If V is a system design parameter, [^]the code is derived from Cols A and B (5).
and CV is a Regulatory Parameter,

- d) Cats.7 & 8. Both (V) and (CV) are System design parameters

Covers the four cases:-

1. 1st alternative for V, applicable only to 1st alternative (CV)
Cat 77
2. " " " ", applicable only to 2nd alternative (CV)
Cat 78
3. 2nd alternative for V, applicable only to 1st alternative (CV)
Cat 87
4. " " " ", applicable only to 2nd alternative (CV)
Cat 88

Example

Let V = Schedule ops at random or in tooling families

and CV = Individual tooling or tooling for families

The second alternative for (V) is applicable only to 2nd alternative for (CV).

LIMITING CONNECTANCE. Cat 88.

11. IS THE CONNECTANCE REVERSIBLE?

The convention has been adopted that the affect of INCREASING "V" on CV, has been examined first. In each case the question must be asked -

'Does Reducing the Value of V, reverse the direction of change in CV?'
If the answer is YES the connectance is reversible. If the answer is NO the connectance is irreversible.

CHAPTER 3 SYSTEM DESIGN PARAMETERS

1. INTRODUCTION

This chapter contains the classification sheets for a number of System design parameters.

These parameters are expressed as a choice between alternatives. The choice between them is an expression of Production Policy.

Each "System design parameter" has been assigned to the Management function with which it is most closely associated, and lists are included of the parameters assigned to each one, covering:

- S.1 System Design Parameters. Product Design
- S.2 System Design Parameters. Production Planning
- S.3 System Design Parameters. Production Control
- S.4 System Design Parameters. Purchasing
- S.5 System Design Parameters. Marketing
- S.6 System Design Parameters. Finance
- S.7 System Design Parameters. Personnel

In some of these cases only a few examples have been given and there is a need to expand the lists. In the case of S8 and S9, no lists have yet been submitted.

A classification sheet has been included for each System design parameters. These sheets show:-

1. The name of the parameter (V)
 2. It's code number
 3. It's description, or definition
 4. The name of the function to which it is assigned
 5. Any limitation imposed by (V) on any other variables (CV)
 6. Any changes in the values of other variables (CV), induced by changes in V.
- The "Connectance" found at (5) & (6) is coded.

It should be noted that the classification sheets only show Transitive connectance (the effect of V on CV, not CV on V). Also, they only show first order connectance, and when studying any pair of variables, it is assumed that the values of all other free variables are fixed.

SYSTEM DESIGN PARAMETERS

S

1

TYPE, PRODUCT DESIGN

CODE,

DESCRIPTION,

CODE,	DESCRIPTION,
S 1 0 1	Integrated, <u>or</u> Unit Assembly
0 2	Fitted, <u>or</u> Interchangeable Assemble
0 3	Special, <u>or</u> Standard parts
0 4	Special, <u>or</u> Standard materials
0 5	Many, <u>or</u> Few parts per product
0 6	Specials, <u>or</u> Variants of Standard product
0 7	Many, <u>or</u> Few products in range
0 8	Products for 1 season, <u>or</u> ^h balanced range
0 9	Manual design, <u>or</u> CAD
1 0	Repairable, <u>or</u> Sealed Assembly
1 1	No design Classification, <u>or</u> C & C
1 2	Close, <u>or</u> wide tolerances

Seasonally

SYSTEM DESIGN PARAMETER

S 1 4 0 . 1

1. NAME,
INTEGRATED, OR UNIT ASSEMBLY

2. DEFINITION, Product designed as one integrated assembly, or as a number of independant, interchangeable unit assemblies, combined to form products.

3. FUNCTION,

1	Product Design	✓	6	Finance
2	Production Plan'g		7	Personnel
3	Prod. Control		8	Secretarial
4	Purchasing		9	Gen.Mngt
5	Marketing		0	

4. LIMITATION,

1
2
3

5. INDUCTION,

1	Customer's servicing cost	→ +	0	6	8	2	6	2	0
2	Cost (Prod) - Direct Lab (Assy)	→ +	0	6	8	1	8	2	0
3	Products in range	→ +	P	1	4	0	2	2	0
4									
5									

6. NOTES,

1. Unit assembly makes it possible to introduce unit exchange and repair schemes which reduce servicing costs.

7. TYPE OF INDUSTRY

1	Process		4	Explosive	✓	4
2	Implosive		5	All		
3	Square					

A

SYSTEM DESIGN PARAMETER

S 1 4 0 2

1. NAME,
FITTED, OR INTERCHANGEABLE ASSEMBLY.

2. DEFINITION,
Fits, clearances and alignments, necessary for efficient performance, obtained by fitting, or by the manufacture of interchangeable parts.

3. FUNCTION.

1	Product Design	✓	6	Finance
2	Production Planning		7	Personnel
3	Production Control		8	Secretarial
4	Purchasing		9	Gen. Mngr
5	Marketing		0	



1

4. LIMITATION.

1

2

3

5. INDUCTION.

1	Cost(Prod) - Direct Lab (Assy)	+	+	0	6	8	1	8	2	0
2	Customer's servicing cost	+	+	0	6	8	2	6	2	0
3										
4										
5										

6. NOTES.

7 Interchangeable Assembly makes it possible to assemble, or replace parts without fitting and thus greatly reduces assembly ~~to~~ servicing costs.

4 TYPE OF INDUSTRY.

1	Process	4	Explosive	✓
2	Implosive	5	All	
3	Square			

4

SYSTEM DESIGN PARAMETER										S	1	0	4				
1.	NAME, SPECIAL, <u>OR</u> STANDARD MATERIALS																
2.	DEFINITION. The use in design of special materials (e.g. castings, forgings etc.) or of standard materials (e.g. Bar, Tube, Plate, Sheet etc.) in preferred sizes.																
3.	FUNCTION.																
	1	Product Design	✓		6	Finance											
	2	Production Planning			7	Personnel											
	3	Production Control			8	Secretarial											
	4	Purchasing			9	Gen. Mngr											
	5	Marketing			0												
4.	LIMITATION.										L						
	1																
	2																
	3																
5.	INDUCTION.										C						
	1	Cost (Prod) Dir Mtl (Component)					→	↓	0	6	8	1	7	2	0		
	2	Obsolescence Stocks & W.I.P					→	↓	0	6	6	1	3	2	0		
	3	Material waste					→	↑	0	3	5	0	3	1	0		
	4	Set-up time/period					→	↓	0	3	3	0	3	2	0		
	5																
6.	NOTES, As an example of the way in which the standardisation of materials reduce set-up time, the standardisation of bar sizes can reduce bar feed and collet changes on bar lathes.																

SYSTEM DESIGN PARAMETER						S 1 0 5																																																																									
1.	NAME, MANY, OR FEW PARTS PER PRODUCT																																																																														
2.	DEFINITION. Design of products comprising many parts, or design with few parts																																																																														
3.	FUNCTION.					<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 5%;"></td><td style="width: 25%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td></tr> <tr><td>1</td><td>Product Design</td><td>✓</td><td>6</td><td>Finance</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>2</td><td>Production Planning</td><td></td><td>7</td><td>Personnel</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>3</td><td>Production Control</td><td></td><td>8</td><td>Secretarial</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>4</td><td>Purchasing</td><td></td><td>9</td><td>Gen. Mngr</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>5</td><td>Marketing</td><td></td><td>0</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>														1	Product Design	✓	6	Finance						2	Production Planning		7	Personnel						3	Production Control		8	Secretarial						4	Purchasing		9	Gen. Mngr						5	Marketing		0																
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6.	NOTES.																																																																														

SYSTEM DESIGN PARAMETER		S 1 0 6										
1.	NAME, SPECIALS, <u>OR</u> VARIANTS OF STANDARD PRODUCT											
2.	DEFINITION. Product range consisting of different special products, <u>or</u> of variants of a standard product.											
3.	FUNCTION.											
	1	Product Design	✓	6	Finance							
	2	Production Planning		7	Personnel							
	3	Production Control		8	Secretarial							
	4	Purchasing		9	Gen.Mngr							
	5	Marketing		0								
4.	LIMITATION.					L						
	1											
	2											
	3											
5.	INDUCTION.					C						
	1	Cost(Prod) - Direct total	→	↓		0	6	8	1	9	2	0
	2	Stocks - Total	→	↓		0	3	4	0	5	2	0
	3											
	4											
	5											
6.	NOTES. With variants of a standard product, many components are common. Fewer different parts have to be made.											

SYSTEM DESIGN PARAMETER						<div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">S</div> <div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">1</div> <div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">0</div> <div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">7</div>																																																																																																								
1.	NAME, MANY, <u>OR</u> FEW PRODUCTS IN RANGE																																																																																																													
2.	DEFINITION, Product Range consists of many different products, <u>or</u> few products																																																																																																													
3.	FUNCTION.					<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>																																																																																																								
	1	Product Design	✓	6	Finance																																																																																																									
	2	Production Planning		7	Personnel																																																																																																									
	3	Production Control		8	Secretarial																																																																																																									
	4	Purchasing		9	Gen. Mngr																																																																																																									
	5	Marketing		0																																																																																																										
4.	LIMITATION.					L																																																																																																								
	1	Products/range	→ ↓	MAX		P	1	0	2	2	05																																																																																																			
	2																																																																																																													
	3																																																																																																													
5.	INDUCTION.					C																																																																																																								
	1	Stocks - Total	→ ↓			0	3	4	0	5	2	0																																																																																																		
	2	Cost(Prod). Direct Total	→ ↓			0	6	8	1	9	2	0																																																																																																		
	3																																																																																																													
	4																																																																																																													
	5																																																																																																													
6.	NOTES, Fewer products means lower buffer stocks.																																																																																																													

SYSTEM DESIGN PARAMETER						S 1 0 8						
1.	NAME, PRODUCTS FOR 1 SEASON <u>OR</u> BALANCED RANGE											
2.	DEFINITION, A Product range which can only be sold in one season or the year, <u>or</u> a balanced range, parts of which can be sold all the year round											
3.	FUNCTION.											
	1	Product Design	✓	6	Finance							
	2	Production Planning		7	Personnel							
	3	Production Control		8	Secretarial							
	4	Purchasing		9	Gen. Mngr							
	5	Marketing		0								
4.	LIMITATION.						L					
	1											
	2											
	3											
5.	INDUCTION.						C					
	1	Stocks - Total → ↓				0	3	4	0	5	3	0
	2	Obsolescence - Stocks & W.I.P → ↓				0	6	6	1	3	2	0
	3											
	4											
	5											
6.	NOTES, This problem arises with Agricultural machines, Toys, clothing and many other seasonal products.											

SYSTEM DESIGN PARAMETER						<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">S</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">1</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">9</div>						
1.	NAME, <div style="text-align: center; margin-top: 10px;">MANUAL DESIGN <u>OR</u> CAD</div>											
2.	DEFINITION, Manual design <u>or</u> Computer Aided Design											
3.	FUNCTION,											
	1	Product Design	✓	6	Finance							
	2	Production Planning		7	Personnel							
	3	Production Control		8	Secretarial							
	4	Purchasing		9	Gen. Mngr							
	5	Marketing		0								
4.	LIMITATION,					L						
	1											
	2											
	3											
5.	INDUCTION,					C						
	1	Cost (Mngt) - Prod. Design			→ ↓	0	6	8	0	6	2	0
	2	Design time			→ ↓	0	1	3	0	1	2	0
	3											
	4											
	5											
6.	NOTES,											

SYSTEM DESIGN PARAMETER		S 1 1 0										
1.	NAME, REPAIRABLE, <u>OR</u> SEALED ASSEMBLY											
2.	DEFINITION, Product designed for overhaul and repair, or designed as a sealed assembly to be replaced completely if it fails.											
3.	FUNCTION.											
	1	Product Design	/	6	Finance							
	2	Production Planning		7	Personnel							
	3	Production Control		8	Secretarial							
	4	Purchasing		9	Gen. Mngr							
	5	Marketing		0								
4.	LIMITATION.					L						
	1											
	2											
	3											
5.	INDUCTION.					C						
	1	Customer's Servicing Cost	→	↓		0	6	8	2	6	2	0
	2											
	3											
	4											
	5											
6.	NOTES.											

SYSTEM DESIGN PARAMETER						S 1 1 1						
1.	NAME, NO DESIGN CLASSIFICATION <u>OR</u> C & C											
2.	DEFINITION, No attempt to classify the designs of parts, and assemblies, <u>or</u> classification and coding of parts and Assemblies.											
3.	FUNCTION.											
	1	Product Design	✓	6	Finance							
	2	Production Planning		7	Personnel							
	3	Production Control		8	Secretarial		1					
	4	Purchasing		9	Gen. Mngr							
	5	Marketing		0								
4.	LIMITATION.						L					
	1											
	2											
	3											
5.	INDUCTION.						C					
	1	Cost (Mngt) - Prod. Design	→	↓		0	6	8	0	6	2	0
	2	Cost (Mngt) - Prodn. Plan.	→	↓		0	6	8	0	7	2	0
	3											
	4											
	5											
6.	NOTES, C & C reduces Tooling and Design costs, by making it possible to find similar parts, which use existing tools, and by making it unnecessary to design new parts.											

SYSTEM DESIGN PARAMETER										S	1	1	2							
1.	NAME, CLOSE <u>OR</u> WIDE TOLERANCES																			
2.	DEFINITION, Close tolerances on component dimensions <u>or</u> design with wider tolerances																			
3.	FUNCTION.																			
	1	Product Design	✓	6	Finance															
	2	Production Planning		7	Personnel															
	3	Production Control		8	Secretarial						1									
	4	Purchasing		9	Gen. Mngr															
	5	Marketing		0																
4.	LIMITATION.										L									
	1	Many or few parts/product					→	→	S	1	0	5	8	8						
	2																			
	3																			
5.	INDUCTION.										C									
	1	Cost (Prod.) - Direct total					→	→	0	6	8	1	9	2	0					
	2																			
	3																			
	4																			
	5																			
6.	NOTES.																			
<p>The tolerances on parts depends on the operational tolerances required for efficient product performance. Reducing the number of parts comprising an operational dimension - & its tolerance - reduces the tolerances on the component dimensions needed for interchangeability.</p>																				

SYSTEM DESIGN PARAMETERS

S

2

TYPE, PRODUCTION PLANNING

CODE,				DESCRIPTION,
S	2	0	1	Make or Buy
		0	2	Process or Product layout
		0	3	Many or Few operations per part
		0	4	Individual tooling or tooling families
		0	5	Set-up on m/c or Pre-setting
		0	6	Centralised or de-centralised tool store
		0	7	M/c paced Assembly line or groups
		0	8	Assy. groups in series or other groups
		0	9	Assy groups in parallel, or Branched
		1	0	Machining Lines, or Machining Groups
		1	1	Manual or Automatic Mtl. transfer
		1	2	Breakdown or Preventive Maintenance
		1	3	Tooling for Min.op. or Min.op. + set time
		1	4	Manual planning, or CAD-CAM
		1	5	Automated Lines, or machining centres

SYSTEM DESIGN PARAMETER				S	2	0	1				
1.	NAME, MAKE <u>OR</u> BUY										
2.	DEFINITION, The decision whether a component CAN be made <u>or</u> CANNOT be made - or be made economically - and must be bought										
3.	FUNCTION,										
	1	Product Design	6	Finance							
	2	Production Planning ✓	7	Personnel							
	3	Production Control	8	Secretarial							
	4	Purchasing	9	Gen.Mngr							
	5	Marketing	0								
4.	LIMITATION,										
	1										
	2										
	3										
5.	INDUCTION,										
	1	Value added	→	↓	0	6	8	0	4	2	0
	2										
	3										
	4										
	5										
6.	NOTES, Purchasing an item which can be made, is "sub-contracting", <u>not</u> buying										

SYSTEM DESIGN PARAMETER		S 2 0 2																																																						
1.	NAME, <u>PROCESS OR PRODUCT LAYOUT</u>																																																							
2.	DEFINITION, With Process layout machines of the same type are laid out together. With Product layout sets of m/cs which complete "families" of parts are kept together.																																																							
3.	FUNCTION,																																																							
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 35%;">Product Design</td> <td style="width: 5%;"></td> <td style="width: 5%; text-align: center;">6</td> <td style="width: 35%;">Finance</td> <td style="width: 10%;"></td> </tr> <tr> <td style="text-align: center;">2</td> <td>Production Planning ✓</td> <td></td> <td style="text-align: center;">7</td> <td>Personnel</td> <td></td> </tr> <tr> <td style="text-align: center;">3</td> <td>Production Control</td> <td></td> <td style="text-align: center;">8</td> <td>Secretarial</td> <td></td> </tr> <tr> <td style="text-align: center;">4</td> <td>Purchasing</td> <td></td> <td style="text-align: center;">9</td> <td>Gen. Mngr</td> <td></td> </tr> <tr> <td style="text-align: center;">5</td> <td>Marketing</td> <td></td> <td style="text-align: center;">0</td> <td></td> <td></td> </tr> </table>	1	Product Design		6	Finance		2	Production Planning ✓		7	Personnel		3	Production Control		8	Secretarial		4	Purchasing		9	Gen. Mngr		5	Marketing		0																											
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2	Production Planning ✓		7	Personnel																																																				
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4	Purchasing		9	Gen. Mngr																																																				
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4.	LIMITATION,																																																							
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1	Throughput time → ↓	0	3	3	0	1	2	0																																																
2	Cost (Prod) - Indirect (Hand & Store) → ↓	0	6	8	2	0	2	0																																																
3																																																								
4																																																								
5																																																								
6.	NOTES, 1. Product layout & Group layout are synonyms at shop floor level 2. See S702: Process <u>or</u> Product organisation. It has been assumed that the choice of layout, and <u>not</u> vice versa 3. Throughput time and the cost of handling & storage are reduced with Product layout, because m/cs close together all under one Manager & completed in a group <div style="display: flex; justify-content: space-between; margin-top: 10px;"> are one <div style="text-align: right;"> <p style="margin-top: 10px;">the choice of organisation type dictates</p> </div> </div>																																																							

SYSTEM DESIGN PARAMETER						<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">5</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">2</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">3</div>																																												
1.	NAME, MANY <u>OR</u> FEW OPERATIONS/PART																																																	
2.	DEFINITION, The choice between planning methods which prefer many simple ops, and those which seek to minimise the number of operations.																																																	
3.	FUNCTION.						<div style="display: flex; align-items: center; justify-content: center;"> <div style="border: 1px solid black; padding: 5px; margin: 0 10px;">2</div> <div style="font-size: 2em;">↑</div> </div>																																											
1	Product Design		6	Finance																																														
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1	Throughput time	→	↓	0	3	3	0	1	2	0																																								
2	Cost (Prod) - indirect (Hand & store)	→	↓	0	6	8	2	0	2	0																																								
3	Set-up time/w.c/period	→	↓	0	3	3	0	3	2	0																																								
6.	NOTES.																																																	

SYSTEM DESIGN PARAMETER						S 2 0 4				
1.	NAME, INDIVIDUAL TOOLING, <u>OR</u> TOOLING FOR FAMILIES									
2.	DEFINITION. Tooling designed for a particular "Op" on a part, or tooling designed for a particular "Op" on a "family" or set of similar parts									
3.	FUNCTION.									
	1	Product Design		6	Finance		<div style="text-align: center;">↑</div> <div style="border: 1px solid black; padding: 2px; display: inline-block;">2</div>			
	2	Production Planning	✓	7	Personnel					
	3	Production Control		8	Secretarial					
	4	Purchasing		9	Gen. Mngr					
	5	Marketing		0						
4.	LIMITATION.									
	1	Set-up quantity + ↑ MAX				P	3	0	7	8/15
	2									
	3									
5.	INDUCTION.									
	1	Set-up time/Op → ↓				0	3	3	0	2 2 0
	2	Cost (Mngt) - Prod. Planning → ↓				0	6	8	0	7 2 0
	3									
	4									
	5									
6.	NOTES.									

SYSTEM DESIGN PARAMETER

S 2 0 5

1. NAME, SET-UP ON M/C, OR PRE-SETTING

2. DEFINITION.

Tooling set-up installed and adjusted on the machine, or tools pre-set in special holders off the machine

3. FUNCTION.

1	Product Design		6	Finance	
2	Production Planning	✓	7	Personnel	
3	Production Control		8	Secretarial	
4	Purchasing		9	Gen. Mngr	
5	Marketing		0		



2

4. LIMITATION.

L

1		
2		
3		

5. INDUCTION.

C

1	Set-up time per Op	→	↓	0	3	3	0	2	2	0
2	Cost-Production Planning	→	↑	0	6	8	0	7	1	0
3										
4										
5										

6. NOTES.

SYSTEM DESIGN PARAMETER										S 2 0 6					
1.	NAME, CENTRALISED, <u>OR</u> DECENTRALISED TOOL STORES														
2.	DEFINITION, Tooling stored when not in use in a central store, <u>or</u> stored in the group, or by the machine where it is used.														
3.	FUNCTION.														
	1	Product Design		6	Finance										
	2	Production Planning	✓	7	Personnel										
	3	Production Control		8	Secretarial					2					
	4	Purchasing		9	Gen. Mngr										
	5	Marketing		0											
4.	LIMITATION.														
	1														
	2														
	3														
5.	INDUCTION.														
	1	Cost (Prod.) - Indirect (Hand. & St) → ↓					0	6	8	2	0	2	0		
6.	NOTES.														

SYSTEM DESIGN PARAMETER						<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">s</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">2</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">7</div>																																																																																																																		
1.	NAME, M/C PAGED ASSY LINE, <u>OR</u> GROUPS																																																																																																																							
2.	DEFINITION, A production line with a mechanised conveyor which fixes the working pace, <u>or</u> semi-autonomous Assembly groups																																																																																																																							
3.	FUNCTION.					<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>																																																																																																																		
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	2	Production Planning	✓		7	Personnel																																																																																																																		
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	3																																																																																																																							
5.	INDUCTION,					C																																																																																																																		
	1	Job satisfaction	→	↑		0	7	7	0	1	1	0																																																																																																												
	2	Througput time	→	↑		0	3	3	0	1	1	0																																																																																																												
	3																																																																																																																							
	4																																																																																																																							
	5																																																																																																																							
6.	NOTES,																																																																																																																							

SYSTEM DESIGN PARAMETER						5 2 0 8			
1.	NAME, ASSY GROUPS IN SERIES, <u>OR</u> OTHER GROUPS								
2.	DEFINITION, Groups in a line, each progressively doing part of the work, <u>or</u> groups which complete products, or major assemblies.								
3.	FUNCTION,								
	1	Product Design		6	Finance				
	2	Production Planning	✓	7	Personnel				
	3	Production Control		8	Secretarial		2		
	4	Purchasing		9	Gen. Mngr				
	5	Marketing		0					
4.	LIMITATION,								
	1								
	2								
	3								
5.	INDUCTION,								
	1	Job satisfaction	→	↑		0	7	7	0 1 1 0
	2								
	3								
	4								
	5								
6.	NOTES, There are 3 ways of forming assembly groups: 1. In series : Complex products, e.g. Volvo Kalmar 2. In parallel : Simpler, in large quantities, e.g. Phillips, Eindhoven 3. Branched : Products in unit assemblies, e.g. Olivetti, Ivrea Groups in parallel all complete the same products, Branched groups each produce a different unit Assembly.								

SYSTEM DESIGN PARAMETER						S 2 0 9						
1.	NAME, GROUPS IN PARALLEL, <u>OR</u> BRANCHED											
2.	DEFINITION, A number of groups all make the same product, <u>or</u> assembly, <u>or</u> each group makes a different product, <u>or</u> assembly.											
3.	FUNCTION,											
	1	Product Design		6	Finance							
	2	Production Planning	✓	7	Personnel							
	3	Production Control		8	Secretarial		2					
	4	Purchasing		9	Gen. Mngr							
	5	Marketing		0								
4.	LIMITATION,											
	1	Integrated <u>or</u> Unit assemblies				S	1	0	1	0	8	8
	2											
	3											
5.	INDUCTION,											
	1	Job satisfaction	→	↑		0	7	7	0	1	1	0
	2	Investment - fixed assets	→	↓		0	6	6	0	7	2	0
	3											
	4											
	5											
6.	NOTES, The Investment in fixed assets is higher with Groups in parallel, because the same machines and/or equipment must be provided for all groups.											

SYSTEM DESIGN PARAMETER				S	2	1	0
1.	NAME, MACHINING LINES, <u>OR</u> MACHINING GROUPS						
2.	DEFINITION. Planning for machining components on Lines - each station doing one operation - <u>or</u> in machining groups which allow variations in m/c usage sequences.						
3.	FUNCTION.						
	1	Product Design		6	Finance		
	2	Production Planning	✓	7	Personnel		
	3	Production Control		8	Secretarial		
	4	Purchasing		9	Gen. Mngr		
	5	Marketing		0			
4.	LIMITATION.						
	1						
	2						
	3						
5.	INDUCTION.						
	1	Obsolescence - fixed assets → ↓		0	6	6	1
	2						
	3						
	4						
	5						
6.	NOTES. Machining lines have low utility, being suitable only for very large quantities of particular parts, or of sets of parts all using the same machines in the same sequence. Machining groups are much more flexible.						

SYSTEM DESIGN PARAMETER		<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">S</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">2</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">1</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">1</div>																																			
1.	NAME, MANUAL, <u>OR</u> AUTOMATIC MATERIAL TRANSFER																																				
2.	DEFINITION, The transfer of materials between successive work stations, by human means or by some form of automatic material transfer																																				
3.	FUNCTION,																																				
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 35%;">Product Design</td> <td style="width: 5%;"></td> <td style="width: 5%; text-align: center;">6</td> <td style="width: 35%;">Finance</td> <td style="width: 5%;"></td> </tr> <tr> <td style="text-align: center;">2</td> <td>Production Planning</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">7</td> <td>Personnel</td> <td></td> </tr> <tr> <td style="text-align: center;">3</td> <td>Production Control</td> <td></td> <td style="text-align: center;">8</td> <td>Secretarial</td> <td></td> </tr> <tr> <td style="text-align: center;">4</td> <td>Purchasing</td> <td></td> <td style="text-align: center;">9</td> <td>Gen. Mngr</td> <td></td> </tr> <tr> <td style="text-align: center;">5</td> <td>Marketing</td> <td></td> <td style="text-align: center;">0</td> <td></td> <td></td> </tr> </table>	1	Product Design		6	Finance		2	Production Planning	✓	7	Personnel		3	Production Control		8	Secretarial		4	Purchasing		9	Gen. Mngr		5	Marketing		0			<div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center; margin-right: 10px;">↑</div> <div style="border: 1px solid black; padding: 2px 10px;">2</div> </div>					
1	Product Design		6	Finance																																	
2	Production Planning	✓	7	Personnel																																	
3	Production Control		8	Secretarial																																	
4	Purchasing		9	Gen. Mngr																																	
5	Marketing		0																																		
4.	LIMITATION,																																				
	1																																				
	2																																				
	3																																				
5.	INDUCTION,																																				
	1 Cost (Prod) - Direct Lab(Comp) → ↓	0	6	8	1	6	2	0																													
	2 Investment - Fixed assets → ↑	0	6	6	0	7	1	0																													
	3																																				
	4																																				
	5																																				
6.	NOTES,																																				

SYSTEM DESIGN PARAMETER						<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">S</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">2</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">1</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">2</div>																																																				
1.	NAME, BREAKDOWN, <u>OR</u> PREVENTIVE MAINTENANCE																																																									
2.	DEFINITION, Maintenance policies which iether repair m/cs when they breakdown, <u>or</u> inspect them regularly so that faults can be corrected before failure																																																									
3.	FUNCTION.					<div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center; margin-bottom: 10px;">↑</div> <div style="border: 1px solid black; padding: 2px 5px;">2</div> </div>																																																				
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5	Marketing		0																																																							
4.	LIMITATION.										<table border="1" style="width: 100%; height: 100%; border-collapse: collapse;"> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>																																															
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1	Down time	→	↓			0	3	3	1	4	2	0																																														
2																																																										
3																																																										
4																																																										
5																																																										
6.	NOTES.																																																									

SYSTEM DESIGN PARAMETER						S 2 1 3						
1.	NAME, TOOLING FOR MIN OP., <u>OR</u> MIN OP + SU TIME											
2.	DEFINITION, A tooling policy which aims only to minimise Op. times, <u>or</u> one which aims to minimise both operation times and set-up times											
3.	FUNCTION,											
	1	Product Design		6	Finance							
	2	Production Planning	✓	7	Personnel							
	3	Production Control		8	Secretarial							
	4	Purchasing		9	Gen. Mngr							
	5	Marketing		0								
4.	LIMITATION,											
	1											
	2											
	3											
5.	INDUCTION,											
	1	Set-up time/Op	→	↓		0	3	3	0	2	2	0
	2	Cost(Mngt) - Prod.Plan	→	↑		0	6	8	0	7	1	0
	3											
	4											
	5											
6.	NOTES, Second alternative tends to increase tooling cost											

SYSTEM DESIGN PARAMETER						S 2 1 4						
1.	NAME. MANUAL PRODUCTION PALNNING OR CAD-CAM											
2.	DEFINITION. Traditional methods of manual Production planning, or new methods based on Computer Aided Design and Computer Aided Manufacture.											
3.	FUNCTION.											
	1	Product Design		6	Finance							
	2	Production Planning	✓	7	Personnel							
	3	Production Control		8	Secretarial							
	4	Purchasing		9	Gen.Mngr							
	5	Marketing		0								
4.	LIMITATION.											
	1											
	2											
	3											
5.	INDUCTION.											
	1	Cost (Mngt) - Prod.Plan → ↓				0	6	8	0	7	2	0
	2											
	3											
	4											
	5											
6.	NOTES.											

PARAMETER		S	2	1	5																																																												
1.	NAME. AUTOMATED LINES, <u>OR</u> MACHINING CENTRES																																																																
2.	DEFINITION. A policy of Automation based on lines, <u>or</u> one based on the use of Machining Centres.																																																																
3.	FUNCTION.		<table border="1"> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>																																																														
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	1	Obsolescence - Fixed Ass.	→	↓	0 6 6 1 2 2 0																																																												
	2	Flexibility	→	↑	0 9 9 0 1 1 0																																																												
6.	NOTES.																																																																

SYSTEM DESIGN PARAMETERS

S

3

TYPE, PRODUCTION CONTROL

CODE,

DESCRIPTION,

CODE,	DESCRIPTION,
S 3 0 1	Stock control, or Flow Control
0 2	Multi, or Single cycle ordering
0 3	Component or List orders
0 4	Long term Forecast, or Flexible programmes
0 5	Make or sub-contract
0 6	Controlled store or Transit store
0 7	MRP, or PBC
0 8	KANBAN, or PBC
0 9	Schedule Ops at random, or in tool families
1 0	One shift, or more
1 1	Make for stock, or Make to order
1 2	Re-set, or permanent set-up

SYSTEM DESIGN PARAMETER						<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">S</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">3</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">1</div>																																																																																																																		
1.	NAME, STOCK CONTROL, <u>OR</u> FLOW CONTROL																																																																																																																							
2.	DEFINITION, A Production Control Ordering System which bases Ordering on changes in the stock level, <u>or</u> one which bases orders on Actual, or Forecast sales																																																																																																																							
3.	FUNCTION.					<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>																																																																																																																		
	1	Product Design		6	Finance																																																																																																																			
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	3	Production Control	✓	8	Secretarial																																																																																																																			
	4	Purchasing		9	Gen. Mngr																																																																																																																			
	5	Marketing		0																																																																																																																				
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5.	INDUCTION.					C																																																																																																																		
	1	Stocks - Total	→	↓		0	3	4	0	5	2	0																																																																																																												
	2	Obsolescence - Stocks	→	↓		0	6	6	1	3	2	0																																																																																																												
	3																																																																																																																							
	4																																																																																																																							
	5																																																																																																																							
6.	NOTES, Flow control reduces stocks & obsolescence, because parts are made to meet sales requirements and also indirectly, because Flow control is essential for single cycle ordering																																																																																																																							

SYSTEM DESIGN PARAMETER		<div style="display: flex; justify-content: space-around; padding: 2px;"> S 3 0 2 </div>																																											
1.	NAME, MULTI <u>OR</u> SINGLE CYCLE ORDERING																																												
2.	DEFINITION. Choice between ordering different components to different cycles, <u>or</u> ordering all components to the same cycle with common order and due dates.																																												
3.	FUNCTION.																																												
	1	Product Design	6	Finance		<div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center; margin-right: 10px;"> <div style="border: 1px solid black; padding: 2px; width: 20px; text-align: center;">3</div> </div> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table> </div>																																							
	2	Production Planning	7	Personnel																																									
	3	Production Control ✓	8	Secretarial																																									
	4	Purchasing	9	Gen. Mngr																																									
	5	Marketing	0																																										
4.	LIMITATION.																																												
	1	Set-up Qty	→ ↑	MAX		P	3	0	7	1	05																																		
	2	Stock control <u>or</u> flow control	→ →			P	3	0	1	8	8																																		
	3																																												
5.	INDUCTION.																																												
	1	Stocks - total	→ ↓			0	3	4	0	5	2																																		
	2	Obsolescence - stocks & W.I.P.	→ ↓			0	6	6	1	3	2																																		
	3	Throughput time	→ ↓			0	3	3	0	1	1																																		
	4	System Flexibility	→ ↑			0	9	9	0	1	1																																		
	5	Waiting time	→ ↓			0	3	3	1	5	2																																		
6.	NOTES. 1. Difficult to increase set-up quantity with Multi-cycle ordering - suitable parts not on order together 2. Stocks reduced, because much smaller average run quantities can be controlled efficiently 3. Obsolescence reduced because parts in products sets 4. With S.Cy. ordering, throughput time is a parameter																																												

SYSTEM DESIGN PARAMETER						S 3 0 3						
1.	NAME, COMPONENT, <u>OR</u> LIST ORDERS											
2.	DEFINITION. The choice between individual shop orders for each part and orders listing all the parts to be made in a given period of time											
3.	FUNCTION.											
	1	Product Design		6	Finance		↑ 3					
	2	Production Planning		7	Personnel							
	3	Production Control	✓	8	Secretarial							
	4	Purchasing		9	Gen. Mngr							
	5	Marketing		0								
4.	LIMITATION.											
	1	Multi, <u>or</u> single cycle ordering → →				S	3	0	2	8	8	
	2											
	3											
5.	INDUCTION.											
	1	Cost - Indirect (Prod.Cont) → ↓				0	6	8	0	8	2	0
	2											
	3											
	4											
	5											
6.	NOTES, List orders are only used efficiently with single cycle ordering (S302)											

SYSTEM DESIGN PARAMETER						<div style="display: flex; justify-content: space-around; border: 1px solid black; width: 100px;"> S304 </div>						
1.	NAME, LONG TERM FORECAST, <u>OR</u> FLEXIBLE PROGRAMME											
2.	DEFINITION. Choice between Sales & Production programmes based on forecasts for many periods ahead, <u>or</u> a series of short term programmes issued at regular intervals.											
3.	FUNCTION,											
	1	Product Design		6	Finance		<div style="display: flex; align-items: center; justify-content: center;"> <div style="border: 1px solid black; padding: 5px; margin: 0 10px;">3</div> <div style="text-align: center;">↑</div> </div>					
	2	Production Planning		7	Personnel							
	3	Production Control	✓	8	Secretarial							
	4	Purchasing		9	Gen. Mngr							
	5	Marketing		0								
4.	LIMITATION,											
	1											
	2											
	3											
5.	INDUCTION,											
	1	Obsolescence - Stocks & W.I.P. → ↓				0	6	6	1	3	2	0
	2	Stocks- Finished prod. → ↓				0	3	4	0	1	2	0
	3	System Flexibility → ↑				0	9	9	0	1	1	0
	4											
	5											
6.	NOTES, The series of short term programmes for "Flexible programming", are used to regulate component processing and some purchase deliveries. Longer term programmes are also needed for other purposes.											

SYSTEM DESIGN PARAMETER						<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">S</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">3</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">6</div>																																																																																																								
1.	NAME. CONTROLLED STORE, <u>OR</u> TRANSIT STORE																																																																																																													
2.	DEFINITION. A store in which each part is controlled as a separate item, or a store in which each periods output of parts is accumulated ready for issue in product sets to Assembly																																																																																																													
3.	FUNCTION.					<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>																																																																																																								
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	3	Production Control	8	Secretarial																																																																																																										
	4	Purchasing	9	Gen.Mngr																																																																																																										
	5	Marketing	0																																																																																																											
4.	LIMITATION.					<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>																																																																																																								
	1	Multi, <u>or</u> single cycle ordering			+ +	S	3	0	2	8	8																																																																																																			
	2																																																																																																													
	3																																																																																																													
5.	INDUCTION.					<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>																																																																																																								
	1	Cost (Prod) - Indirect (Handling & Store)			+ +	0	6	8	2	0	2	0																																																																																																		
	2																																																																																																													
	3																																																																																																													
	4																																																																																																													
	5																																																																																																													
6.	NOTES. Transit stores can only be used efficiently with single cycle ordering (S302)																																																																																																													

SYSTEM DESIGN PARAMETER		S 3 0 7										
1.	NAME. MRP, <u>OR</u> P.B.C											
2.	DEFINITION. "Materials Requirement Planning" (MRP), <u>or</u> "Period Batch Control" (P.B.C) Production Control Systems.											
3.	FUNCTION.											
1	Product Design		6	Finance		↑ 3						
2	Production Planning		7	Personnel								
3	Production Control	✓	8	Secretarial								
4	Purchasing		9	Gen. Mngr								
5	Marketing		0									
4.	LIMITATION.											
1	Multi <u>or</u> single cycle ordering → →					S	3	0	2	8	8	
2												
3												
5.	INDUCTION.											
1	Stocks - Total → ↓					0	3	4	0	5	2	0
2	Obsolescence - stocks → ↓					0	6	6	1	3	2	0
3	System Flexibility → ↑					0	9	9	0	1	1	0
4												
5												
6.	NOTES, M.R.P is based on "Explosion" from long term sales forecast and is usually mutli-cycle. P.B.C is based on Explosion from a series of short term sales programmes and is always single cycle Both M.P.P & P.B.C are Flow Control Systems.											

SYSTEM DESIGN PARAMETER						S 3 0 8						
1.	NAME, KANBAN, OR PBC											
2.	DEFINITION, Japanese Kanban, or Period Batch Control Production Control Systems											
3.	FUNCTION,											
	1	Product Design		6	Finance		↑					
	2	Production Planning		7	Personnel							
	3	Production Control	✓	8	Secretarial		3					
	4	Purchasing		9	Gen.Mngr							
	5	Marketing		0								
4.	LIMITATION,											
	1											
	2											
	3											
5.	INDUCTION,											
	1	Cost (Mngt) - Production Control → ↑				0	6	8	0	8	1	0
	2											
	3											
	4											
	5											
6.	NOTES, 1. Both Kanban & P.B.C are Flow control systems. 2. Both use Flexible programming to regulate assembly 3. Kanban orders components by automatically ordering the replacement of container loads as they move between a series of inventories. 4. Kanban is manual system (No Computer) only used for simple flow systems & mass production 5. P.B.C. better for small qty batch & jobbing. Best with computer.											

SYSTEM DESIGN PARAMETER						<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">S</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">3</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">9</div>					
1.	NAME. SCHEDULE OPS AT RANDOM, <u>OR</u> IN TOOL FAMILIES										
2.	DEFINITION. In operation scheduling, either plan sequence of ops. at random, <u>or</u> keep ops from the same tooling family together one after the other.										
3.	FUNCTION.										
	1	Product Design		6	Finance		<div style="font-size: 2em;">↑</div> <div style="border: 1px solid black; display: inline-block; padding: 2px 5px; margin-top: 10px;">3</div>				
	2	Production Planning		7	Personnel						
	3	Production Control	✓	8	Secretarial						
	4	Purchasing		9	Gen. Mngr						
	5	Marketing		0							
4.	LIMITATION.										
	1	Indiv. tools, <u>or</u> tool for families → →				S	2	0	4	8	8
	2										
	3										
5.	INDUCTION.										
	1	Set-up time/op. → ↓				0	3	3	0	2	2
	2										
	3										
	4										
	5										
6.	NOTES. Major savings can be made in set-up time, by scheduling operations on different parts, which use the same tooling & set-up on a particular machine, one after the other.										

SYSTEM DESIGN PARAMETER						S 3 1 0				
1.	NAME, ONE SHIFT, <u>OR</u> MORE									
2.	DEFINITION, One working shift (probably a Day shift), <u>or</u> two, or three working shifts.									
3.	FUNCTION.									
	1	Product Design		6	Finance					
	2	Production Planning		7	Personnel					
	3	Production Control	✓	8	Secretarial		3			
	4	Purchasing		9	Gen. Mngr					
	5	Marketing		0						
4.	LIMITATION.									
	1									
	2									
	3									
5.	INDUCTION.									
	1	Capacity - Work centre	→	↑		0	3	2	0	8 1 0
	2	Throughput time	→	↓		0	3	3	0	1 2 0
	3									
	4									
	5									
6.	NOTES.									

SYSTEM DESIGN PARAMETER										<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">S</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">3</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">1</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">1</div>				
1.	NAME, MAKE FOR STOCK, <u>OR</u> MAKE TO ORDER													
2.	DEFINITION, Products are made for stock in anticipation of sales, <u>or</u> products are only made on receipt of customer's orders													
3.	FUNCTION.													
	1	Product Design		6	Finance		<div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center; margin-bottom: 10px;">↑</div> <div style="border: 1px solid black; padding: 2px 5px;">3</div> </div>							
	2	Production Planning		7	Personnel									
	3	Production Control	✓	8	Secretarial									
	4	Purchasing		9	Gen. Mngr									
	5	Marketing		0										
4.	LIMITATION.													
	1													
	2													
	3													
5.	INDUCTION.													
	1	Stocks - finished Product				→	↓	0	3	4	0	1	2	0
	2	Customer service time				→	↑	0	5	3	0	2	1	0
6.	NOTES,													

PARAMETER		S	3	1	2
1.	NAME. RE-SET, <u>OR</u> PERMANENT SET-UP				
2.	DEFINITION. The choice for a machine between re-setting for different parts, <u>or</u> leaving it permanently set-up for one part, or tooling family.				
3.	FUNCTION.				
1	Product Design	6	Finance		
2	Production Planning	7	Personnel		
3	Production Control ✓	8	Secretarial	3	
4	Purchasing	9	Gen. Mngr		
5	Marketing	0			
4.	LIMITATION.				
1					
2					
3					
5.	INDUCTION.				
1	Set-up time/period	+	↓	0	3
				3	0
				3	2
				0	0
6.	NOTES.				

SYSTEM DESIGN PARAMETERS					S	4	
TYPE. PURCHASING							
CODE.				DESCRIPTION.			
S	4	0	1	Batch Buy, or Scheduled delivery			
		0	2	Many or Few suppliers			
		0	3	Ex Manufacture, or Stockist			
		0	4	Ex works or delivered			
		0	5	Scheduled delivery, or call-off			
		0	6	Minimum quotation, or supplier rating			
		0	7	One source per item, or More			

SYSTEM DESIGN PARAMETER				<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">S</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">4</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">1</div>							
1.	NAME. <div style="margin-left: 40px;">BATCH BUY, <u>OR</u> SCHEDULED DELIVERY</div>										
2.	DEFINITION, Each batch purchased and delivered as a single unit, <u>or</u> a number of scheduled deliveries at intervals to complete the order										
3.	FUNCTION.										
	1	Product Design	6	Finance							
	2	Production Planning	7	Personnel							
	3	Production Control	8	Secretarial							
	4	Purchasing ✓	9	Gen. Mngr							
	5	Marketing	0								
					<div style="display: flex; align-items: center; justify-content: center;"> <div style="border: 1px solid black; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin: 0 auto;">4</div> <div style="margin: 0 5px;">↑</div> </div>						
4.	LIMITATION.										
	1										
	2										
	3										
5.	INDUCTION.										
	1	Stocks - Mtls purchased	→	↓	0	3	4	0	2	2	0
6.	NOTES,										

SYSTEM DESIGN PARAMETER						<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">S</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">4</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">2</div>																																																																																																								
1.	NAME, <div style="margin-left: 100px;">MANY, <u>OR</u> FEW SUPPLIERS</div>																																																																																																													
2.	DEFINITION, <div style="margin-left: 20px;">The company deals with many different suppliers, <u>or</u> restricts their numbers</div>																																																																																																													
3.	FUNCTION,					<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>																																																																																																								
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	4	Purchasing	✓	9	Gen. Mngr																																																																																																									
	5	Marketing		0																																																																																																										
4.	LIMITATION,					<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>																																																																																																								
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	1	Cost (Mngt) - Purchasing → ↓			0	6	8	0	9	2	0																																																																																																			
	2																																																																																																													
	3																																																																																																													
	4																																																																																																													
	5																																																																																																													
6.	NOTES, <div style="margin-left: 20px;">Transport costs from suppliers can be reduced by reducing the number of suppliers. Control costs are also lower.</div>																																																																																																													

SYSTEM DESIGN PARAMETER						<div style="display: flex; justify-content: space-around; border: 1px solid black; padding: 2px;"> S 4 0 3 </div>							
1.	NAME, BUY FROM MANUFACTURER, <u>OR</u> STOCKIST												
2.	DEFINITION, Purchasing direct from the manufacturer of an item, <u>or</u> purchasing from stockists.												
3.	FUNCTION.												
	1	Product Design		6	Finance								
	2	Production Planning		7	Personnel								
	3	Production Control		8	Secretarial			4					
	4	Purchasing	✓	9	Gen.Mngr								
	5	Marketing		0									
4.	LIMITATION.												
	1												
	2												
	3												
5.	INDUCTION.												
	1	Supply time - purchases	→	↓			0	4	3	0	1	2	0
	2												
	3												
	4												
	5												
6.	NOTES, "Supply time" is the actual time taken by the supplier to deliver. "Lead time" is the plan or "Aim" for the same interval.												

SYSTEM DESIGN PARAMETER						<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">S</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">4</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">4</div>																																														
1.	NAME, EX WORKS, <u>OR</u> DELIVERED																																																			
2.	DEFINITION. Suppliers contract is completed when goods are ready for collection at his factory, <u>or</u> supplier delivers goods to customer.																																																			
3.	FUNCTION,					<div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center; margin-right: 10px;">↑</div> <div style="border: 1px solid black; padding: 5px;">4</div> </div>																																														
1	Product Design		6	Finance																																																
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3	Production Control		8	Secretarial																																																
4	Purchasing	✓	9	Gen. Mngr																																																
5	Marketing		0																																																	
4.	LIMITATION,					<table border="1" style="width: 100%; height: 100%; border-collapse: collapse;"> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>																																														
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5.	INDUCTION,					<table border="1" style="width: 100%; height: 100%; border-collapse: collapse;"> <tr><td>0</td><td>4</td><td>6</td><td>0</td><td>1</td><td>1</td><td>0</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>					0	4	6	0	1	1	0																																			
0	4	6	0	1	1						0																																									
1	Purchase Price	→	↑																																																	
6.	NOTES.																																																			

SYSTEM DESIGN PARAMETER		<div style="display: inline-block; border: 1px solid black; padding: 2px;">S</div> <div style="display: inline-block; border: 1px solid black; padding: 2px;">4</div> <div style="display: inline-block; border: 1px solid black; padding: 2px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px;">5</div>										
1.	NAME, SCHEDULED DELIVERY, OR "CALL-OFF"											
2.	DEFINITION. Supplier given schedule showing quantities to be delivered on a series of future dates, or given call-off notes at regular intervals showing next delivery quantity.											
3.	FUNCTION,											
	1	Product Design	6	Finance		<div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center; margin-right: 10px;">↑</div> <div style="border: 1px solid black; padding: 2px;">4</div> </div>						
	2	Production Planning	7	Personnel								
	3	Production Control	8	Secretarial								
	4	Purchasing	9	Gen. Mngr								
	5	Marketing	0									
4.	LIMITATION,											
	1											
	2											
	3											
5.	INDUCTION,											
	1	Stocks - Purchases	→	↓		0	3	4	0	2	2	0
	2											
	3											
	4											
	5											
6.	NOTES, Call-off is most convenient with single-cycle ordering (S302), but is also possible with multi-cycle ordering											

SYSTEM DESIGN PARAMETER						<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">S</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">4</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">6</div>						
1.	NAME, MIN QUOTE, <u>OR</u> SUPPLIER RATING											
2.	DEFINITION. The choice of supplier who quotes the minium price, <u>or</u> selection on the basis of supplier rating, when price is only one of <u>many</u> factors.											
3.	FUNCTION.											
	1	Product Design		6	Finance		<div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center; margin-bottom: 5px;">↑</div> <div style="border: 1px solid black; padding: 2px 5px; margin-top: 5px;">4</div> </div>					
	2	Production Planning		7	Personnel							
	3	Production Control		8	Secretarial							
	4	Purchasing	✓	9	Gen. Mngr							
	5	Marketing		0								
4.	LIMITATION.											
	1											
	2											
	3											
5.	INDUCTION.											
	1	Over-due purchases → ↓				0	4	4	0	1	2	0
6.	NOTES.											

SYSTEM DESIGN PARAMETER				<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">S</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">4</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">7</div>							
1.	NAME. ONE SOURCE/ITEM, <u>OR</u> MORE										
2.	DEFINITION. Buying all supplies of each item from one source, <u>or</u> having two or more sources for each item.										
3.	FUNCTION.										
	1	Product Design	6	Finance							
	2	Production Planning	7	Personnel							
	3	Production Control	8	Secretarial							
	4	Purchasing	9	Gen. Mngr							
	5	Marketing	0								
4.	LIMITATION.										
	1										
	2										
	3										
5.	INDUCTION.										
	1	Over-due purchases	→	↓	0	4	4	0	1	2	0
	2										
	3										
	4										
	5										
6.	NOTES. More than one source reduces the risk of a failure in supply due to fire, or strike at suppliers factory, or his failure from other causes.										

SYSTEM DESIGN PARAMETER

S

5

TYPE.

MARKETING

CODE.

DESCRIPTION.

S

5

0

1

0

2

0

3

Retailer, or Direct distribution
 Wholesaler - Retailer, or Retailer direct
 Down, or Up Market

SYSTEM DESIGN PARAMETER						S 5 0 1						
1.	NAME, RETAILER, <u>OR</u> DIRECT DISTRIBUTION											
2.	DEFINITION, Selling through Retailers, <u>or</u> direct to customers											
3.	FUNCTION,											
	1	Product Design		6	Finance							
	2	Production Planning		7	Personnel							
	3	Production Control		8	Secretarial							
	4	Purchasing		9	Gen. Mngr							
	5	Marketing	✓	0								
						↑						
4.	LIMITATION,											
	1											
	2											
	3											
5.	INDUCTION,											
	1	Sales Revenue	→	↑		0	6	8	0	1	1	0
	2	Demand - Variation	→	↓		0	5	4	0	1	2	0
	3											
	4											
	5											
6.	NOTES,											
	<p>With the same selling price & sales, revenues rise due to saving Retailers discount Direct distribution eliminates "Industrial Dynamics" magnification effect.</p>											

	SYSTEM DESIGN PARAMETER				S	5	0	2				
1.	NAME. WHOLESALER - RETAILER, <u>OR</u> RETAILER DIRECT											
2.	DEFINITION. Selling via Factory-Wholesaler-Retailer to customer, <u>or</u> Factory-Retailer to Customer											
3.	FUNCTION.											
	1	Product Design	6	Finance								
	2	Production Planning	7	Personnel								
	3	Production Control	8	Secretarial								
	4	Purchasing	9	Gen. Mngr								
	5	Marketing ✓	0									
4.	LIMITATION.											
	1											
	2											
	3											
5.	INDUCTION.											
	1	Sales Revenue	→	↑	0	6	8	0	1	1	0	
	2	Demand variation	→	↓	0	5	4	0	1	2	0	
	3											
	4											
	5											
6.	NOTES. With the same selling price and sales, revenues rise due to saving wholesaler's discount.											

SYSTEM DESIGN PARAMETER										<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">S</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">5</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">3</div>				
1.	NAME, DOWN, <u>OR</u> UP MARKET													
2.	DEFINITION, Selling at low prices to increase volume of sales, <u>or</u> at high prices with limited volume													
3.	FUNCTION,													
	1	Product Design		6	Finance		<div style="display: flex; align-items: center; justify-content: center;"> <div style="margin-right: 10px;">↑</div> <div style="border: 1px solid black; padding: 2px 5px;">5</div> </div>							
	2	Production Planning		7	Personnel									
	3	Production Control		8	Secretarial									
	4	Purchasing		9	Gen. Mngr									
	5	Marketing	✓	0										
4.	LIMITATION,													
	1	Selling price				→	↑ MAX	P	5	0	1	1	45	
	2													
	3													
5.	INDUCTION,													
	1	Sales - Total				→	↓	0	5	5	0	3	2	0
	2													
	3													
	4													
	5													
6.	NOTES,													

SYSTEM DESIGN PARAMETER					S	6	
TYPE, FINANCE							
CODE,					DESCRIPTION,		
S	6	0	1		Historical <u>or</u> Standard Costing		
		0	2		Total <u>or</u> Marginal Costing		
		0	3		F.I.F.O <u>or</u> L.I.F.O		
		0	4		Payback, <u>or</u> Discounted Cash Flow		
		0	5		Daywork <u>or</u> Incentive payment		

	SYSTEM DESIGN PARAMETER						<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="padding: 2px 5px;">S</td> <td style="padding: 2px 5px;">6</td> <td style="padding: 2px 5px;">0</td> <td style="padding: 2px 5px;">1</td> </tr> </table>	S	6	0	1		
S	6	0	1										
1.	NAME, HISTORICAL, <u>OR</u> STANDARD COSTING												
2.	DEFINITION. A cost control system based on recording past costs, <u>or</u> one which controls by comparing actual costs with pre-set standard costs.												
3.	FUNCTION.												
	1	Product Design	6	Finance	✓		↑						
	2	Production Planning	7	Personnel			↑						
	3	Production Control	8	Secretarial			6						
	4	Purchasing	9	Gen. Mngr									
	5	Marketing	0										
4.	LIMITATION.												
	1												
	2												
	3												
5.	INDUCTION.												
	1	Cost (Mngt) - Financial	→	↑			0	6	8	1	1	1	0
6.	NOTES.												

SYSTEM DESIGN PARAMETER						<div style="border: 1px solid black; display: inline-block; padding: 2px;">S 6 0 2</div>				
1.	NAME, TOTAL, <u>OR</u> MARGINAL COSTING									
2.	DEFINITION. A costing system based on total costs, <u>or</u> one based on Marginal costs.									
3.	FUNCTION.									
	1	Product Design		6	Finance	✓				
	2	Production Planning		7	Personnel					
	3	Production Control		8	Secretarial					
	4	Purchasing		9	Gen. Mngr					
	5	Marketing		0						
4.	LIMITATION.									
	1									
	2									
	3									
5.	INDUCTION.									
	1									
	2									
	3									
	4									
	5									
6.	NOTES.									
	<p>Marginal costing systems are similar in many respects to "Direct Costing" systems (U.S.A)</p>									

SYSTEM DESIGN PARAMETER		<div style="border: 1px solid black; display: inline-block; padding: 2px;">S</div> <div style="border: 1px solid black; display: inline-block; padding: 2px;">6</div> <div style="border: 1px solid black; display: inline-block; padding: 2px;">0</div> <div style="border: 1px solid black; display: inline-block; padding: 2px;">3</div>										
1.	NAME, F.I.F.O, OR L.I.F.O											
2.	DEFINITION. Method of valueing stocks, using the value of the First in (F.I.F.O), <u>or</u> using the value of the last to arrive in stock (L.I.F.O)											
3.	FUNCTION.											
	1	Product Design		6	Finance	✓						
	2	Production Planning		7	Personnel							
	3	Production Control		8	Secretarial							
	4	Purchasing		9	Gen.Mngr							
	5	Marketing		0								
4.	LIMITATION.											
	1											
	2											
	3											
5.	INDUCTION.											
	1	Revnuce	→	↑		0	6	8	0	1	1	0
	2	Profit	→	↑		0	6	8	0	3	1	0
	3											
	4											
	5											
6.	NOTES. With inflation, pricing based on LIFO costs tends to increase revenue & profit.											

SYSTEM DESIGN PARAMETER						<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">S</td> <td style="width: 20px; text-align: center;">6</td> <td style="width: 20px; text-align: center;">0</td> <td style="width: 20px; text-align: center;">4</td> </tr> </table>				S	6	0	4
S	6	0	4										
1.	NAME, PAYBACK, <u>OR</u> DISCOUNTED CASH FLOW.												
2.	DEFINITION. Method of assessing the profitability of an investment by time required to pay-back investment from profits, or method using discounted cash flow (D.C.F)												
3.	FUNCTION.												
	1	Product Design		6	Finance	✓							
	2	Production Planning		7	Personnel								
	3	Production Control		8	Secretarial								
	4	Purchasing		9	Gen. Mngr								
	5	Marketing		0									
4.	LIMITATION.												
	1												
	2												
	3												
5.	INDUCTION.												
	1												
	2												
	3												
	4												
	5												
6.	NOTES.												

	SYSTEM DESIGN PARAMETER										S	6	0	5	
1.	NAME, DAYWORK, <u>OR</u> INCENTIVE PAYMENT														
2.	DEFINITION, Payment for work which is based on attendance <u>or</u> on the work done														
3.	FUNCTION,														
	1	Product Design		6	Finance	✓									
	2	Production Planning		7	Personnel										
	3	Production Control		8	Secretarial				6						
	4	Purchasing		9	Gen. Mngr										
	5	Marketing		0											
4.	LIMITATION,														
	1														
	2														
	3														
5.	INDUCTION,														
	1	Cost (Mngt) - Finance		→	↑		0	6	8	1	1	1	0		
6.	NOTES,														

SYSTEM DESIGN PARAMETER					S	7	
TYPE,					PERSONNEL		
CODE,					DESCRIPTION,		
S	7	0	1		Centralisation or Delegation		
		0	2		Process or <u>Product</u> organisation		
		0	3		Large <u>or</u> small organisational units		

SYSTEM DESIGN PARAMETER						S 7 0 1				
1.	NAME. CENTRALISATION, <u>OR</u> DELEGATION									
2.	DEFINITION. Most decisions made by senior managers, or by "Head Office", <u>or</u> most decision making delegated to those who do the work.									
3.	FUNCTION.									
	1	Product Design		6	Finance					
	2	Production Planning		7	Personnel	✓				
	3	Production Control		8	Secretarial		7			
	4	Purchasing		9	Gen. Mngr					
	5	Marketing		0						
4.	LIMITATION.									
	1									
	2									
	3									
5.	INDUCTION.									
	1	Job satisfaction	→	↑		0	7	7	0	1 1 0
	2	Cost - Indirect total	→	↓		0	6	8	2	4 2 0
	3									
	4									
	5									
6.	NOTES. In Production, delegation is normally to the Supervisor and covers such tasks as operation scheduling, inspection, setting-up, planning overtime, etc.									

SYSTEM DESIGN PARAMETER						<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">S</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">7</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">2</div>						
1.	NAME, PROCESS, <u>OR</u> PRODUCT ORGANISATION											
2.	DEFINITION, Either organisation into units which specialise in processes, <u>or</u> units which complete products, or sets (families) of similar components											
3.	FUNCTION,											
	1	Product Design		6	Finance		7	<div style="text-align: center;">↑</div> <div style="border: 1px solid black; padding: 2px; margin: 5px auto; width: 20px;">7</div>				
	2	Production Planning		7	Personnel	✓						
	3	Production Control		8	Secretarial							
	4	Purchasing		9	Gen. Mngr							
	5	Marketing		0								
4.	LIMITATION,											
	1											
	2											
	3											
5.	INDUCTION,											
	1	Througput time	→	↓		0	3	3	0	1	2	0
	2	Scrap	→	↓		0	3	5	0	2	2	0
	3											
	4											
	5											
6.	NOTES, Throughput times and scrap are reduced because all operations on parts, or on assemblies are controlled by the same Manager.											

SYSTEM DESIGN PARAMETER						S 7 0 3							
1.	NAME, LARGE, <u>OR</u> SMALL ORGANISATIONAL UNITS												
2.	DEFINITION, Large companies, factories, departments and sections, or groups <u>or</u> small units.												
3.	FUNCTION,												
	1	Product Design		6	Finance		↑ 7						
	2	Production Planning		7	Personnel	✓							
	3	Production Control		8	Secretarial								
	4	Purchasing		9	Gen. Mngr								
	5	Marketing		0									
4.	LIMITATION,												
	1												
	2												
	3												
5.	INDUCTION,												
	1	Job satisfaction	→	↑			0	7	7	0	1	1	0
	2												
	3												
	4												
	5												
6.	NOTES, The incidence of strikes is higher in large units than in small units												

CHAPTER 4 REGULATORY PARAMETERS

1. INTRODUCTION

This chapter contains the classification sheets for a number of Regulatory parameters.

Within certain limits these Regulatory parameter values can be varied ^{independantly} over a wide range. These parameter values are changed by Managers as a means to regulate the values of the output variables, in order to achieve required Aims.

Each Regulatory parameter has been assigned to the Management function with which it is most closely associated, and lists are included of the parameters assigned to each one, covering -

- P1. Regulatory parameters. Product Design
- P2. Regulatory parameters. Production Planning
- P3. Regulatory parameters. Production Control
- P4. Regulatory parameters. Purchasing
- P5. Regulatory parameters. Marketing
- P6. Regulatory parameters. Finance
- P7. Regulatory parameters. Personnel

In some of these cases only a few examples have been given and there is a need for expansion of the lists. In the case of P8 and P9, no lists have yet been submitted.

A classification sheet has been included for each parameter, showing:

- 1. The name of the parameter (V)
- 2. It's code number
- 3. It's description or definition
- 4. The name of the function concerned
- 5. Limitations imposed by (V) on other variables (CV)
- 6. Changes induced by (V) in other variables (CV)

The "connectance" found at (5) and (6) is coded.

When studying any pair of variables, it is assumed that the values of all other free variables are fixed. It should be noted that the classification sheets only show Transitive connectance. (The effect of (V) on (CV) not of (CV) on (V). They also only show "first order" connectance.

REGULATORY PARAMETER					P	1	
TYPE, PRODUCT DESIGN							
CODE,					DESCRIPTION,		
P	1	0	1		Parts per product		
		0	2		Products in range		
		0	3		Standard parts/product		
		0	4		Tolerances on dimensions		

PARAMETER		P I O I									
1.	NAME. PARTS/PRODUCT										
2.	DEFINITION. The number of different parts per product										
3.	TYPE OF INDUSTRY. 1 PROCESS 2 IMPLOSION 3 SQUARE 4 RECTANGULAR	-	-	-	-	-	-	-	-	-	1000
24	FUNCTION.										
1	Product Design	✓	6	Finance							
2	Production Planning		7	Personnel							
3	Production Control		8	Secretarial		1					
4	Purchasing		9	Gen. Mngr							
5	Marketing		0								
45	LIMITATION.										
1											
2											
3											
56	INDUCTION.										
1	Total cost	↑	↑		0	6	8	2	5	1	0
2											
3											
4											
5											
87	NOTES.										

PARAMETER		P 1 0 2																																																																																																									
1.	NAME, PRODUCTS/RANGE																																																																																																										
2.	DEFINITION, The number of different products in the product range of a company																																																																																																										
3.	FUNCTION,																																																																																																										
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;">1</td> <td style="width: 35%;">Product Design</td> <td style="width: 5%; text-align: center;">✓</td> <td style="width: 5%;">6</td> <td style="width: 30%;">Finance</td> <td style="width: 20%;"></td> </tr> <tr> <td>2</td> <td>Production Planning</td> <td></td> <td>7</td> <td>Personnel</td> <td></td> </tr> <tr> <td>3</td> <td>Production Control</td> <td></td> <td>8</td> <td>Secretarial</td> <td></td> </tr> <tr> <td>4</td> <td>Purchasing</td> <td></td> <td>9</td> <td>Gen. Mngr</td> <td></td> </tr> <tr> <td>5</td> <td>Marketing</td> <td></td> <td>0</td> <td></td> <td></td> </tr> </table>	1	Product Design	✓	6	Finance		2	Production Planning		7	Personnel		3	Production Control		8	Secretarial		4	Purchasing		9	Gen. Mngr		5	Marketing		0			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>																																																																											
1	Product Design	✓	6	Finance																																																																																																							
2	Production Planning		7	Personnel																																																																																																							
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5	Marketing		0																																																																																																								
4.	LIMITATION,																																																																																																										
	1																																																																																																										
	2																																																																																																										
	3																																																																																																										
5.	INDUCTION,																																																																																																										
	1	Cost (Mngt) - Prod. design	↑	↑	0	6	8	0	6	1	0																																																																																																
	2	Cost (Mngt) - Prod.Planning	↑	↑	0	6	8	0	7	1	0																																																																																																
6.	NOTES,																																																																																																										

PARAMETER		P 1 0 3																																																																
1.	NAME.	STANDARD PARTS PER PRODUCT																																																																
2.	DEFINITION.	The number of different standard parts in a product																																																																
3.	FUNCTION.	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;">1</td> <td style="width: 30%;">Product Design</td> <td style="width: 5%;">/</td> <td style="width: 5%;">6</td> <td style="width: 30%;">Finance</td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> </tr> <tr> <td>2</td> <td>Production Planning</td> <td></td> <td>7</td> <td>Personnel</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>Production Control</td> <td></td> <td>8</td> <td>Secretarial</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>Purchasing</td> <td></td> <td>9</td> <td>Gen.Mngr</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td>Marketing</td> <td></td> <td>0</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>										1	Product Design	/	6	Finance							2	Production Planning		7	Personnel							3	Production Control		8	Secretarial							4	Purchasing		9	Gen.Mngr							5	Marketing		0							
1	Product Design	/	6	Finance																																																														
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5	Marketing		0																																																															
4.	LIMITATION.	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;">1</td> <td style="width: 30%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 30%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>										1											2											3																																
1																																																																		
2																																																																		
3																																																																		
5.	INDUCTION.	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;">1</td> <td style="width: 30%;">Cost (Prod.) - Total</td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 30%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>										1	Cost (Prod.) - Total																																																					
1	Cost (Prod.) - Total																																																																	
6.	NOTES.																																																																	

PARAMETER		P 1 0 4								
1.	NAME. TOLERANCES ON DIMENSIONS									
2.	DEFINITION. The tolerances allowed by a designer on the dimensions he assigns to his products									
3.	FUNCTION.									
	1	Product Design	✓	6	Finance					
	2	Production Planning		7	Personnel					
	3	Production Control		8	Secretarial					
	4	Purchasing		9	Gen. Mngr					
	5	Marketing		0						
4.	LIMITATION.									
	1									
	2									
	3									
5.	INDUCTION.									
	1	Cost (Prod) - Total		↑	↓	0	6	8	2	5
	2									
	3									
	4									
	5									
6.	NOTES. The main parameters to which the designer assigns arbitrary values during design are the dimensions of his products. It is impossible to make general statements about dimensions as a class. The designer does however have some freedom to assign arbitrary values to the tolerances and dimensions, and it is possible to generalise about tolerances.									

REGULATORY PARAMETER					P	2	
TYPE. PRODUCTION PLANNING							
CODE.				DESCRIPTION.			
P	2	0	1	Number of operations per part			
		0	2	Number of tooling families/m/c			
		0	3	Different parts/tooling family			
		0	4	Parts/Mtl.processing unit			
		0	5	Number of machines/type			
		0	6	M/c speed			
		0	7	M/c feed			
		0	8	Unit Load			

PARAMETER		P	2	0	1
1.	NAME, NO. OPS/PART				
2.	DEFINITION. The number of different processing operations used to make a part				
3.	FUNCTION.				
1	Product Design		6	Finance	
2	Production Planning ✓		7	Personnel	
3	Production Control		8	Secretarial	
4	Purchasing		9	Gen. Mngr	
5	Marketing		0		
4.	LIMITATION.				
1					
2					
3					
5.	INDUCTION.				
1	Throughput time ↑ ↑	0	3	3	0
6.	NOTES.				

PARAMETER		P 2 0 2										
1.	NAME. NO. TOOLING FAMILIES/M/c											
2.	DEFINITION. The number of sets of parts, each using the same set of tools on a particular machine.											
3.	FUNCTION.											
1	Product Design		6	Finance								
2	Production Planning	✓	7	Personnel								
3	Production Control		8	Secretarial								
4	Purchasing		9	Gen. Mngr								
5	Marketing		0									
4.	LIMITATION.											
1												
2												
3												
5.	INDUCTION.											
1	Set-up time/Op.	↑	↓			0	3	3	0	2	2	0
2	Cost (Mngt) - Prod. plan	↑	↓			0	6	8	0	7	2	0
6.	NOTES.											

PARAMETER		P	2	0	3			
1.	NAME, PARTS/TOOLING FAMILY							
2.	DEFINITION, The number of different parts per tooling family							
3.	FUNCTION,							
1	Product Design	6	Finance					
2	Production Planning ✓	7	Personnel					
3	Production Control	8	Secretarial					
4	Purchasing	9	Gen. Mngr					
5	Marketing	0						
4.	LIMITATION,							
1	Set-up qty. ↑ ↓ Max	P	3	0	7	5	1	
2								
3								
5.	INDUCTION,							
1	Set-up time/Op. ↑ ↓	0	3	3	0	2	2	0
2	Cost (Mngt) - Prod. Plan ↑ ↓	0	6	8	0	7	2	0
6.	NOTES,							

PARAMETER		P 2 0 4										
1.	NAME, PARTS/Mtl. PROCESSING UNIT											
2.	DEFINITION, No. of parts machined together as a single unit, for one or more operations and then divided for further processing, assembly or sale.											
3.	FUNCTION,											
1	Product Design		6	Finance		↑ 2						
2	Production Planning ✓		7	Personnel								
3	Production Control		8	Secretarial								
4	Purchasing		9	Gen. Mngr								
5	Marketing		0									
4.	LIMITATION,											
1												
2												
3												
5.	INDUCTION,											
1	Cost - Total		↑	↓		0	6	8	2	5	2	0
6.	NOTES,											

PARAMETER		P 2 0 6										
1.	NAME. M/C SPEED											
2.	DEFINITION.											
3.	FUNCTION.											
1	Product Design		6	Finance		↑ 2						
2	Production Planning ✓		7	Personnel								
3	Production Control		8	Secretarial								
4	Purchasing		9	Gen. Mngr								
5	Marketing		0									
4.	LIMITATION.											
1												
2												
3												
5.	INDUCTION.											
1	Operation time/Op.	↑	↓			0	3	3	0	5	2	0
2												
3												
4												
5												
6.	NOTES.											

PARAMETER		P	2	0	7
1.	NAME, M/C FEED				
2.	DEFINITION,				
3.	FUNCTION.				
1	Product Design	6	Finance		
2	Production Planning ✓	7	Personnel		
3	Production Control	8	Secretarial	2	
4	Purchasing	9	Gen. Mngr		
5	Marketing	0			
4.	LIMITATION.				
1					
2					
3					
5.	INDUCTION.				
1	Operation time/Op. ↑ ↓	0	3	3	0
2					
3					
4					
5					
6.	NOTES.				

PARAMETER		P 2 0 8										
1.	NAME. UNIT LOAD											
2.	DEFINITION. The number of parts moved and stored together as a unit											
3.	FUNCTION.											
1	Product Design		6	Finance		↑ 2						
2	Production Planning ✓		7	Personnel								
3	Production Control		8	Secretarial								
4	Purchasing		9	Gen. Mngr								
5	Marketing		0									
4.	LIMITATION.											
1	Transfer qty	Min	↑	↑		P	3	0	5	4	1	
2												
3												
5.	INDUCTION.											
1	Cost (Prod) - Indirect (Handling)	↑	↑			0	6	8	2	0	2	0
2												
3												
4												
5												
6.	NOTES. Unit Loads are normally associated each with a particular standard or special container											

REGULATORY PARAMETER					P	3	
TYPE.					PRODUCTION CONTROL		
CODE.					DESCRIPTION.		
P	3	0	1		Order Quantity		
		0	2		Order Frequency		
		0	3		Run Qty		
		0	4		Run Frequency		
		0	5		Transfer Qty		
		0	6		Transfer Frequency		
		0	7		Set-up Qty		
		0	8		Set-up Frequency		
		0	9		Ordering period (Single cycle ordering)		
		1	0		Programme term (Fixed programme)		
		1	1		Buffer stock -Finished products		
		1	2		" " Finished components - made		
		1	3		" " Finished components - bought		
		1	4		" " Materials		
		1	5		Sub-contracted - No of parts		
		1	6		Overtime		

PARAMETER		P	3	0	1			
1.	NAME, ORDER QTY - Mfgr. (O.Q)							
2.	DEFINITION, <i>quantity</i> The number of a part authorised for manufacture by the issue of a shop order							
3.	FUNCTION.							
1	Product Design	6	Finance					
2	Production Planning	7	Personnel					
3	Production Control ✓	8	Secretarial	3				
4	Purchasing	9	Gen. Mngr					
5	Marketing	0						
4.	LIMITATION.							
1	Order frequency V=fcv. ↑ ↓	P	3	0	2	3	2	
2	Run quantity Max ↑ ↑							
3								
5.	INDUCTION.							
1	Cost (Mngt) - Prod Control ↑ ↓	0	6	8	0	8	2	0
2								
3								
4								
5								
6.	NOTES, Increasing Order quantities reduced ordering costs (06807) Order quantity & Run quantity If the Requirement quantity is fixed, the order quantity is a direct function of the order frequency.							

PARAMETER		P	3	0	2																																																												
1.	NAME, ORDER FREQUENCY -Mfgr																																																																
2.	DEFINITION, The number of shop orders issued per year for a particular item																																																																
3.	FUNCTION,																																																																
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PARAMETER		P	3	0	4			
1.	NAME, RUN FREQUENCY - Mfgr							
2.	DEFINITION. The number of runs per year for a particular item							
3.	FUNCTION.							
1	Product Design	6	Finance					
2	Production Planning	7	Personnel					
3	Production Control ✓	8	Secretarial	3				
4	Purchasing	9	Gen. Mngr					
5	Marketing	0						
4.	LIMITATION.							
1	Run quantity ↑ ↓ $v = fcv$	P	3	0	3	3	2	
2								
3								
5.	INDUCTION.							
1	Stocks - Total ↑ ↓	0	3	4	0	5	2	0
2	Sensitivity ↑ ↑	0	9	9	0	4	1	0
3	Set-up time/period ↑ ↑	0	3	3	0	3	1	0
4								
5								
6.	NOTES, If the requirement quantity is fixed, the run frequency is a direct function of the run quantity.							

PARAMETER		P 3 0 5								
1.	NAME, TRANSFER QTY - Mfgr (T.Q)									
2.	DEFINITION, The quantity of parts transferred as a batch between the work centres for successive operations.									
3.	FUNCTION,									
1	Product Design		6	Finance						
2	Production Planning		7	Personnel						
3	Production Control	✓	8	Secretarial		3				
4	Purchasing		9	Gen. Mngr						
5	Marketing		0							
4.	LIMITATION,									
1	Transfer frequency	↑ ↓	v = fcv		P	3	0	6	3	2
2										
3										
5.	INDUCTION,									
1	Throughput time	↑ ↑			0	3	3	0	1	1
2										
3										
4										
5										
6.	NOTES, Reducing the transfer quantity makes it possible fo "close schedule", starting next op. before first op. is finished - thus reducing the throughput time.									

PARAMETER		P 3 0 6										
1.	NAME. TRANSFER FREQUENCY Mfgr											
2.	DEFINITION. The number of transfers of material between two successive work centres per year											
3.	FUNCTION.											
	1	Product Design		6	Finance							
	2	Production Planning		7	Personnel							
	3	Production Control	v	8	Secretarial		3					
	4	Purchasing		9	Gen. Mngr							
	5	Marketing		0								
4.	LIMITATION.											
	1	Transfer quantity ↑ ↓ $v = fcv$				P	3	0	5	3	2	
	2											
	3											
5.	INDUCTION.											
	1	Cost (Prod) - Indirect handling ↑ ↑				0	6	8	2	0	1	0
	2											
	3											
	4											
	5											
6.	NOTES. If the Requirement quantity is fixed, the transfer frequency is a direct function of the transfer quantity.											

PARAMETER		P	3	0	7			
1.	NAME. SET-UP QTY Mfgr (S.Q)							
2.	DEFINITION. The number of parts (not necessarily all the same) completed at a work centre, before changing the tooling set-up.							
3.	FUNCTION.							
1	Product Design	6	Finance					
2	Production Planning	7	Personnel					
3	Production Control ✓	8	Secretarial	3				
4	Purchasing	9	Gen. Mngr					
5	Marketing	0						
4.	LIMITATION.							
1	Set-up frequency Mfgr. ↑ + C = fcv	P	3	0	8	3	2	
2								
3								
5.	INDUCTION.							
1	Set-up time/Op. ↑ +	0	3	3	0	2	2	0
2								
3								
4								
5								
6.	NOTES. The set-up quantity (=ZRQ) for all parts machined one after the other with the same set-up.							

PARAMETER		P 3 0 8										
1.	NAME, SET-UP FREQUENCY Mfgr											
2.	DEFINITION, The number of set-ups on a particular work centre per year											
3.	FUNCTION,											
1	Product Design		6	Finance		↑ 3						
2	Production Planning		7	Personnel								
3	Production Control	✓	8	Secretarial								
4	Purchasing		9	Gen.Mngr								
5	Marketing		0									
4.	LIMITATION,											
1	Set-up quantity	↑ ↓	V = fcv			P	3	0	7	3	2	
2												
3												
5.	INDUCTION,											
1	Capacity - work centre	↑ ↓				0	3	2	0	8	2	0
2	Cost (Prod.) - Indirect (Setting)	↑ ↑				0	6	8	2	3	1	0
3												
4												
5												
6.	NOTES, If the requirement quantity is fixed, the set-up frequency is a direct function of the set-up quantity											

PARAMETER		P 3 0 9									
1.	NAME, ORDERING PERIOD (Single cycle ordering)										
2.	DEFINITION, The period of time covered by a single cycle when using a single cycle ordering system.										
3.	FUNCTION,										
1	Product Design		6	Finance							
2	Production Planning		7	Personnel							
3	Production Control	✓	8	Secretarial		3					
4	Purchasing		9	Gen.Mngr							
5	Marketing		0								
4.	LIMITATION,										
1	Multi or single cycle V				S	3	0	2	8	0	
2											
3											
5.	INDUCTION,										
1	Stocks - Total ↑ ↑				0	3	4	0	5	1	0
2	Set-up time/wc/period ↑ ↓				0	3	3	0	3	2	0
3	Throughput time ↑ ↑				0	3	3	0	1	1	0
4											
5											
6.	NOTES,										

PARAMETER		P	3	1	0
1.	NAME, PROGRAMME TERM - Short fixed programme				
2.	DEFINITION, The period of time covered by the short term fixed programme, with a single cycle system				
3.	FUNCTION,				
1	Product Design	6	Finance		
2	Production Planning	7	Personnel		
3	Production Control ✓	8	Secretarial	3	
4	Purchasing	9	Gen. Mngr		
5	Marketing	0			
4.	LIMITATION,				
1	Ordering period - single cycle ↑ C = fcv	P	3	0	9
2	Multi, <u>or</u> single cycle V →				
3					
5.	INDUCTION,				
1	Flexibility ↑ ↓	0	9	9	0
2	Sensitivity ↑ ↓	0	9	9	0
3	Stocks - Fin. Prods. ↑ ↑	0	3	4	0
4					
5					
6.	NOTES, The programme term is the same as the ordering period				

PARAMETER		P	3	1	1	
1.	NAME. BUFFER STOCK - FINISHED PRODUCTS					
2.	DEFINITION. Stocks of finished products, held to smooth variations in Market demand					
3.	FUNCTION.					
1	Product Design		6	Finance		
2	Production Planning		7	Personnel		
3	Production Control	✓	8	Secretarial		
4	Purchasing		9	Gen. Mngr		
5	Marketing		0			
4.	LIMITATION.					
1						
2						
3						
5.	INDUCTION.					
1	Stocks - finished products	↑ ↑	0	3	4	0
2						
3						
4						
5						
6.	NOTES.					

PARAMETER		P 3 1 3								
1.	NAME, BUFFER STOCK - COMPONENTS BOUGHT									
2.	DEFINITION, Stocks held to insure against scrap, late delivery, or unexpectedly high demand									
3.	FUNCTION,									
	1	Product Design		6	Finance					
	2	Production Planning		7	Personnel					
	3	Production Control	✓	8	Secretarial		3			
	4	Purchasing		9	Gen. Mngr					
	5	Marketing		0						
4.	LIMITATION,									
	1									
	2									
	3									
5.	INDUCTION,									
	1	Stocks - components		↑	↑	0	3	4	0	3 1 0
	2									
	3									
	4									
	5									
6.	NOTES.									

REGULATORY PARAMETER		P 3 1 4												
1.	NAME, BUFFER STOCK - MATERIALS													
2.	DEFINITION, Stocks held to insure against scrap, late delivery, or unexpectedly high demand.													
3.	FUNCTION,													
	1	Product Design		6	Finance		↑ 3							
	2	Production Planning		7	Personnel									
	3	Production Control	✓	8	Secretarial									
	4	Purchasing		9	Gen. Mngr									
	5	Marketing		0										
4.	LIMITATION,													
	1													
	2													
	3													
5.	INDUCTION,													
	1	Stocks - Materials				↑	↑	0	3	4	0	2	1	0
	2													
	3													
	4													
	5													
6.	NOTES,													

REGULATORY PARAMETER		P 3 1 5									
1.	NAME. NO. PARTS SUB-CONTRACTED										
2.	DEFINITION. The number of different parts which could be made in the factory, which are sub-contracted to outside suppliers.										
3.	FUNCTION.										
1	Product Design		6	Finance							
2	Production Planning		7	Personnel							
3	Production Control	✓	8	Secretarial		3					
4	Purchasing		9	Gen. Mngr							
5	Marketing		0								
4.	LIMITATION.										
1											
2											
3											
5.	INDUCTION.										
1	Load - work centre	↑ ↓	0	3	2	0	4	2	0		
2	Value added	↑ ↓	0	6	8	0	4	2	0		
3											
4											
5											
6.	NOTES. The term "bought" is reserved for parts which cannot be made in the factory. Sub-contracting is used mainly to reduce over-load and to smooth production in the face of Market demand variations.										

REGULATORY PARAMETER		P	3	1	6			
1.	NAME, OVERTIME							
2.	DEFINITION, The number of additional hours worked, over normal working hours, in a particular period of time.							
3.	FUNCTION,							
1	Product Design		6	Finance				
2	Production Planning		7	Personnel				
3	Production Control ✓		8	Secretarial		3		
4	Purchasing		9	Gen. Mngr				
5	Marketing		0					
4.	LIMITATION,							
1								
2								
3								
5.	INDUCTION,							
1	Capacity - work centre ↑ ↑	0	3	2	0	8	1	0
2	Cost (Prod) - Total ↑ ↑	0	6	8	2	5	1	0
3	Throughput time ↑ ↓	0	3	3	0	1	2	0
4								
5								
6.	NOTES,							

REGULATORY PARAMETER					<div>P4</div>		
TYPE, PURCHASING							
CODE,				DESCRIPTION,			
P	4	0	1	Purchasing Order Qty			
		0	2	Purchasing Order frequency			
		0	3	Purchasing delivery batch quantity			
		0	4	Purchasing delivery batch frequency			
		0	5	Number sources per component			
		0	6	Number components per source			

PARAMETER		P	4	0	1
1.	NAME. PURCHASING - ORDER QTY				
2.	DEFINITION. The number of parts ordered from a supplier by the issue of a purchase order				
3.	FUNCTION.				
	1	Product Design	6	Finance	
	2	Production Planning	7	Personnel	
	3	Production Control	8	Secretarial	
	4	Purchasing	9	Gen. Mngr	
	5	Marketing	0		
4.	LIMITATION.				
	1	Purchase order frequency	↑ ↓	V = fcv	P 4 0 2 3 2
	2				
	3				
5.	INDUCTION.				
	1	Purchase price	↑ ↓		0 4 6 0 1 2 0
	2				
	3				
	4				
	5				
6.	NOTES.				

PARAMETER		P	4	0	2																																																								
1.	NAME, PURCHASING-ORDER FREQUENCY																																																												
2.	DEFINITION. The number of purchase orders issued per year																																																												
3.	FUNCTION.		<table border="1"> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>1</td><td>Product Design</td><td>6</td><td>Finance</td><td></td><td></td><td></td> </tr> <tr> <td>2</td><td>Production Planning</td><td>7</td><td>Personnel</td><td></td><td></td><td></td> </tr> <tr> <td>3</td><td>Production Control</td><td>8</td><td>Secretarial</td><td></td><td></td><td></td> </tr> <tr> <td>4</td><td>Purchasing</td><td>9</td><td>Gen. Mngr</td><td></td><td></td><td></td> </tr> <tr> <td>5</td><td>Marketing</td><td>0</td><td></td><td></td><td></td><td></td> </tr> </table>											1	Product Design	6	Finance				2	Production Planning	7	Personnel				3	Production Control	8	Secretarial				4	Purchasing	9	Gen. Mngr				5	Marketing	0																	
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6.	NOTES.																																																												

PARAMETER		P	4	0	3																																															
1.	NAME, PURCHASING - DELIVERY BATCH QTY																																																			
2.	DEFINITION, The number of parts delivered as a single batch by a supplier against a purchase order.																																																			
3.	FUNCTION,		<table border="1"> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>1</td> <td>Product Design</td> <td>6</td> <td>Finance</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>Production Planning</td> <td>7</td> <td>Personnel</td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>Production Control</td> <td>8</td> <td>Secretarial</td> <td>4</td> <td></td> </tr> <tr> <td>4</td> <td>Purchasing</td> <td>9</td> <td>Gen.Mngr</td> <td></td> <td></td> </tr> <tr> <td>5</td> <td>Marketing</td> <td>0</td> <td></td> <td></td> <td></td> </tr> </table>									1	Product Design	6	Finance			2	Production Planning	7	Personnel			3	Production Control	8	Secretarial	4		4	Purchasing	9	Gen.Mngr			5	Marketing	0														
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PARAMETER		P	4	0	4																																																								
1.	NAME, PURCHASING - DELIVERY BATCH FREQUENCY																																																												
2.	DEFINITION, The number of different batches of materials delivered by a supplier in a given period of time																																																												
3.	FUNCTION,		<table border="1"> <tr> <td>1</td> <td>Product Design</td> <td>6</td> <td>Finance</td> <td rowspan="5">↑ 4</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>Production Planning</td> <td>7</td> <td>Personnel</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>Production Control</td> <td>8</td> <td>Secretarial</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>Purchasing</td> <td>9</td> <td>Gen. Mngr</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td>Marketing</td> <td>0</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>				1	Product Design	6	Finance	↑ 4						2	Production Planning	7	Personnel						3	Production Control	8	Secretarial						4	Purchasing	9	Gen. Mngr						5	Marketing	0															
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2																																																													
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5																																																													
6.	NOTES,																																																												

PARAMETER		P	4	0	6
1.	NAME, NO. DIFFERENT COMPONENTS/SOURCE				
2.	DEFINITION, The number of different components purchased from the same supplier				
3.	FUNCTION.				
1	Product Design	6	Finance		
2	Production Planning	7	Personnel		
3	Production Control	8	Secretarial		
4	Purchasing ✓	9	Gen.Mngr		
5	Marketing	0			
4.	LIMITATION.				
1					
2					
3					
5.	INDUCTION.				
1	Cost (Mngt) - Purchasing ↑ ↓	0	6	8	0
2					
3					
4					
5					
6.	NOTES, Delivery from supplier to customer is less costly, if same transport brings several items.				

PARAMETER		P 5 0 1							
1.	NAME, SELLING PRICE								
2.	DEFINITION, The price charged per unit of product for the sale of a particular product								
3.	FUNCTION,								
1	Product Design	6	Finance						
2	Production Planning	7	Personnel						
3	Production Control	8	Secretarial						
4	Purchasing	9	Gen. Mngr						
5	Marketing	0							
4.	LIMITATION,								
1									
2									
3									
5.	INDUCTION,								
1	Revenue	↑ ↑	0	6	8	0	1	1	0
2	Sales	↑ ↓	0	5	5	0	3	2	0
3									
4									
5									
6.	NOTES,								

PARAMETER		P 5 0 2									
1.	NAME. SERVICE LEVEL										
2.	DEFINITION. The percentage of orders received, which are met by immediate deliveries from stock										
3.	FUNCTION.										
1	Product Design	6	Finance								
2	Production Planning	7	Personnel								
3	Production Control	8	Secretarial	5							
4	Purchasing	9	Gen. Mngr								
5	Marketing	0									
4.	LIMITATION.										
1											
2											
3											
5.	INDUCTION.										
1	Sales - Total	↑ ↑	0	5	5	0	3	1	0		
2	Stocks - Finished Products	↑ ↑	0	3	4	0	1	1	0		
3											
4											
5											
6.	NOTES.										

PARAMETER		P	5	0	3			
1.	NAME, PACKAGING QTY							
2.	DEFINITION, The quantity of a product which is batched together in a package as a unit of sale							
3.	FUNCTION,							
1	Product Design	6	Finance					
2	Production Planning	7	Personnel					
3	Production Control	8	Secretarial	5				
4	Purchasing	9	Gen. Mngr					
5	Marketing	0						
4.	LIMITATION,							
1								
2								
3								
5.	INDUCTION,							
1	Cost - Indirect Total	0	6	8	2	4	2	0
2								
3								
4								
5								
6.	NOTES, Few large packages tend to cost less than many small packages.							

PARAMETER		P	5	0	4	
1.	NAME, NO. SALES OUTLETS					
2.	DEFINITION. The number of different sales outlets, used by the company for the distribution of its products.					
3.	FUNCTION.					
1	Product Design	6	Finance			
2	Production Planning	7	Personnel			
3	Production Control	8	Secretarial			
4	Purchasing	9	Gen. Mngr			
5	Marketing	0				
4.	LIMITATION.					
1						
2						
3						
5.	INDUCTION.					
1	Sales - total	0	5	5	0	3
2						
3						
4						
5						
6.	NOTES.					

PARAMETER		P	5	0	6
1.	NAME. NO. SALESMAN VISITS/ OUTLET p.a.				
2.	DEFINITION. The number of visits by salesmen to a sales outlet per year				
3.	FUNCTION.				
1	Product Design	6	Finance		
2	Production Planning	7	Personnel		
3	Production Control	8	Secretarial	5	
4	Purchasing	9	Gen. Mngr		
5	Marketing	0			
4.	LIMITATION.				
1					
2					
3					
5.	INDUCTION.				
1	Cost (Mngt) - Marketing ↑ ↑	0	6	8	1
2					
3					
4					
5					
6.	NOTES. Increasing the number of visits - within certain limits - should also increase sales, but this is not always the case.				

PARAMETER		P 5 0 7									
1.	NAME,	SALES DISCOUNT									
2.	DEFINITION,										
3.	FUNCTION,										
	1 Product Design		6 Finance								
	2 Production Planning		7 Personnel								
	3 Production Control		8 Secretarial								
	4 Purchasing		9 Gen. Mngr								
	5 Marketing	✓	0								
4.	LIMITATION,										
	1										
	2										
	3										
5.	INDUCTION,										
	1 Sales - Total	↑ ↑	0	5	5	0	3	1	0		
	2 Revenue	↑ ↓	0	6	8	0	1	2	0		
	3										
	4										
	5										
6.	NOTES,										

REGULATORY PARAMETER					P	6	
TYPE, FINANCE							
CODE,					DESCRIPTION,		
P	6	0	1		Credit given on sales		
		0	2		Credit taken on Purchases		
		0	3		Write-off qty		
		0	4		Sanction qty		
		0	5		Pay-back period		

PARAMETER				P	6	0	1
1.	NAME, CREDIT ON SALES						
2.	DEFINITION. Time allowed to customers to pay against sales invoices.						
3.	FUNCTION.						
	1	Product Design	6	Finance	↑		
	2	Production Planning	7	Personnel			
	3	Production Control	8	Secretarial	6		
	4	Purchasing	9	Gen. Mngr			
	5	Marketing	0				
4.	LIMITATION.						
	1						
	2						
	3						
5.	INDUCTION.						
	1	Capital - credit	↑ ↓		0	6	6
	2				0	3	2
	3				0		
	4						
	5						
6.	NOTES. Giving credit to customers is equivalent to lending them money to pay						

REGULATORY PARAMETER

P 6 0 2

1. NAME.
CREDIT TAKEN ON PURCHASES

2. DEFINITION,
Time taken between receipt of purchases and payment to supplier

3. FUNCTION,

1	Product Design	6	Finance	✓
2	Production Planning	7	Personnel	
3	Production Control	8	Secretarial	
4	Purchasing	9	Gen. Mngr	
5	Marketing	0		



6

4. LIMITATION,

1

2

3

5. INDUCTION,

1

Capital - credit

↑ ↑

2

3

4

5

0 6 6 0 3 1 0

6. NOTES,

PARAMETER		P	6	0	3					
1.	NAME, WRITE-OFF QUANTITY									
2.	DEFINITION. The quantity of a new product, in which the cost of any special tooling is to be recovered in the standard cost.									
3.	FUNCTION.									
1	Product Design	6	Finance	✓						
2	Production Planning	7	Personnel							
3	Production Control	8	Secretarial							
4	Purchasing	9	Gen.Mngr							
5	Marketing	0								
4.	LIMITATION.									
1	Selling price	↑ ↑	Min	P	5	0	1	4	2	
2										
3										
5.	INDUCTION.									
1	Obsolescence - stock & W.I.P	↑ ↑		0	6	6	1	3	1	0
2										
3										
4										
5										
6.	NOTES.									

PARAMETER		P	6	0	4				
1.	NAME, SANCTION QTY								
2.	DEFINITION, The number of products to be produced after a given date, for which the Buyer is authorised to place material supply contracts.								
3.	FUNCTION,								
1	Product Design	6	Finance	✓					
2	Production Planning	7	Personnel						
3	Production Control	8	Secretarial		6				
4	Purchasing	9	Gen. Mngr						
5	Marketing	0							
4.	LIMITATION,								
1									
2									
3									
5.	INDUCTION,								
1	Purchase price	↑ ↓	0	4	6	0	1	2	0
2	Obsolescence	↑ ↓	0	6	6	1	3	1	0
3									
4									
5									
6.	NOTES,								

PARAMETER		P 6 0 5																																																
1.	NAME, PAY - BACK PERIOD																																																	
2.	DEFINITION, The time during which the cost of a new asset is to be recovered from savings due to it's use.																																																	
3.	FUNCTION.																																																	
1	Product Design	6	Finance	✓	 <table border="1"> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>																						6																							
6																																																		
2	Production Planning	7	Personnel																																															
3	Production Control	8	Secretarial																																															
4	Purchasing	9	Gen. Mngr																																															
5	Marketing	0																																																
4.	LIMITATION.																																																	
1																																																		
2																																																		
3																																																		
5.	INDUCTION.																																																	
1	Investment - Total	! <td colspan="2"></td> <td>0</td> <td>6</td> <td>6</td> <td>1</td> <td>0</td> <td>1</td> <td>0</td>			0	6	6	1	0	1	0																																							
2																																																		
3																																																		
4																																																		
5																																																		
6.	NOTES.																																																	

PARAMETER		P	7	0	1				
1.	NAME, HIRE								
2.	DEFINITION, Taking new employees into service								
3.	FUNCTION.								
1	Product Design	6	Finance						
2	Production Planning	7	Personnel	✓					
3	Production Control	8	Secretarial	7					
4	Purchasing	9	Gen.Mngr						
5	Marketing	0							
4.	LIMITATION.								
1									
2									
3									
5.	INDUCTION.								
1	Cost (Prod) - Total	↑ ↑	0	6	8	2	5	1	0
2									
3									
4									
5									
6.	NOTES.								

PARAMETER		P	7	0	2				
1.	NAME, FIRE								
2.	DEFINITION, Expelling people from employment								
3.	FUNCTION,								
1	Product Design	6	Finance						
2	Production Planning	7	Personnel	✓					
3	Production Control	8	Secretarial						
4	Purchasing	9	Gen. Mngr						
5	Marketing	0							
4.	LIMITATION,								
1									
2									
3									
5.	INDUCTION,								
1	Cost (Prod) - Total	↑ ↓	0	6	8	2	5	2	0
2									
3									
4									
5									
6.	NOTES,								

REGULATORY PARAMETER		P 7 0 3										
1.	NAME, TRAINING HOURS/employee											
2.	DEFINITION, Number of hours training per employee per year											
3.	FUNCTION,											
1	Product Design		6	Finance		↑ 7						
2	Production Planning		7	Personnel	✓							
3	Production Control		8	Secretarial								
4	Purchasing		9	Gen. Mngr								
5	Marketing		0									
4.	LIMITATION,											
1												
2												
3												
5.	INDUCTION,											
1	Idle time - waiting help				↑ ↓	0	3	3	1	0	2	0
2												
3												
4												
5												
6.	NOTES,											

CHAPTER 5. INPUT VARIABLES

1. INTRODUCTION

This chapter contains the classification sheets for a number of Input variables. These are variables which affect the output of the production system, over which the Manager has no control.

Each input variable has been assigned to the Management function with which it is most closely associated, and lists are included of the variables assigned to each function covering -

- I1. Input variables. Product design
- I2. Input variables. Production planning
- I3. Input variables. Production control
- I4. Input variables. Purchasing
- I5. Input variables. Marketing
- I6. Input variables. Finance
- I7. Input variables. Personnel
- I9. Input variables. General

Very few of these variables have been given and there is a need for expansion of the lists. No list has been submitted yet in the case of I8. Secretarial.

A classification sheet has been included for each variable showing:

1. The name of the variable
2. It's code number
3. It's description or definition
4. The name of the function
5. Changes induced by (V) in other variables (CV)

It is assumed that the values of any other free variables are fixed when studying any particular pair of variables. The classification sheets only show "transitive" and "first order" connectance.

INPUT VARIABLE						<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">1</td> <td style="width: 20px; text-align: center;">1</td> <td style="width: 20px; text-align: center;">0</td> <td style="width: 20px; text-align: center;">1</td> </tr> </table>				1	1	0	1																																																									
1	1	0	1																																																																			
1	NAME Insurance Requirements																																																																					
2	DEFINITION Requirements affecting product specification and testing, imposed by Insurance companies.																																																																					
3	FUNCTION <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 35%;">Product Design</td> <td style="width: 5%; text-align: center;">✓</td> <td style="width: 5%; text-align: center;">6</td> <td style="width: 35%;">Finance</td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> </tr> <tr> <td style="text-align: center;">2</td> <td>Production Planning</td> <td></td> <td style="text-align: center;">7</td> <td>Personnel</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">3</td> <td>" Control</td> <td></td> <td style="text-align: center;">8</td> <td>Secretarial</td> <td></td> <td style="text-align: center;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">1</div> </td> </tr> <tr> <td style="text-align: center;">4</td> <td>Purchasing</td> <td></td> <td style="text-align: center;">9</td> <td>Gen: Management</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">5</td> <td>Marketing</td> <td></td> <td style="text-align: center;">0</td> <td></td> <td></td> <td></td> </tr> </table>										1	Product Design	✓	6	Finance			2	Production Planning		7	Personnel			3	" Control		8	Secretarial		<div style="border: 1px solid black; padding: 2px; display: inline-block;">1</div>	4	Purchasing		9	Gen: Management			5	Marketing		0																												
1	Product Design	✓	6	Finance																																																																		
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5	Marketing		0																																																																			
4	CONNECTANCE <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 60%;">Cost(Prod) - Total</td> <td style="width: 10%; text-align: center;">↑ ↑</td> <td style="width: 5%; text-align: center;">0</td> <td style="width: 5%; text-align: center;">6</td> <td style="width: 5%; text-align: center;">8</td> <td style="width: 5%; text-align: center;">2</td> <td style="width: 5%; text-align: center;">5</td> <td style="width: 5%; text-align: center;">1</td> <td style="width: 5%; text-align: center;">0</td> </tr> <tr><td style="text-align: center;">2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>										1	Cost(Prod) - Total	↑ ↑	0	6	8	2	5	1	0	2										3										4										5										6									
1	Cost(Prod) - Total	↑ ↑	0	6	8	2	5	1	0																																																													
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3																																																																						
4																																																																						
5																																																																						
6																																																																						
5	NOTES Particularly applies to products such as ships, aircraft, boilers etc.																																																																					

INPUT VARIABLE									
<div style="float: right; border: 1px solid black; padding: 2px;"> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; text-align: center; line-height: 20px;">1</div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; text-align: center; line-height: 20px;">1</div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; text-align: center; line-height: 20px;">0</div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; text-align: center; line-height: 20px;">2</div> </div>									
1	NAME Safety Laws								
2	DEFINITION Requirements affecting product specification and testing imposed by law								
3	FUNCTION								
	1	Product Design	✓	6	Finance				
	2	Production Planning		7	Personnel				
	3	" Control		8	Secretarial			1	
	4	Purchasing		9	Gen: Management				
	5	Marketing		0					
4	CONNECTANCE								
	1	Cost (Prod) - Total		↑ ↑		0	6	8	2
	2					5	1	0	
	3								
	4								
	5								
	6								
5	NOTES eg. No lead paint on children's toys								

INPUT VARIABLES					I	2	
TYPE, PRODUCTION PLANNING							
CODE,					DESCRIPTION,		
I	2	0	1	Safety Laws			
		0	2				

INPUT VARIABLE		I 2 0 1							
1	NAME Safety Law								
2	DEFINITION Requirements affecting methods of Production imposed by law								
3	FUNCTION								
	1 Product Design		6 Finance						
	2 Production Planning	✓	7 Personnel		↑				
	3 " Control		8 Secretarial		2-				
	4 Purchasing		9 Gen: Management						
	5 Marketing		0						
4	CONNECTANCE								
	1 Cost (Prod) - Total	↑ ↑	0	6	8	2	7	1	0
	2								
	3								
	4								
	5								
	6								
5	NOTES e.g. Guarding of m/c tools.								

INPUT VARIABLE				<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">I</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">3</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">1</div>			
1	NAME Working Hours						
2	DEFINITION A statutory limit imposed on the number of hours which an employee may work during a specified period of time.						
3	FUNCTION						
	1	Product Design	6	Finance			
	2	Production Planning	7	Personnel			
	3	" Control	8	Secretarial		3	
	4	Purchasing	9	Gen: Management			
	5	Marketing	0				
4	CONNECTANCE						
	1	Cost (Prod) - Total	↑ ↓		0	6	8
	2				2	7	2
	3						
	4						
	5						
	6						
5	NOTES						

INPUT VARIABLES					I	4	
TYPE,					PURCHASING		
CODE,					DESCRIPTION.		
I	4	0	1		Number possible Mtl.suppliers		
		0	2				

INPUT VARIABLE				I	4	0	1																																																												
1	NAME Number of possible material suppliers																																																																		
2	DEFINITION The size of the supply market for an item in terms of the number of possible suppliers.																																																																		
3	FUNCTION <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 35%;">Product Design</td> <td style="width: 5%;"></td> <td style="width: 5%; text-align: center;">6</td> <td style="width: 35%;">Finance</td> <td style="width: 5%;"></td> <td></td> </tr> <tr> <td style="text-align: center;">2</td> <td>Production Planning</td> <td></td> <td style="text-align: center;">7</td> <td>Personnel</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">3</td> <td>" Control</td> <td></td> <td style="text-align: center;">8</td> <td>Secretarial</td> <td></td> <td style="text-align: center;">4.</td> </tr> <tr> <td style="text-align: center;">4</td> <td>Purchasing</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">9</td> <td>Gen: Management</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">5</td> <td>Marketing</td> <td></td> <td style="text-align: center;">0</td> <td></td> <td></td> <td></td> </tr> </table>							1	Product Design		6	Finance			2	Production Planning		7	Personnel			3	" Control		8	Secretarial		4.	4	Purchasing	✓	9	Gen: Management			5	Marketing		0																												
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1	Cost (Prod) - Total	↑ ↓	0	6	8	2	5	2	0																																																										
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INPUT VARIABLE				<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">I</td> <td style="width: 20px; text-align: center;">5</td> <td style="width: 20px; text-align: center;">0</td> <td style="width: 20px; text-align: center;">1</td> </tr> </table>				I	5	0	1																																																								
I	5	0	1																																																																
1	NAME <div style="margin-left: 100px;">Number of Competitors</div>																																																																		
2	DEFINITION <div style="margin-left: 20px;">The size of the market for a product, in terms of the number of competitors who can supply a similar product.</div>																																																																		
3	FUNCTION <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 35%;">Product Design</td> <td style="width: 5%; text-align: center;">6</td> <td style="width: 35%;">Finance</td> <td style="width: 20%;"></td> </tr> <tr> <td style="text-align: center;">2</td> <td>Production Planning</td> <td style="text-align: center;">7</td> <td>Personnel</td> <td></td> </tr> <tr> <td style="text-align: center;">3</td> <td>" Control</td> <td style="text-align: center;">8</td> <td>Secretarial</td> <td style="text-align: center;">5</td> </tr> <tr> <td style="text-align: center;">4</td> <td>Purchasing</td> <td style="text-align: center;">9</td> <td>Gen: Management</td> <td></td> </tr> <tr> <td style="text-align: center;">5</td> <td>Marketing</td> <td style="text-align: center;">0</td> <td></td> <td></td> </tr> </table>							1	Product Design	6	Finance		2	Production Planning	7	Personnel		3	" Control	8	Secretarial	5	4	Purchasing	9	Gen: Management		5	Marketing	0																																					
1	Product Design	6	Finance																																																																
2	Production Planning	7	Personnel																																																																
3	" Control	8	Secretarial	5																																																															
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5	Marketing	0																																																																	
4	CONNECTANCE <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 60%;">Selling price</td> <td style="width: 10%; text-align: center;">↑ ↓</td> <td style="width: 5%; text-align: center;">P</td> <td style="width: 5%; text-align: center;">5</td> <td style="width: 5%; text-align: center;">0</td> <td style="width: 5%; text-align: center;">1</td> <td style="width: 5%; text-align: center;">2</td> <td style="width: 5%; text-align: center;">0</td> <td style="width: 5%;"></td> </tr> <tr><td style="text-align: center;">2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>							1	Selling price	↑ ↓	P	5	0	1	2	0		2										3										4										5										6									
1	Selling price	↑ ↓	P	5	0	1	2	0																																																											
2																																																																			
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5	NOTES																																																																		

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I	6	0	1																																																								
1	NAME Value of the Pound (£)																																																										
2	DEFINITION The value of the pound (£) in terms of it's exchange value in some other specified currency.																																																										
3	FUNCTION																																																										
	1	Product Design	6	Finance	✓	<div style="display: flex; align-items: center; justify-content: center;"> <div style="margin-right: 10px;">↑</div> <div style="border: 1px solid black; padding: 2px 5px;">6</div> </div>																																																					
	2	Production Planning	7	Personnel																																																							
	3	" Control	8	Secretarial																																																							
	4	Purchasing	9	Gen: Management																																																							
	5	Marketing	0																																																								
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	6																																																										
5	NOTES Unless otherwise specified the currency used for comparison is the US \$																																																										

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1	NAME Interest on Bank Loans																																																												
2	DEFINITION The rate of interest charged by banks for bank overdrafts.																																																												
3	FUNCTION <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 40%;">Product Design</td> <td style="width: 5%; text-align: center;">6</td> <td style="width: 40%;">Finance</td> <td style="width: 10%; text-align: center;">✓</td> <td></td> </tr> <tr> <td style="text-align: center;">2</td> <td>Production Planning</td> <td style="text-align: center;">7</td> <td>Personnel</td> <td></td> <td style="text-align: center;">↑</td> </tr> <tr> <td style="text-align: center;">3</td> <td>" Control</td> <td style="text-align: center;">8</td> <td>Secretarial</td> <td></td> <td style="text-align: center;"> <div style="border: 1px solid black; padding: 2px 5px;">6</div> </td> </tr> <tr> <td style="text-align: center;">4</td> <td>Purchasing</td> <td style="text-align: center;">9</td> <td>Gen: Management</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">5</td> <td>Marketing</td> <td style="text-align: center;">0</td> <td></td> <td></td> <td></td> </tr> </table>	1	Product Design	6	Finance	✓		2	Production Planning	7	Personnel		↑	3	" Control	8	Secretarial		<div style="border: 1px solid black; padding: 2px 5px;">6</div>	4	Purchasing	9	Gen: Management			5	Marketing	0																																	
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4	CONNECTANCE <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 40%;">Investment - Total</td> <td style="width: 10%; text-align: center;">↑ ↓</td> <td style="width: 10%; text-align: center;">0</td> <td style="width: 10%; text-align: center;">6</td> <td style="width: 10%; text-align: center;">6</td> <td style="width: 10%; text-align: center;">1</td> <td style="width: 10%; text-align: center;">0</td> <td style="width: 10%; text-align: center;">2</td> <td style="width: 10%; text-align: center;">0</td> </tr> <tr><td style="text-align: center;">2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>	1	Investment - Total	↑ ↓	0	6	6	1	0	2	0	2										3										4										5										6									
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5	NOTES If overdrawn, a rise in interest rates increases cost and reduced profit																																																												

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1	NAME <div style="margin-left: 100px;">Minimum Wage</div>																																																																					
2	DEFINITION The minimum wage which may be paid to an employee																																																																					
3	FUNCTION <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 35%;">Product Design</td> <td style="width: 5%; text-align: center;">6</td> <td style="width: 35%;">Finance</td> <td style="width: 5%;"></td> <td style="width: 15%;"></td> </tr> <tr> <td style="text-align: center;">2</td> <td>Production Planning</td> <td style="text-align: center;">7</td> <td>Personnel</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">↑</td> </tr> <tr> <td style="text-align: center;">3</td> <td>" Control</td> <td style="text-align: center;">8</td> <td>Secretarial</td> <td></td> <td style="text-align: center;">7</td> </tr> <tr> <td style="text-align: center;">4</td> <td>Purchasing</td> <td style="text-align: center;">9</td> <td>Gen: Management</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">5</td> <td>Marketing</td> <td style="text-align: center;">0</td> <td></td> <td></td> <td></td> </tr> </table>										1	Product Design	6	Finance			2	Production Planning	7	Personnel	✓	↑	3	" Control	8	Secretarial		7	4	Purchasing	9	Gen: Management			5	Marketing	0																																	
1	Product Design	6	Finance																																																																			
2	Production Planning	7	Personnel	✓	↑																																																																	
3	" Control	8	Secretarial		7																																																																	
4	Purchasing	9	Gen: Management																																																																			
5	Marketing	0																																																																				
4	CONNECTANCE <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 55%;">Cost (Prod) - Total</td> <td style="width: 10%; text-align: center;">↑ ↑</td> <td style="width: 5%; text-align: center;">0</td> <td style="width: 5%; text-align: center;">6</td> <td style="width: 5%; text-align: center;">8</td> <td style="width: 5%; text-align: center;">2</td> <td style="width: 5%; text-align: center;">5</td> <td style="width: 5%; text-align: center;">1</td> <td style="width: 5%; text-align: center;">0</td> </tr> <tr><td style="text-align: center;">2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>										1	Cost (Prod) - Total	↑ ↑	0	6	8	2	5	1	0	2										3										4										5										6									
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6																																																																						
5	NOTES <div style="margin-left: 40px;">Based on Law, Trade Union agreement, or custom.</div>																																																																					

INPUT VARIABLE

I	7	0	2
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1 NAME Severance Pay

2 DEFINITION
The sum which must be paid to an employee whose employment is terminated.

3 FUNCTION

1	Product Design	6	Finance	
2	Production Planning	7	Personnel	✓
3	" Control	8	Secretarial	
4	Purchasing	9	Gen: Management	
5	Marketing	0		



7

4 CONNECTANCE

1 Flexibility

↑ ↓

0	9	9	0	1	2	0

5 NOTES

INPUT VARIABLE						<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">1</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">7</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">3</div>																																																					
1	NAME National Insurance																																																										
2	DEFINITION Money paid by employees to the government to insure against unemployment or sickness.																																																										
3	FUNCTION																																																										
	1	Product Design		6	Finance		<div style="display: flex; align-items: center; justify-content: center;"> <div style="border: 1px solid black; padding: 5px; margin: 0 10px;">7</div> <div style="font-size: 2em;">↑</div> </div>																																																				
	2	Production Planning		7	Personnel	✓																																																					
	3	" Control		8	Secretarial																																																						
	4	Purchasing		9	Gen: Management																																																						
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4	CONNECTANCE						<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; text-align: center;">0</td> <td style="width: 10%; text-align: center;">6</td> <td style="width: 10%; text-align: center;">8</td> <td style="width: 10%; text-align: center;">2</td> <td style="width: 10%; text-align: center;">5</td> <td style="width: 10%; text-align: center;">1</td> <td style="width: 10%; text-align: center;">0</td> </tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>				0	6	8	2	5	1	0																																										
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	1	Cost (Prod) - Total	↑ ↑																																																								
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	4																																																										
	5																																																										
	6																																																										
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INPUT VARIABLES					I	9	
TYPE, GENERAL							
CODE,					DESCRIPTION,		
I	9	0	1		The weather		
		0	2				

INPUT VARIABLE						<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">1</td> <td style="width: 20px; text-align: center;">9</td> <td style="width: 20px; text-align: center;">0</td> <td style="width: 20px; text-align: center;">1</td> </tr> </table>				1	9	0	1
1	9	0	1										
1	NAME The Weather												
2	DEFINITION The number of hours of sunshine, the number of days without rain, or wind.												
3	FUNCTION												
1	Product Design		6	Finance									
2	Production Planning		7	Personnel									
3	" Control		8	Secretarial		9							
4	Purchasing		9	Gen: Management	✓								
5	Marketing		0										
4	CONNECTANCE												
1	Investment - Land & Buildings				↑ ↓	0	6	6	0	6	2	0	
2	Cost - heating & Lighting				↑ ↓	0	6	8	1	1	2	0	
3													
4													
5													
6													
5	NOTES												
<p>An "Increase" in the weather, means here an "Improvement".</p> <p>e.g. In Egypt the weather is so good that many production operations can be done outside.</p>													

CHAPTER 6. OUTPUT VARIABLES

1. INTRODUCTION

This chapter contains the classification sheets for a number of output variables. The value of these variables can only be changed indirectly by varying the values of appropriate parameters, but these changes may in turn affect the values of other variables.

Each output variable has been classified, first, according to the Management function with which it is most closely associated and second, according to the type of unit used to measure it. This has produced the following lists of "output variables":-

- O.11 Product design - Dimensions (State)
- O.13 Product design - Time (Rate)
- O.21 Production planning - Dimensions (State)
- O.23 Production planning - Time (Rate)
- O.32 Production control - Load & capacity ()
- O.33 Production control - Time (Rate)
- O.34 Production control - Quantity (State)
- O.35 Production control - Quantity (Rate)
- O.43 Purchasing - Time (Rate)
- O.44 Purchasing - Quantity (State)
- O.48 Purchasing - Money (Rate)
- O.53 Marketing - Time (Rate)
- O.54 Marketing - Quantity (State)
- O.55 Marketing - Quantity (Rate)
- O.66 Finance - Money (State)
- O.68 Finance - Money (Rate)
- O.73 Personnel - Time (Rate)
- O.74 Personnel - Quantity (State)
- O.75 Personnel - Quantity (Rate)
- O.77 Personnel - People (State)
- O.78 Personnel - Money (Rate)
- O.99 Gen.Management - System Performance (State)

Note: In (O.32) Load is a state. Capacity is a rate.

In some of these lists only one or two examples have been given and there is a need to expand the lists. In the case of (08), no list has yet been submitted and in most of the other main function classes there are sub-class lists missing which may need to be added later.

A classification sheet has been included for each Output variable. These sheets show -

1. The name of the output variable and It's code number
2. It's description, or definition
3. The unit of measurement
4. The name of the management function to which it is assigned and the class of unit used to measure it.
5. Any "LIMITATIONS" imposed by (V) on any other variables (CV)
6. Any change in the value of other variables (CV) "INDUCED" by changes in (V)
7. The name of the plan or aim used for feedback control.

The connectance found at (5) and (6) is coded, as shown in Chapter 1, Fig.3.

It should be noted that the classification sheets only show Transitive connectance. (The effect of V on CV, NOT of CV on V). Also, they only show first order connectance and when studying any pair of variables, it is assumed that the values of all other free variables are fixed.

OUTPUT VARIABLES

0

1

1

TYPE,

PRODUCT DESIGN (1)

DIMENSIONS (L)

CODE,

DESCRIPTION,

0

1

1

0

1

Size - Measured

0

2

OUTPUT VARIABLE				<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">0</td> <td style="width: 20px; text-align: center;">1</td> <td style="width: 20px; text-align: center;">1</td> <td style="width: 20px; text-align: center;">0</td> <td style="width: 20px; text-align: center;">1</td> </tr> </table>					0	1	1	0	1
0	1	1	0	1									
1.	NAME, SIZE - Measured												
2.	DEFINITION, The actual size of a dimension as found by measuring it												
3.	UNITS, Lenth, Angle, Weight												
4.	FUNCTION.												
	1	Product Design	6	Finance									
	2	Production Plan'g	7	Personnel									
	3	" Control	8	Secretarial		1	1	= DIMENSION					
	4	Purchasing	9	Gen. Mngt.									
	5	Marketing											
5.	LIMITATION.												
	1												
	2												
	3												
6.	INDUCTION.												
	1	Reject	↑↑		0	3	5	0	6				
	2	Scrap	↑↓		0	3	5	0	2				
	3												
	4												
	5												
7.	CONTROL PLAN, OR AIM, Dimension - Size and Tolerance - as designed												
8.	NOTES												

OUTPUT VARIABLE									
<div style="float: right; border: 1px solid black; padding: 2px;"> 0 1 3 0 1 </div>									
1.	NAME, DESIGN TIME								
2.	DEFINITION, The time taken from the conception of a new product to the time when it is ready for production								
3.	UNITS, Time : Weeks, days, hours, mins.								
4.	FUNCTION,								
	1	Product Design	6	Finance					
	2	Production Plan'g	7	Personnel					
	3	" Control	8	Secretarial		1	3	=	TIME
	4	Purchasing	9	Gen. Mngt.					
	5	Marketing							
5.	LIMITATION,								
	1								
	2								
	3								
6.	INDUCTION,								
	1	System Flexibility	↑ ↓		0	9	9	0	1
	2	Cost - Product design	↑ ↑		0	6	8	0	6
	3								
	4								
	5								
7.	CONTROL PLAN, OR AIM,								
	Planned design time								
8.	NOTES								

OUTPUT VARIABLE																																																											
<div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">0</div> <div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">2</div> <div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">1</div> <div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">0</div> <div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">1</div>																																																											
1.	NAME, <div style="text-align: center; margin-top: 10px;">Size Measured - Tooling</div>																																																										
2.	DEFINITION, The actual size of a tool dimension as found by measuring it																																																										
3.	UNITS, Length, Angle, Weight.																																																										
4.	FUNCTION, <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 40%;">Product Design</td> <td style="width: 5%; text-align: center;">6</td> <td style="width: 40%;">Finance</td> <td style="width: 10%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> </tr> <tr> <td style="text-align: center;">2</td> <td>Production Plan's ✓</td> <td style="text-align: center;">7</td> <td>Personnel</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">3</td> <td>" Control</td> <td style="text-align: center;">8</td> <td>Secretarial</td> <td></td> <td style="text-align: center;">2</td> <td style="text-align: center;">1</td> <td colspan="3">= Dimension</td> </tr> <tr> <td style="text-align: center;">4</td> <td>Purchasing</td> <td style="text-align: center;">9</td> <td>Gen. Mngt.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">5</td> <td>Marketing</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>									1	Product Design	6	Finance							2	Production Plan's ✓	7	Personnel							3	" Control	8	Secretarial		2	1	= Dimension			4	Purchasing	9	Gen. Mngt.							5	Marketing								
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5.	LIMITATION, <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr><td style="width: 5%; text-align: center;">1</td><td style="width: 60%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td></tr> <tr><td style="text-align: center;">2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>									1										2										3																													
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2																																																											
3																																																											
6.	INDUCTION, <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 40%;">Reject</td> <td style="width: 10%; text-align: center;">↑ ↑</td> <td style="width: 5%; text-align: center;">0</td> <td style="width: 5%; text-align: center;">3</td> <td style="width: 5%; text-align: center;">5</td> <td style="width: 5%; text-align: center;">0</td> <td style="width: 5%; text-align: center;">6</td> <td style="width: 5%; text-align: center;">3</td> <td style="width: 5%; text-align: center;">0</td> </tr> <tr> <td style="text-align: center;">2</td> <td>Scrap</td> <td style="text-align: center;">↑ ↓</td> <td style="text-align: center;">0</td> <td style="text-align: center;">3</td> <td style="text-align: center;">5</td> <td style="text-align: center;">0</td> <td style="text-align: center;">2</td> <td style="text-align: center;">6</td> <td style="text-align: center;">0</td> </tr> <tr><td style="text-align: center;">3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>									1	Reject	↑ ↑	0	3	5	0	6	3	0	2	Scrap	↑ ↓	0	3	5	0	2	6	0	3										4										5									
1	Reject	↑ ↑	0	3	5	0	6	3	0																																																		
2	Scrap	↑ ↓	0	3	5	0	2	6	0																																																		
3																																																											
4																																																											
5																																																											
7.	CONTROL PLAN, OR AIM, <div style="text-align: center; margin-top: 10px;">Dimension - Size & Tolerance - as designed</div>																																																										
8.	NOTES																																																										

						0	2	3
TYPE, PRODUCTION PLANNING (2) TIME (3)								
CODE,					DESCRIPTION.			
0	2	3	0	1	Tooling time			

OUTPUT VARIABLE				<div style="display: flex; justify-content: space-around; border: 1px solid black; width: 100%;"> 02301 </div>					
1.	NAME, Tooling Time								
2.	DEFINITION. The time taken from the completion of a new design of product to the completion of the tooling required for it's manufacture								
3.	UNITS, Time: Weeks, days, hours, mins.								
4.	FUNCTION,								
	1	Product Design	6	Finance					
	2	Production Plan's ✓	7	Personnel					
	3	" Control	8	Secretarial		2	3	= Time	
	4	Purchasing	9	Gen. Mngt.					
	5	Marketing							
5.	LIMITATION,								
	1								
	2								
	3								
6.	INDUCTION,								
	1	Cost Production planning	↑ ↑		0	6	8	0	7
	2								1
	3								0
	4								
	5								
7.	CONTROL PLAN, OR AIM,								
	Tooling schedule								
8.	NOTES								

OUTPUT VARIABLE		0 3 2 0 3																																																											
1.	NAME, Load - Work Centre																																																												
2.	DEFINITION, The amount of work on order for manufacture at a given work centre, at a given point in time.																																																												
3.	UNITS, Products. M/c hrs or Man hrs																																																												
4.	FUNCTION,																																																												
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;">1</td> <td style="width: 40%;">Product Design</td> <td style="width: 5%;">6</td> <td style="width: 40%;">Finance</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>Production Plan's</td> <td>7</td> <td>Personnel</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>" Control ✓</td> <td>8</td> <td>Secretarial</td> <td></td> <td style="text-align: center;">3</td> <td>2 =</td> <td>load, Cap</td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>Purchasing</td> <td>9</td> <td>Gen. Mngt.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td>Marketing</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	1	Product Design	6	Finance								2	Production Plan's	7	Personnel								3	" Control ✓	8	Secretarial		3	2 =	load, Cap				4	Purchasing	9	Gen. Mngt.								5	Marketing														
1	Product Design	6	Finance																																																										
2	Production Plan's	7	Personnel																																																										
3	" Control ✓	8	Secretarial		3	2 =	load, Cap																																																						
4	Purchasing	9	Gen. Mngt.																																																										
5	Marketing																																																												
5.	LIMITATION,																																																												
	1																																																												
	2																																																												
	3																																																												
6.	INDUCTION,																																																												
	1	Free capacity - work centre	↑ ↓	0	3	2	1	4	2	0																																																			
	2	SWITCH at Zero to:-		S	W																																																								
	3	Overload - work centre	↑ ↑	0	3	2	1	5	1	0																																																			
	4																																																												
	5																																																												
7.	CONTROL PLAN, OR AIM,																																																												
	Planned work centre capacity																																																												
8.	NOTES An increase in "load - work centre" reduces free capacity (03214) until zero, when it becomes Overload (03215). Overload is negative Free capacity.																																																												

OUTPUT VARIABLE						<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">3</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">2</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">5</div>					
1.	NAME. Capacity - Factory										
2.	DEFINITION. The maximum possible product output which can be completed in a factory, with the present level of resources, during a specified period of time.										
3.	UNITS. Products, M/c hrs or Man hrs per period										
4.	FUNCTION.										
	1	Product Design		6	Finance						
	2	Production Plan'g		7	Personnel						
	3	" Control	✓	8	Secretarial		3	2	= Load, Cap.		
	4	Purchasing		9	Gen. Mngt.						
	5	Marketing									
5.	LIMITATION.										
	1	Production	↑ ↑	Max		0	3	5	0	1	5
	2										
	3										
6.	INDUCTION.										
	1	Free capacity - factory	↑ ↑			0	3	2	1	3	1
	2	SWITCH at zero to:-				S	W				
	3	Overload - factory	↑ ↓			0	3	2	1	6	2
	4										
	5										
7.	CONTROL PLAN, OR AIM.										
	Planned Factory capacity										
8.	NOTES An increase in "Capacity - factory" increases "Free capacity" (03213), but this is reversible and a reduction reduces 03214 to zero. When it becomes "Overload - factory" (03216)										

OUTPUT VARIABLE						<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">3</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">2</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">8</div>					
1.	NAME, Capacity - Work centre										
2.	DEFINITION. The time in M/c-hours or Man hours available on a machine, or other work centre type, for useful work (Load), during a given period.										
3.	UNITS. Products. M/c hrs or Man hrs per period										
4.	FUNCTION.										
	1	Product Design	6	Finance							
	2	Production Plan'g	7	Personnel							
	3	" Control	8	Secretarial		3	2	= Load, Cap.			
	4	Purchasing	9	Gen. Mngt.							
	5	Marketing									
5.	LIMITATION. L										
	1	Load work centre	↑ ↑	Max		0	3	2	0	3	5
	2										
	3										
6.	INDUCTION. C										
	1	Free capacity - work centre	↑ ↑			0	3	2	1	4	1
	2	SWITCH at zero to:-			S	W					
	3	Overload - work centre	↑ ↓			0	3	2	1	5	2
	4										
	5										
7.	CONTROL PLAN, OR AIM.										
	Planned w/c capacity										
8.	NOTES A reduction in "capacity - work centre", reduces free capacity (03214) until zero, when it becomes an Overload (03215)										

OUTPUT VARIABLE						<div style="display: flex; justify-content: space-around; border: 1px solid black; width: 100%;"> 03212 </div>				
1.	NAME. LOAD VARIATION - Amplitude									
2.	DEFINITION. The variation of load in a factory with time, on both sides of the mean load level.									
3.	UNITS. % mean load. ($\pm$ x %)									
4.	FUNCTION.									
	1	Product Design		6	Finance					
	2	Production Plan's		7	Personnel		↑			
	3	" Control	✓	8	Secretarial		3	2	= load. Cap.	
	4	Purchasing		9	Gen. Mngt.					
	5	Marketing								
5.	LIMITATION.									
	1									
	2									
	3									
6.	INDUCTION.									
	1	Controlability				↑ ↓	0	9	9	0
	2									
	3									
	4									
	5									
7.	CONTROL PLAN. OR AIM.									
	Planned load									
8.	NOTES									
	This variation is high with multi-cycle ordering									

OUTPUT VARIABLE		0 3 2 1 3										
1.	NAME, FREE CAPACITY - factory											
2.	DEFINITION, Unused capacity available for new work in a factory											
3.	UNITS, Products, M/c hrs or Man hrs per period											
4.	FUNCTION.											
	1	Product Design		6	Finance							
	2	Production Plan'g		7	Personnel							
	3	" Control	✓	8	Secretarial		3	2	= Load/cap.			
	4	Purchasing		9	Gen. Mngt.							
	5	Marketing										
5.	LIMITATION.											
	1											
	2											
	3											
6.	INDUCTION.											
	1	Flexibility		↑ ↑		0	9	9	0	1	1	0
	2											
	3											
	4											
	5											
7.	CONTROL PLAN, OR AIM.											
	Planned factory capacity											
8.	NOTES											
	A common synonym is "idle time - no work"											

OUTPUT VARIABLE		0 3 2 1 4								
1.	NAME. FREE CAPACITY - Work Centre									
2.	DEFINITION. Unused capacity available for new work at a work centre									
3.	UNITS. Products period. M/c hrs period Man Hrs Period.									
4.	FUNCTION.									
	1	Product Design		6	Finance					
	2	Production Plan's		7	Personnel					
	3	" Control	✓	8	Secretarial		3	2 = Load/cap		
	4	Purchasing		9	Gen. Mngt.					
	5	Marketing								
5.	LIMITATION.									
	1									
	2									
	3									
6.	INDUCTION.									
	1	Flexibility		↑ ↑		0	9	9	0	1 1 0
	2									
	3									
	4									
	5									
7.	CONTROL PLAN, OR AIM.									
	Planned work centre capacity									
8.	NOTES									
	A common synonym is "Idle time - no work"									

OUTPUT VARIABLE				<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">3</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">2</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">1</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">5</div>					
1.	NAME. OVERLOAD - Work Centre								
2.	DEFINITION. Any load assigned to a work centre which is in excess of work centre capacity								
3.	UNITS. Products. M/c hrs Man hrs.								
4.	FUNCTION.								
	1	Product Design	6	Finance					
	2	Production Plan's	7	Personnel					
	3	" Control ✓	8	Secretarial	3	2	= Load/cap		
	4	Purchasing	9	Gen. Mngt.					
	5	Marketing							
5.	LIMITATION.								
	1								
	2								
	3								
6.	INDUCTION.								
	1	Orders overdue	↑ ↑		0	3	4	0	7 1 0
	2								
	3								
	4								
	5								
7.	CONTROL PLAN, OR AIM.								
	Planned work centre capacity								
8.	NOTES								
	Overload is a Management error. Overload is negative "Free Capacity" (03214)								

OUTPUT VARIABLE		0 3 2 1 6								
1.	NAME. OVERLOAD - Factory									
2.	DEFINITION. Any load accepted by a factory which is in excess of factory capacity									
3.	UNITS.									
4.	FUNCTION.									
1	Product Design		6	Finance						
2	Production Plan'g		7	Personnel						
3	" Control	✓	8	Secretarial		3	2 = Load/cap			
4	Purchasing		9	Gen. Mngt.						
5	Marketing									
5.	LIMITATION.									
1										
2										
3										
6.	INDUCTION.									
1	Sales orders overdue	↑ ↑	0	3	4	0	9	1	0	
2										
3										
4										
5										
7.	CONTROL PLAN. OR AIM.									
	Planned factory capacity									
8.	NOTES									
	"Overload" is negative "Free capacity"									

OUTPUT VARIABLE					0	3	3
TYPE, PRODUCTION CONTROL (3)					TIME (3)		
CODE,					DESCRIPTION,		
0	3	3	0	1	Throughput time - manufacture		
			0	2	Set-up time/Op.		
			0	3	" " " /work centre/period		
			0	4			
			0	5	Operation time/Op		
			0	6	" " /year/work centre		
			0	7			
			0	8			
			0	9	Idle time - No Operator		
			1	0	" " Waiting help		
			1	1	" " Total		
			1	2			
			1	3			
			1	4	Down time/year/work centre		
			1	5	Waiting time		
			1	6	Storage time		

OUTPUT VARIABLE		0 3 3 0 1											
1.	NAME. THROUGHPUT TIME												
2.	DEFINITION. The time taken by one unit of material to pass through a factory, or through a specified portion of its material flow system.												
3.	UNITS. Time: Weeks, Days, Hours.												
4.	FUNCTION.												
	1	Product Design		6	Finance								
	2	Production Plan's		7	Personnel								
	3	" Control ✓		8	Secretarial		3	3	=	Time			
	4	Purchasing		9	Gen. Mngt.								
	5	Marketing											
5.	LIMITATION.												
	1												
	2												
	3												
6.	INDUCTION.												
	1	Stocks - total		↑ ↑		0	3	4	0	5	1	0	
	2	Customer service time		↑ ↑		0	5	3	0	2	1	0	
	3	IF and only IF:				I	F						
	4	Make for stock or to order		→		S	3	1	1	8	0		
	5												
7.	CONTROL PLAN. OR AIM.												
	Lead time - Manufacture												
8.	NOTES Throughput time does not always affect sales delivery time, if products are made for stock. The term "throughput time" can also be used, if qualified, to cover particular segments of the material flow system. e.g. "Component processing throughput time" covers the segment between Material & Finished part stores.												

OUTPUT VARIABLE										<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">3</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">3</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">2</div>						
1.	NAME. SET-UP TIME/OP															
2.	DEFINITION. The time taken on a machine or other work centre, to remove unwanted tooling used for previous part(s) and install new tooling for next part(s).															
3.	UNITS. Time: Days, Hours or Minutes per operation.															
4.	FUNCTION.															
	1	Product Design				6	Finance									
	2	Production Plan's				7	Personnel									
	3	" Control ✓				8	Secretarial				3	3 = TIME				
	4	Purchasing				9	Gen. Mngt.									
	5	Marketing														
5.	LIMITATION.															
	1															
	2															
	3															
6.	INDUCTION.															
	1	Throughput time					↑ ↑	0	3	3	0	1	1	0		
	2	Set-up time/period/work centre					↑ ↑	0	3	3	0	3	1	0		
	3	Cost - setting-up					↑ ↑	0	6	8	2	3	1	0		
	4															
	5															
7.	CONTROL PLAN, OR AIM.															
	Planned machine set-up time															
8.	NOTES															

OUTPUT VARIABLE									
<div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">0</div> <div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">3</div> <div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">3</div> <div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">0</div> <div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">3</div>									
1.	NAME, SET-UP TIME/WORK CENTRE/PERIOD								
2.	DEFINITION, Time spent by a machine, or other work centre being set-up, during a specified period of time.								
3.	UNITS, Time: Days, Hours or Minutes per period								
4.	FUNCTION,								
	1	Product Design		6	Finance				
	2	Production Plan's		7	Personnel				
	3	" Control	/	8	Secretarial		3	3 = TIME	
	4	Purchasing		9	Gen. Mngt.				
	5	Marketing							
5.	LIMITATION,								
	1								
	2								
	3								
6.	INDUCTION,								
	1	Capacity - work centre	↑ ↓			0	3	2	0
	2	Cost - Setting-up	↑ ↑			0	6	8	2
	3								
	4								
	5								
7.	CONTROL PLAN, OR AIM,								
	Planned set-up time/period								
8.	NOTES								
	See also "set-up time per operation" (03302) and "set-up quantity" (P307)								

OUTPUT VARIABLE				<div style="display: flex; justify-content: space-around; border: 1px solid black; padding: 2px;"> 03305 </div>					
1.	NAME. OP.TIME/ operation								
2.	DEFINITION. The time taken to complete a particular operation on one part.								
3.	UNITS. TIME: Days, Hrs, Mins or Secs. per operation								
4.	FUNCTION.								
	1	Product Design	6	Finance					
	2	Production Plan's	7	Personnel					
	3	" Control	8	Secretarial		3	3 = TIME		
	4	Purchasing	9	Gen. Mngt.					
	5	Marketing							
5.	LIMITATION.								
	1								
	2								
	3								
6.	INDUCTION.								
	1	Throughput time	↑ ↑		0	3	3	0	1 1 0
	2	Cost (Prod) - Direct total	↑ ↑		0	6	8	1 9	1 0
	3	Load - Work centre	↑ ↑		0	3	2	0 3	1 0
	4								
	5								
7.	CONTROL PLAN. OR AIM.								
	Standard time								
8.	NOTES								

OUTPUT VARIABLE										0	3	3	0	6	
1.	NAME, OP.TIME/YR/WORK CENTRE														
2.	DEFINITION, The total time that a particular work centre is being operated, during a specified period of time														
3.	UNITS, Time: Weeks, days, hours mins. per year														
4.	FUNCTION,														
	1	Product Design	6	Finance											
	2	Production Plan'g	7	Personnel											
	3	" Control	✓	8	Secretarial			3	3 = TIME						
	4	Purchasing		9	Gen. Mngt.										
	5	Marketing													
5.	LIMITATION,														
	1														
	2														
	3														
6.	INDUCTION,														
	1	Load - work centre	↑ ↑		0	3	2	0	3	1	0				
	2														
	3														
	4														
	5														
7.	CONTROL PLAN, OR AIM,														
	Planned capacity														
8.	NOTES														

OUTPUT VARIABLE										<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">3</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">3</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">9</div>									
1.	NAME, IDLE TIME - NO OPERATOR																		
2.	DEFINITION. Time during which a work centre is idle due to lack of an operator, during a specified period of time																		
3.	UNITS. Time: wrrks, days, hours or mins. per period																		
4.	FUNCTION.																		
	1	Product Design	6	Finance															
	2	Production Plan'g	7	Personnel															
	3	" Control ✓	8	Secretarial					3										
	4	Purchasing	9	Gen. Mngt.															
	5	Marketing																	
5.	LIMITATION.																		
	1																		
	2																		
	3																		
6.	INDUCTION.																		
	1	Idle time - Total										↑ ↑	0	3	3	1	1	1	0
	2	Throughput time										↑ ↑	0	3	3	0	1	1	0
	3																		
	4																		
	5																		
7.	CONTROL PLAN. OR AIM.																		
	Planned idle time																		
8.	NOTES																		

OUTPUT VARIABLE						<div style="display: flex; justify-content: space-around; border: 1px solid black; width: 100%;"> 03310 </div>						
1.	NAME, IDLE TIME - WAITING HELP											
2.	DEFINITION, Time during which a work centre is idle, due to waiting for help, during a particular period of time.											
3.	UNITS, Time: Days, Hours or minutes per period											
4.	FUNCTION.											
	1	Product Design	6	Finance								
	2	Production Plan's	7	Personnel								
	3	" Control ✓	8	Secretarial		3	3	- TIME				
	4	Purchasing	9	Gen. Mngt.								
	5	Marketing										
5.	LIMITATION.											
	1											
	2											
	3											
6.	INDUCTION.											
	1	Idle time - Total			↑ ↑	0	3	3	1	1	1	0
	2	Throughput time			↑ ↑	0	3	3	0	1	1	0
	3											
	4											
	5											
7.	CONTROL PLAN, OR AIM.											
	Planned idle time											
8.	NOTES											
	Includes waiting for Manager, Foreman, Inspector, Maintenance, Setter, etc.											

OUTPUT VARIABLE						<div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">0 3 3 1 1</div>																																																											
1.	NAME, IDLE TIME - TOTAL																																																																
2.	DEFINITION. Total time during a give period, when a work centre is serviceable but idle.																																																																
3.	UNITS. Time: Days, Hrs. on Mins. per period																																																																
4.	FUNCTION, <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 40%;">Product Design</td> <td style="width: 5%;"></td> <td style="width: 5%; text-align: center;">6</td> <td style="width: 40%;">Finance</td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> </tr> <tr> <td style="text-align: center;">2</td> <td>Production Plan's</td> <td></td> <td style="text-align: center;">7</td> <td>Personnel</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">3</td> <td>" Control ✓</td> <td></td> <td style="text-align: center;">8</td> <td>Secretarial</td> <td></td> <td style="text-align: center;">3</td> <td style="text-align: center;">3</td> <td colspan="3" style="text-align: center;">= TIME</td> </tr> <tr> <td style="text-align: center;">4</td> <td>Purchasing</td> <td></td> <td style="text-align: center;">9</td> <td>Gen. Mngt.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">5</td> <td>Marketing</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>										1	Product Design		6	Finance							2	Production Plan's		7	Personnel							3	" Control ✓		8	Secretarial		3	3	= TIME			4	Purchasing		9	Gen. Mngt.							5	Marketing									
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1	Capacity - Work centre	↑ ↓	0	3	2	0	8	2	0																																																								
2	Free Capacity - work centre	↑ ↓	0	3	2	1	4	2	0																																																								
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7.	CONTROL PLAN, OR AIM, <div style="border: 1px solid black; padding: 5px; margin-top: 5px; text-align: center;">Planned idle time</div>																																																																
8.	NOTES Idle time Total = "Idle time-no operator" 03309 plus "Idle time - Waiting help" 03310. It does <u>NOT</u> include "Free Capacity work centre". 03214. (for which "Idle time - no work" is a synonym).																																																																

OUTPUT VARIABLE						<div style="display: flex; justify-content: space-around; border: 1px solid black; width: 100%;"> 03314 </div>																																																							
1.	NAME, <div style="text-align: center; margin-top: 10px;">DOWN TIME/ YR / WORK CENTRE</div>																																																												
2.	DEFINITION, Time during which a work centre could not be operated, because it had broken down, during a specified period of time.																																																												
3.	UNITS, Time : Days, hours or mins. per period																																																												
4.	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> FUNCTION. <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 40%;">Product Design</td> <td style="width: 5%;"></td> <td style="width: 5%; text-align: center;">6</td> <td style="width: 40%;">Finance</td> <td style="width: 5%;"></td> </tr> <tr> <td style="text-align: center;">2</td> <td>Production Plan'g</td> <td></td> <td style="text-align: center;">7</td> <td>Personnel</td> <td></td> </tr> <tr> <td style="text-align: center;">3</td> <td>" Control ✓</td> <td></td> <td style="text-align: center;">8</td> <td>Secretarial</td> <td></td> </tr> <tr> <td style="text-align: center;">4</td> <td>Purchasing</td> <td></td> <td style="text-align: center;">9</td> <td>Gen. Mngt.</td> <td></td> </tr> <tr> <td style="text-align: center;">5</td> <td>Marketing</td> <td></td> <td></td> <td></td> <td></td> </tr> </table> </div> <div style="width: 50%; text-align: center;"> <div style="margin-bottom: 10px;">  <div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">3 3 = Time</div> </div> </div> </div>											1	Product Design		6	Finance		2	Production Plan'g		7	Personnel		3	" Control ✓		8	Secretarial		4	Purchasing		9	Gen. Mngt.		5	Marketing																								
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3	Free Capacity - Work centre	↑ ↓	0	3	2	1	4	2	0																																																				
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7.	CONTROL PLAN, OR AIM. <div style="text-align: center; margin-top: 10px;">Planned down time</div>																																																												
8.	NOTES																																																												

OUTPUT VARIABLE		<div style="border: 1px solid black; display: inline-block; padding: 2px;"> <div style="border: 1px solid black; display: inline-block; padding: 2px;">0</div> <div style="border: 1px solid black; display: inline-block; padding: 2px;">3</div> <div style="border: 1px solid black; display: inline-block; padding: 2px;">3</div> <div style="border: 1px solid black; display: inline-block; padding: 2px;">1</div> <div style="border: 1px solid black; display: inline-block; padding: 2px;">5</div> </div>								
1.	NAME, WAITING TIME									
2.	DEFINITION, The time spent by Materials waiting for useful work to be done on them, during a specified period of time.									
3.	UNITS, TIME: Days, hrs or Mins. per period									
4.	FUNCTION,									
	1	Product Design	6	Finance						
	2	Production Plan'g	7	Personnel						
	3	" Control ✓	8	Secretarial		3	3	= TIME		
	4	Purchasing	9	Gen. Mngt.						
	5	Marketing								
5.	LIMITATION,									
	1									
	2									
	3									
6.	INDUCTION,									
	1	Throughput time	↑ ↑		0	3	3	0	1	1
	2									
	3									
	4									
	5									
7.	CONTROL PLAN, OR AIM,									
	Planned waiting time									
8.	NOTES									
	1. Waiting Time = Throughput time - Op.time 2. Waiting Time includes storage time									

OUTPUT VARIABLE						<div style="display: flex; justify-content: space-around; border: 1px solid black; width: 100%;"> 03316 </div>						
1.	NAME, STORAGE TIME											
2.	DEFINITION, The time during which materials, at all stages of conversion, are held in stores, during a specified period of time											
3.	UNITS, TIME: Weeks, Days or Hours per period											
4.	FUNCTION,											
	1	Product Design	6	Finance								
	2	Production Plan'g	7	Personnel								
	3	" Control ✓	8	Secretarial		3	3	= TIME				
	4	Purchasing	9	Gen. Mngt.								
	5	Marketing										
5.	LIMITATION,											
	1											
	2											
	3											
6.	INDUCTION,											
	1	Throughput time ↑↑				0	3	3	0	1	1	0
	2											
	3											
	4											
	5											
7.	CONTROL PLAN, OR AIM,											
	Planned storage time											
8.	NOTES											

OUTPUT VARIABLE

0

3

4

TYPE, PRODUCTION CONTROL (3) QTY STATE (4)

CODE,

DESCRIPTION,

0	3	4	0	1	Stocks - Finished products
			0	2	" Purchases
			0	3	" Components - Made
			0	4	" Work-in-progress
			0	5	" Total
			0	6	Shortages
			0	7	Orders overdue
			0	8	Stock variation amplitude
			0	9	Sales orders overdue

OUTPUT VARIABLE				<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">0</td> <td style="width: 20px; text-align: center;">3</td> <td style="width: 20px; text-align: center;">4</td> <td style="width: 20px; text-align: center;">0</td> <td style="width: 20px; text-align: center;">1</td> </tr> </table>					0	3	4	0	1																																														
0	3	4	0	1																																																							
1.	NAME, STOCKS - FINISHED PRODUCTS																																																										
2.	DEFINITION, The quantity of a product, or products which are held in store ready for sale, on a given date.																																																										
3.	UNITS, Each or £ (at W.C. Value)																																																										
4.	FUNCTION. <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 35%;">Product Design</td> <td style="width: 5%; text-align: center;">6</td> <td style="width: 35%;">Finance</td> <td style="width: 10%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> </tr> <tr> <td style="text-align: center;">2</td> <td>Production Plan's</td> <td style="text-align: center;">7</td> <td>Personnel</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">3</td> <td>" Control ✓</td> <td style="text-align: center;">8</td> <td>Secretarial</td> <td></td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> <td colspan="3" style="text-align: center;">+ Qty State</td> </tr> <tr> <td style="text-align: center;">4</td> <td>Purchasing</td> <td style="text-align: center;">9</td> <td>Gen. Mngt.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">5</td> <td>Marketing</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>									1	Product Design	6	Finance							2	Production Plan's	7	Personnel							3	" Control ✓	8	Secretarial		3	4	+ Qty State			4	Purchasing	9	Gen. Mngt.							5	Marketing								
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7.	CONTROL PLAN, OR AIM, <div style="text-align: center; margin-top: 10px;">Stock programme</div>																																																										
8.	NOTES																																																										

OUTPUT VARIABLE									
1.	NAME. STOCKS - PURCHASES								
2.	DEFINITION. The quantity of purchased direct material held in stores on a given date.								
3.	UNITS. Each or £ (at w.c. value)								
4.	FUNCTION.								
	1	Product Design	6	Finance					
	2	Production Plan's	7	Personnel					
	3	" Control ✓	8	Secretarial		3	4 = Qty state		
	4	Purchasing	9	Gen. Mngt.					
	5	Marketing							
5.	LIMITATION.								
	1								
	2								
	3								
6.	INDUCTION.								
	1	Stocks - Total	↑ ↑		0	3	4	0	5
	2	Throughput time	↑ ↑		0	3	3	0	1
	3								
	4								
	5								
7.	CONTROL PLAN, OR AIM.								
	Stock budget								
8.	NOTES								
	Includes all purchased direct materials and parts.								

OUTPUT VARIABLE																																																											
<div style="border: 1px solid black; display: inline-block; padding: 2px 5px;"> <div style="display: flex; justify-content: space-between; width: 100%;"> 034C3 </div> </div>																																																											
1.	NAME, <div style="margin-left: 40px;">STOCKS - FINISHED COMPONENTS - Made</div>																																																										
2.	DEFINITION. The quantity of components held in stores on a given date, which were made in the factory and are completed ready for assembly.																																																										
3.	UNITS. Each of £ (at W.c. value)																																																										
4.	FUNCTION. <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 35%;">Product Design</td> <td style="width: 5%; text-align: center;">6</td> <td style="width: 35%;">Finance</td> <td style="width: 10%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> </tr> <tr> <td style="text-align: center;">2</td> <td>Production Plan'g</td> <td style="text-align: center;">7</td> <td>Personnel</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">3</td> <td>" Control</td> <td style="text-align: center;">8</td> <td>Secretarial</td> <td></td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> <td>+</td> <td>Qty</td> <td>state</td> </tr> <tr> <td style="text-align: center;">4</td> <td>Purchasing</td> <td style="text-align: center;">9</td> <td>Gen. Mngt.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">5</td> <td>Marketing</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>									1	Product Design	6	Finance							2	Production Plan'g	7	Personnel							3	" Control	8	Secretarial		3	4	+	Qty	state	4	Purchasing	9	Gen. Mngt.							5	Marketing								
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5.	LIMITATION. <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr><td style="width: 5%; text-align: center;">1</td><td style="width: 60%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td></tr> <tr><td style="text-align: center;">2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>									1										2										3																													
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6.	INDUCTION. <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 45%;">Stocks - Total</td> <td style="width: 10%; text-align: center;">↑ ↑</td> <td style="width: 5%; text-align: center;">0</td> <td style="width: 5%; text-align: center;">3</td> <td style="width: 5%; text-align: center;">4</td> <td style="width: 5%; text-align: center;">0</td> <td style="width: 5%; text-align: center;">5</td> <td style="width: 5%; text-align: center;">1</td> <td style="width: 5%; text-align: center;">0</td> </tr> <tr> <td style="text-align: center;">2</td> <td>Throughput time</td> <td style="text-align: center;">↑ ↑</td> <td style="text-align: center;">0</td> <td style="text-align: center;">3</td> <td style="text-align: center;">3</td> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">0</td> </tr> <tr><td style="text-align: center;">3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>									1	Stocks - Total	↑ ↑	0	3	4	0	5	1	0	2	Throughput time	↑ ↑	0	3	3	0	1	1	0	3										4										5									
1	Stocks - Total	↑ ↑	0	3	4	0	5	1	0																																																		
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7.	CONTROL PLAN, OR AIM. <div style="margin-left: 40px; margin-top: 10px;">Stock Budget</div>																																																										
8.	NOTES																																																										

OUTPUT VARIABLE										0	3	4	0	4	
1.	NAME.														
	STOCKS OF W.I.P														
2.	DEFINITION. The quantity of materials of various stages of conversion: which is held in a factory, excluding any held in controlled stores.														
3.	UNITS. Each of £ (at w.c. value)														
4.	FUNCTION.														
	1	Product Design		6	Finance										
	2	Production Plan'g		7	Personnel										
	3	" Control	✓	8	Secretarial										
	4	Purchasing		9	Gen. Mngt.										
	5	Marketing													
5.	LIMITATION.														
	1														
	2														
	3														
6.	INDUCTION.														
	1	Stocks - Total		↑ ↑		0	3	4	0	5	1	0			
	2	Throughput time		↑ ↑		0	3	3	0	1	1	0			
	3														
	4														
	5														
7.	CONTROL PLAN. OR AIM.														
	Stock budget														
8.	NOTES Excludes: bought materials in stores (03402), Made Components in a "Finished parts store" (03403) and Finished products in a "Finished product store" (03401).														

OUTPUT VARIABLE																																																											
<div style="border: 1px solid black; display: inline-block; padding: 2px 5px;"> <div style="display: flex; justify-content: space-between; width: 100%;"> 03405 </div> </div>																																																											
1.	NAME. <div style="text-align: center;">STOCKS - TOTAL</div>																																																										
2.	DEFINITION. All the materials at all stages of conversion, held in the stores and workshops of a company.																																																										
3.	UNITS. <div style="text-align: center;">Each or £ (at w.c. value)</div>																																																										
4.	FUNCTION. <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 40%;">Product Design</td> <td style="width: 5%;"></td> <td style="width: 5%; text-align: center;">6</td> <td style="width: 40%;">Finance</td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> </tr> <tr> <td style="text-align: center;">2</td> <td>Production Plan's</td> <td></td> <td style="text-align: center;">7</td> <td>Personnel</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">3</td> <td>" Control ✓</td> <td></td> <td style="text-align: center;">8</td> <td>Secretarial</td> <td></td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> <td colspan="2">Qty state</td> </tr> <tr> <td style="text-align: center;">4</td> <td>Purchasing</td> <td></td> <td style="text-align: center;">9</td> <td>Gen. Mngt.</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">5</td> <td>Marketing</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>									1	Product Design		6	Finance						2	Production Plan's		7	Personnel						3	" Control ✓		8	Secretarial		3	4	Qty state		4	Purchasing		9	Gen. Mngt.						5	Marketing								
1	Product Design		6	Finance																																																							
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5.	LIMITATION. <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr><td style="width: 5%; text-align: center;">1</td><td style="width: 60%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td></tr> <tr><td style="text-align: center;">2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>									1										2										3																													
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6.	INDUCTION. <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 55%;">Investment - Stocks & WIP</td> <td style="width: 10%; text-align: center;">↑ ↑</td> <td style="width: 5%; text-align: center;">0</td> <td style="width: 5%; text-align: center;">6</td> <td style="width: 5%; text-align: center;">6</td> <td style="width: 5%; text-align: center;">0</td> <td style="width: 5%; text-align: center;">8</td> <td style="width: 5%; text-align: center;">1</td> <td style="width: 5%; text-align: center;">0</td> </tr> <tr> <td style="text-align: center;">2</td> <td>Cost(Prod)- Indirect(handle & Store)</td> <td style="text-align: center;">↑ ↑</td> <td style="text-align: center;">0</td> <td style="text-align: center;">6</td> <td style="text-align: center;">8</td> <td style="text-align: center;">2</td> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> <td style="text-align: center;">0</td> </tr> <tr> <td style="text-align: center;">3</td> <td>Storage time</td> <td style="text-align: center;">↑ ↑</td> <td style="text-align: center;">0</td> <td style="text-align: center;">3</td> <td style="text-align: center;">3</td> <td style="text-align: center;">1</td> <td style="text-align: center;">6</td> <td style="text-align: center;">1</td> <td style="text-align: center;">0</td> </tr> <tr><td style="text-align: center;">4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>									1	Investment - Stocks & WIP	↑ ↑	0	6	6	0	8	1	0	2	Cost(Prod)- Indirect(handle & Store)	↑ ↑	0	6	8	2	0	1	0	3	Storage time	↑ ↑	0	3	3	1	6	1	0	4										5									
1	Investment - Stocks & WIP	↑ ↑	0	6	6	0	8	1	0																																																		
2	Cost(Prod)- Indirect(handle & Store)	↑ ↑	0	6	8	2	0	1	0																																																		
3	Storage time	↑ ↑	0	3	3	1	6	1	0																																																		
4																																																											
5																																																											
7.	CONTROL PLAN, OR AIM. <div style="text-align: center;">Stock budget</div>																																																										
8.	NOTES Includes: Finished products (03401); Purchases (03402); Finished																																																										

OUTPUT VARIABLE										0	3	4	0	6	
1.	NAME, SHORTAGES														
2.	DEFINITION, Parts missing from sets required to complete an assembly programme														
3.	UNITS, Each														
4.	FUNCTION,														
	1	Product Design	6	Finance											
	2	Production Plan'g	7	Personnel											
	3	" Control ✓	8	Secretarial			3	4 = Qty State							
	4	Purchasing	9	Gen. Mngt.											
	5	Marketing													
5.	LIMITATION,														
	1														
	2														
	3														
6.	INDUCTION,														
	1	Idle time - Total	↑ ↑	0	3	3	1	1	1	0					
	2	Throughput time	↑ ↑	0	3	2	0	1	1	0					
	3														
	4														
	5														
7.	CONTROL PLAN, OR AIM,														
	Parts List														
8.	NOTES														

OUTPUT VARIABLE				<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">3</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">4</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">7</div>					
1.	NAME, ORDERS OVERDUE (Mfgr)								
2.	DEFINITION, Shop orders still not completed, for which due dates have already passed.								
3.	UNITS, NO								
4.	FUNCTION.								
	1	Product Design	6	Finance					
	2	Production Plan's	7	Personnel					
	3	" Control ✓	8	Secretarial		3	4 = Qty State		
	4	Purchasing	9	Gen. Mngt.					
	5	Marketing							
5.	LIMITATION.								
	1								
	2								
	3								
6.	INDUCTION.								
	1	Throughput time	↑ ↑		0	3	3	0	1 1 0
	2								
	3								
	4								
	5								
7.	CONTROL PLAN, OR AIM.								
	Shop Orders								
8.	NOTES								

OUTPUT VARIABLE				<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">3</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">4</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">8</div>						
1.	NAME, STOCK VARIATION - Amplitude									
2.	DEFINITION, The variation of stocks on both sides of the main stock level, during a specified period of time									
3.	UNITS, % mean value ($\pm \times \%$)									
4.	FUNCTION,									
	1	Product Design	6	Finance						
	2	Production Plan'g	7	Personnel						
	3	" Control ✓	8	Secretarial		3	4 = Qty state			
	4	Purchasing	9	Gen. Mngt.						
	5	Marketing								
5.	LIMITATION,									
	1									
	2									
	3									
6.	INDUCTION,									
	1	Controlability	↑ ↑		0	9	9	0	2	2
	2									
	3									
	4									
	5									
7.	CONTROL PLAN, OR AIM,									
	Nil variation									
8.	NOTES									
	Ref: Perfect Flow project Burbidge.									

OUTPUT VARIABLE		<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">3</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">4</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">9</div>																																																	
1.	NAME, SALES ORDERS - OVERDUE																																																		
2.	DEFINITION, Sales orders which have not been delivered to customers by their promise dates, at a particular moment in time.																																																		
3.	UNITS, No.																																																		
4.	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 35%;">Product Design</td> <td style="width: 5%; text-align: center;">6</td> <td style="width: 35%;">Finance</td> <td style="width: 10%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> </tr> <tr> <td style="text-align: center;">2</td> <td>Production Plan's</td> <td style="text-align: center;">7</td> <td>Personnel</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">3</td> <td>" Control ✓</td> <td style="text-align: center;">8</td> <td>Secretarial</td> <td></td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> <td style="text-align: center;">=</td> <td style="text-align: center;">Qty</td> <td style="text-align: center;">State</td> </tr> <tr> <td style="text-align: center;">4</td> <td>Purchasing</td> <td style="text-align: center;">9</td> <td>Gen. Mngt.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">5</td> <td>Marketing</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	1	Product Design	6	Finance							2	Production Plan's	7	Personnel							3	" Control ✓	8	Secretarial		3	4	=	Qty	State	4	Purchasing	9	Gen. Mngt.							5	Marketing								
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3	" Control ✓	8	Secretarial		3	4	=	Qty	State																																										
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3																																																			
4																																																			
5																																																			
7.	CONTROL PLAN, OR AIM.																																																		
	Quotation																																																		
8.	NOTES																																																		

OUTPUT VARIABLE						0	3	5
TYPE,						PRODUCTION CONTROL (3) QTY RATE (5)		
CODE,					DESCRIPTION,			
0	3	5	0	1	Production/period			
			0	2	Scrap/Period			
			0	3	Waste/Period			
			0	4				
			0	5				
			0	6	Rejects/Period			
			0	7	Requirement quantity/Period			

OUTPUT VARIABLE		<div style="border: 1px solid black; padding: 2px; display: inline-block;"> 0 3 5 0 1 </div>																																																																
1.	NAME,	PRODUCTION																																																																
2.	DEFINITION,	The quantity of a product which is completed ready for sale in a given period of time																																																																
3.	UNITS,	No. per period																																																																
4.	FUNCTION,	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;">1</td> <td style="width: 35%;">Product Design</td> <td style="width: 5%;">6</td> <td style="width: 35%;">Finance</td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> </tr> <tr> <td>2</td> <td>Production Plan'g</td> <td>7</td> <td>Personnel</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>" Control /</td> <td>8</td> <td>Secretarial</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>Purchasing</td> <td>9</td> <td>Gen. Mngt.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td>Marketing</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>										1	Product Design	6	Finance								2	Production Plan'g	7	Personnel								3	" Control /	8	Secretarial								4	Purchasing	9	Gen. Mngt.								5	Marketing									
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4	Purchasing	9	Gen. Mngt.																																																															
5	Marketing																																																																	
5.	LIMITATION,	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 5%;">1</td><td style="width: 60%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td></tr> <tr><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>										1											2											3																																
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3																																																																		
6.	INDUCTION,	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;">1</td> <td style="width: 45%;">Expenditure</td> <td style="width: 10%;">↑ ↑</td> <td style="width: 5%;">0</td> <td style="width: 5%;">6</td> <td style="width: 5%;">8</td> <td style="width: 5%;">0</td> <td style="width: 5%;">2</td> <td style="width: 5%;">1</td> <td style="width: 5%;">0</td> </tr> <tr> <td>2</td> <td>Productivity</td> <td>↑ ↑</td> <td>0</td> <td>9</td> <td>9</td> <td>0</td> <td>5</td> <td>1</td> <td>0</td> </tr> <tr> <td>3</td> <td>Cost - Total per piece</td> <td>↑ ↓</td> <td>0</td> <td>6</td> <td>8</td> <td>2</td> <td>4</td> <td>2</td> <td>0</td> </tr> <tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>										1	Expenditure	↑ ↑	0	6	8	0	2	1	0	2	Productivity	↑ ↑	0	9	9	0	5	1	0	3	Cost - Total per piece	↑ ↓	0	6	8	2	4	2	0	4										5														
1	Expenditure	↑ ↑	0	6	8	0	2	1	0																																																									
2	Productivity	↑ ↑	0	9	9	0	5	1	0																																																									
3	Cost - Total per piece	↑ ↓	0	6	8	2	4	2	0																																																									
4																																																																		
5																																																																		
7.	CONTROL PLAN, OR AIM,	<div style="border: 1px solid black; padding: 5px; min-height: 40px;"> Production programme </div>																																																																
8.	NOTES	<p>If production increases. Indirect costs are shared by more products and total cost per piece falls.</p>																																																																

OUTPUT VARIABLE		0 3 5 0 2									
1.	NAME, SCRAP										
2.	DEFINITION, The quantity of components, or of part-worked materials which are made unsuitable for production due to errors in processing in a give time period.										
3.	UNITS, No. per period										
4.	FUNCTION,										
	1 Product Design	6 Finance									
	2 Production Plan'g	7 Personnel									
	3 " Control ✓	8 Secretarial				3	5	= Qty rate			
	4 Purchasing	9 Gen. Mngt.									
	5 Marketing										
5.	LIMITATION,										
	1										
	2										
	3										
6.	INDUCTION,										
	1 Cost (Prod) - Direct mtc	↑ ↑	0	6	8	1	7	1	0		
	2										
	3										
	4										
	5										
7.	CONTROL PLAN, OR AIM,										
	Scrap allowance										
8.	NOTES Scrap cannot be recovered. Rejects can be repaired (03506)										

OUTPUT VARIABLE										<div style="display: flex; justify-content: space-around; border: 1px solid black; width: 100px; height: 20px;"> 03579 </div>					
1.	NAME, <div style="text-align: center; margin-top: 10px;">WASTE</div>														
2.	DEFINITION. The quantity of material which is wasted during processing -- eg Swarf in machining - during a given period of time														
3.	UNITS, <div style="text-align: center; margin-top: 10px;">Weight per period</div>														
4.	FUNCTION.														
	1	Product Design		6	Finance										
	2	Production Plan'g		7	Personnel										
	3	" Control ✓		8	Secretarial			3	5	= Qty ratio					
	4	Purchasing		9	Gen. Mngt.										
	5	Marketing													
5.	LIMITATION.														
	1														
	2														
	3														
6.	INDUCTION.														
	1	Cost (Prod) - Direct mte				↑ ↑		0	6	8	1	7	1	0	
	2														
	3														
	4														
	5														
7.	CONTROL PLAN, OR AIM.														
	Planned Waste														
8.	NOTES														

OUTPUT VARIABLE										<div style="display: flex; justify-content: space-around; border: 1px solid black; width: 100%;"> 03506 </div>																																																																																					
1.	NAME. <div style="text-align: center; margin-top: 10px;">REJECTS</div>																																																																																														
2.	DEFINITION. The quantity of parts made unsuitable for production, due to errors in processing, in a given period, which can be repaired.																																																																																														
3.	UNITS. <div style="text-align: center; margin-top: 10px;">No. per period</div>																																																																																														
4.	FUNCTION. <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 40%;">Product Design</td> <td style="width: 5%; text-align: center;">6</td> <td style="width: 40%;">Finance</td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> </tr> <tr> <td style="text-align: center;">2</td> <td>Production Plan'g</td> <td style="text-align: center;">7</td> <td>Personnel</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">3</td> <td>" Control ✓</td> <td style="text-align: center;">8</td> <td>Secretarial</td> <td></td> <td></td> <td style="text-align: center;">3</td> <td style="text-align: center;">5</td> <td style="text-align: center;">=</td> <td style="text-align: center;">Qty</td> <td style="text-align: center;">Rate</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">4</td> <td>Purchasing</td> <td style="text-align: center;">9</td> <td>Gen. Mngt.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">5</td> <td>Marketing</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>															1	Product Design	6	Finance													2	Production Plan'g	7	Personnel													3	" Control ✓	8	Secretarial			3	5	=	Qty	Rate						4	Purchasing	9	Gen. Mngt.													5	Marketing														
1	Product Design	6	Finance																																																																																												
2	Production Plan'g	7	Personnel																																																																																												
3	" Control ✓	8	Secretarial			3	5	=	Qty	Rate																																																																																					
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6.	INDUCTION. <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 55%;">Cost Prod - Direct Material</td> <td style="width: 10%; text-align: center;">↑ ↑</td> <td style="width: 5%; text-align: center;">C</td> <td style="width: 5%; text-align: center;">5</td> <td style="width: 5%; text-align: center;">8</td> <td style="width: 5%; text-align: center;">1</td> <td style="width: 5%; text-align: center;">7</td> <td style="width: 5%; text-align: center;">1</td> <td style="width: 5%; text-align: center;">0</td> </tr> <tr><td style="text-align: center;">2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>															1	Cost Prod - Direct Material	↑ ↑	C	5	8	1	7	1	0	2										3										4										5																																							
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7.	CONTROL PLAN, OR AIM. <div style="text-align: center; margin-top: 10px;">Planned rejects.</div>																																																																																														
8.	NOTES <div style="margin-top: 10px;">Rejects are repairable. Scrap cannot be recovered (Q3502)</div>																																																																																														

OUTPUT VARIABLE										<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">3</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">5</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">7</div>																																																																																					
1.	NAME. <div style="text-align: center; margin-top: 10px;">REQUIREMENT QUANTITY</div>																																																																																														
2.	DEFINITION. The total quantity of a component which is required in a given period of time.																																																																																														
3.	UNITS. No. per period																																																																																														
4.	FUNCTION. <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 40%;">Product Design</td> <td style="width: 5%;"></td> <td style="width: 5%; text-align: center;">6</td> <td style="width: 40%;">Finance</td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> </tr> <tr> <td style="text-align: center;">2</td> <td>Production Plan'g</td> <td></td> <td style="text-align: center;">7</td> <td>Personnel</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">3</td> <td>" Control ✓</td> <td></td> <td style="text-align: center;">8</td> <td>Secretarial</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">4</td> <td>Purchasing</td> <td></td> <td style="text-align: center;">9</td> <td>Gen. Mngt.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">5</td> <td>Marketing</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <div style="margin-top: 10px; text-align: center;"> <div style="border: 1px solid black; display: inline-block; padding: 2px 5px; margin-top: 5px;">3 5 = Qty Rate</div> </div>															1	Product Design		6	Finance												2	Production Plan'g		7	Personnel												3	" Control ✓		8	Secretarial												4	Purchasing		9	Gen. Mngt.												5	Marketing														
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7.	CONTROL PLAN, OR AIM. <div style="text-align: center; margin-top: 10px;">Production programme</div>																																																																																														
8.	NOTES <div style="text-align: center; margin-top: 10px;">Includes Assembly, and spares sales.</div>																																																																																														

OUTPUT VARIABLE										<div style="display: flex; justify-content: space-around; border: 1px solid black; width: 100px; margin: 0 auto;"> 4301 </div>																																																																																					
1.	NAME. <div style="text-align: center; margin-top: 10px;">SUPPLY TIME - purchases</div>																																																																																														
2.	DEFINITION. The time interval between placing a purchase order and receiving delivery of the goods.																																																																																														
3.	UNITS. <div style="text-align: center; margin-top: 10px;">Time; weeks, Days, Hrs.</div>																																																																																														
4.	FUNCTION. <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 35%;">Product Design</td> <td style="width: 5%; text-align: center;">6</td> <td style="width: 35%;">Finance</td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> </tr> <tr> <td style="text-align: center;">2</td> <td>Production Plan'g</td> <td style="text-align: center;">7</td> <td>Personnel</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">3</td> <td>" Control</td> <td style="text-align: center;">8</td> <td>Secretarial</td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: center;">4</td> <td style="text-align: center;">2</td> <td style="text-align: center;">=</td> <td style="text-align: center;">Time</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">4</td> <td>Purchasing</td> <td style="text-align: center;">✓</td> <td>9 Gen. Mngt.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">5</td> <td>Marketing</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>															1	Product Design	6	Finance													2	Production Plan'g	7	Personnel													3	" Control	8	Secretarial					4	2	=	Time					4	Purchasing	✓	9 Gen. Mngt.													5	Marketing														
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6.	INDUCTION. <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 60%;">Flexibility</td> <td style="width: 10%; text-align: center;">↑ ↓</td> <td style="width: 10%; text-align: center;">0</td> <td style="width: 10%; text-align: center;">9</td> <td style="width: 10%; text-align: center;">2</td> <td style="width: 10%; text-align: center;">0</td> <td style="width: 10%; text-align: center;">1</td> <td style="width: 10%; text-align: center;">2</td> <td style="width: 10%; text-align: center;">0</td> </tr> <tr><td style="text-align: center;">2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>															1	Flexibility	↑ ↓	0	9	2	0	1	2	0	2										3										4										5																																							
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7.	CONTROL PLAN, OR AIM. <div style="text-align: center; margin-top: 10px;">Lead time - purchases</div>																																																																																														
8.	NOTES																																																																																														

OUTPUT VARIABLE						0	4	4
TYPE, PURCHASING (4)						QTY STATE (4)		
CODE,					DESCRIPTION.			
0	4	4	0	1	Over-due purchases			
			0	2	Purchased items			

OUTPUT VARIABLE		<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">0</td> <td style="width: 20px; text-align: center;">4</td> <td style="width: 20px; text-align: center;">4</td> <td style="width: 20px; text-align: center;">0</td> <td style="width: 20px; text-align: center;">1</td> </tr> </table>						0	4	4	0	1																																							
0	4	4	0	1																																															
1.	NAME, OVERDUE PURCHASES																																																		
2.	DEFINITION. Items which have not arrived by the delivery time specified in the contract, at a particular moment in time.																																																		
3.	UNITS, No.																																																		
4.	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 35%;">Product Design</td> <td style="width: 5%; text-align: center;">6</td> <td style="width: 35%;">Finance</td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> </tr> <tr> <td style="text-align: center;">2</td> <td>Production Plan's</td> <td style="text-align: center;">7</td> <td>Personnel</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">3</td> <td>" Control</td> <td style="text-align: center;">8</td> <td>Secretarial</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">4</td> <td>Purchasing</td> <td style="text-align: center;">9</td> <td>Gen. Mngt.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">5</td> <td>Marketing</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <div style="margin-top: 10px;"> <div style="display: inline-block; border: 1px solid black; padding: 2px; text-align: center;">4</div> <div style="display: inline-block; vertical-align: middle; margin-left: 5px;">4 = Qty State</div> </div>	1	Product Design	6	Finance							2	Production Plan's	7	Personnel							3	" Control	8	Secretarial							4	Purchasing	9	Gen. Mngt.							5	Marketing								
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5.	LIMITATION,																																																		
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3																																																			
6.	INDUCTION,																																																		
1	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;">Storages</td> <td style="width: 40%; text-align: center;">↑ ↑</td> <td style="width: 10%; text-align: center;">0</td> <td style="width: 10%; text-align: center;">3</td> <td style="width: 10%; text-align: center;">4</td> <td style="width: 10%; text-align: center;">0</td> <td style="width: 10%; text-align: center;">6</td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> </tr> <tr><td style="text-align: center;">2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>	Storages	↑ ↑	0	3	4	0	6			2									3									4									5													
Storages	↑ ↑	0	3	4	0	6																																													
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7.	CONTROL PLAN, OR AIM, Purchase Orders																																																		
8.	NOTES																																																		

OUTPUT VARIABLE		<div style="display: flex; justify-content: space-around; border: 1px solid black; width: 100%;"> 04402 </div>									
1.	NAME.	PURCHASED ITEMS									
2.	DEFINITION. The number of different items which are being purchased, at a particular moment in time										
3.	UNITS.										
No.											
4.	FUNCTION.										
1	Product Design	6	Finance								
2	Production Plan's	7	Personnel								
3	" Control	8	Secretarial								
4	Purchasing	✓ 9	Gen. Mngt.								
5	Marketing										
<div style="position: relative; height: 40px;"> ↑ </div>											
4											
4 = Key State											
5.	LIMITATION.										
1											
2											
3											
6.	INDUCTION.										
1	Value added	↑ ↓									
2	Cost (Mngt.) - Purchasing	↑ ↑									
3											
4											
5											
7.	CONTROL PLAN. OR AIM.										
Purchase orders											
8.	NOTES										

OUTPUT VARIABLE						0	4	8
TYPE, PURCHASING (4)						MONEY RATE (8)		
CODE,					DESCRIPTION,			
0	4	6	0	1	Purchase Price			
			0	2				

OUTPUT VARIABLE		<div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">0 4 8 0 1</div>								
1.	NAME, PURCHASE PRICE									
2.	DEFINITION, The price paid per unit, for particular purchased goods, or services.									
3.	UNITS, £ per unit									
4.	FUNCTION,									
1	Product Design	6	Finance							
2	Production Plan's	7	Personnel							
3	" Control	8	Secretarial	1	6	= Moneystate				
4	Purchasing	9	Gen. Mngt.							
5	Marketing									
5.	LIMITATION,									
1										
2										
3										
6.	INDUCTION,									
1	Cost (Prod) - Total	↑ ↑	0	6	8	2	5	1	0	
2										
3										
4										
5										
7.	CONTROL PLAN, OR AIM,									
Quotation										
8.	NOTES	Depends partly on the Market and partly on Purchasing Skills.								

OUTPUT VARIABLE					0 5 3		
TYPE, MARKETING (5)					TIME (3)		
CODE.					DESCRIPTION.		
0	5	3	0	1	Distribution time		
			0	2	Customer service time		
			0	3			

OUTPUT VARIABLE		<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">0</td> <td style="width: 20px; text-align: center;">5</td> <td style="width: 20px; text-align: center;">3</td> <td style="width: 20px; text-align: center;">0</td> <td style="width: 20px; text-align: center;">1</td> </tr> </table>								0	5	3	0	1
0	5	3	0	1										
1.	NAME, DISTRIBUTION TIME													
2.	DEFINITION. Time taken by finished products between despatch from the factory and delivery to final customer													
3.	UNITS. Time: Weeks, days, hours													
4.	FUNCTION,													
	1	Product Design	6	Finance										
	2	Production Plan'g	7	Personnel										
	3	" Control	8	Secretarial		5	3	= Time						
	4	Purchasing	9	Gen. Mngt.										
	5	Marketing	✓											
5.	LIMITATION,													
	1													
	2													
	3													
6.	INDUCTION,													
	1	Customer's Service time			↑ ↑	0	5	3	0	2				
	2													
	3													
	4													
	5													
7.	CONTROL PLAN, OR AIM,													
	Quotation													
8.	NOTES													

OUTPUT VARIABLE				<div style="display: flex; justify-content: space-around; border: 1px solid black; width: 100px;"> 05302 </div>																																																												
1.	NAME, Customer Service Time																																																															
2.	DEFINITION, The time taken between receipt of a customers order and delivery of the goods.																																																															
3.	UNITS, Time: Weeks, days, hours																																																															
4.	FUNCTION, <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 35%;">Product Design</td> <td style="width: 5%;"></td> <td style="width: 5%; text-align: center;">6</td> <td style="width: 35%;">Finance</td> <td style="width: 10%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> </tr> <tr> <td style="text-align: center;">2</td> <td>Production Plan's</td> <td></td> <td style="text-align: center;">7</td> <td>Personnel</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">3</td> <td>" Control</td> <td></td> <td style="text-align: center;">8</td> <td>Secretarial</td> <td></td> <td style="text-align: center;">5</td> <td style="text-align: center;">3</td> <td colspan="2" style="text-align: center;">= Time</td> </tr> <tr> <td style="text-align: center;">4</td> <td>Purchasing</td> <td></td> <td style="text-align: center;">9</td> <td>Gen. Mngt.</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">5</td> <td>Marketing</td> <td style="text-align: center;">✓</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>									1	Product Design		6	Finance						2	Production Plan's		7	Personnel						3	" Control		8	Secretarial		5	3	= Time		4	Purchasing		9	Gen. Mngt.						5	Marketing	✓												
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4	Purchasing		9	Gen. Mngt.																																																												
5	Marketing	✓																																																														
5.	LIMITATION, <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr><td style="width: 5%; text-align: center;">1</td><td style="width: 60%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td></tr> <tr><td style="text-align: center;">2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>									1										2										3																																		
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6.	INDUCTION, <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 40%;">Sales - Total</td> <td style="width: 10%; text-align: center;">↑ ↓</td> <td style="width: 5%;"></td> <td style="width: 5%; text-align: center;">0</td> <td style="width: 5%; text-align: center;">5</td> <td style="width: 5%; text-align: center;">5</td> <td style="width: 5%; text-align: center;">0</td> <td style="width: 5%; text-align: center;">3</td> <td style="width: 5%; text-align: center;">2</td> <td style="width: 5%; text-align: center;">0</td> </tr> <tr><td style="text-align: center;">2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>									1	Sales - Total	↑ ↓		0	5	5	0	3	2	0	2											3											4											5										
1	Sales - Total	↑ ↓		0	5	5	0	3	2	0																																																						
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3																																																																
4																																																																
5																																																																
7.	CONTROL PLAN, OR AIM, <div style="text-align: right; margin-top: 10px;">Quotation - Delivery Promise</div>																																																															
8.	NOTES																																																															

OUTPUT VARIABLE						0	5	4
TYPE, MARKETING (5)						QTY STATE (4)		
CODE,					DESCRIPTION,			
0	5	4	0	1	Demand Variation			
			0	2				

OUTPUT VARIABLE				<div style="display: flex; justify-content: space-around; width: 100%;"> 0 5 4 0 1 </div>																																																							
1.	NAME, <div style="text-align: center; margin-top: 10px;">DEMAND VARIATION</div>																																																										
2.	DEFINITION. The variation with time in market demand for a product on both sides of the mean demand rate																																																										
3.	UNITS. %eg $\pm$ x %																																																										
4.	<div style="display: flex;"> <div style="flex: 1;"> FUNCTION, <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 40%;">Product Design</td> <td style="width: 5%; text-align: center;">6</td> <td style="width: 40%;">Finance</td> </tr> <tr> <td style="text-align: center;">2</td> <td>Production Plan's</td> <td style="text-align: center;">7</td> <td>Personnel</td> </tr> <tr> <td style="text-align: center;">3</td> <td>" Control</td> <td style="text-align: center;">8</td> <td>Secretarial</td> </tr> <tr> <td style="text-align: center;">4</td> <td>Purchasing</td> <td style="text-align: center;">9</td> <td>Gen. Mngt.</td> </tr> <tr> <td style="text-align: center;">5</td> <td>Marketing</td> <td style="text-align: center;">/</td> <td></td> </tr> </table> </div> <div style="flex: 1; border-left: 1px solid black; padding-left: 10px; margin-left: 10px;"> <div style="text-align: center; margin-bottom: 10px;"> </div> <div style="display: flex; align-items: center;"> <div style="border: 2px solid black; padding: 2px 10px; margin-right: 10px;">5</div> <div>4 = Qty state</div> </div> </div> </div>									1	Product Design	6	Finance	2	Production Plan's	7	Personnel	3	" Control	8	Secretarial	4	Purchasing	9	Gen. Mngt.	5	Marketing	/																															
1	Product Design	6	Finance																																																								
2	Production Plan's	7	Personnel																																																								
3	" Control	8	Secretarial																																																								
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5	Marketing	/																																																									
5.	LIMITATION, <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr><td style="width: 5%; text-align: center;">1</td><td style="width: 60%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td></tr> <tr><td style="text-align: center;">2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>									1								2								3																																	
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6.	INDUCTION, <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 40%;">Sensitivity</td> <td style="width: 10%; text-align: center;">$\uparrow \downarrow$</td> <td style="width: 5%; text-align: center;">0</td> <td style="width: 5%; text-align: center;">9</td> <td style="width: 5%; text-align: center;">9</td> <td style="width: 5%; text-align: center;">0</td> <td style="width: 5%; text-align: center;">4</td> <td style="width: 5%; text-align: center;">2</td> <td style="width: 5%; text-align: center;">0</td> </tr> <tr><td style="text-align: center;">2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>									1	Sensitivity	$\uparrow \downarrow$	0	9	9	0	4	2	0	2										3										4										5									
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7.	CONTROL PLAN, OR AIM, <div style="text-align: center; margin-top: 10px;">Mean demand rate</div>																																																										
8.	NOTES																																																										

OUTPUT VARIABLE					0	5	5
TYPE, MARKETING (5)					QTY RATE (5)		
CODE,					DESCRIPTION,		
0	5	5	0	1	Sales - Home		
			0	2	" - Export		
			0	3	" - Total		

OUTPUT VARIABLE										<div style="display: flex; justify-content: space-around; border: 1px solid black; width: 100px;"> 05502 </div>																																																																																					
1.	NAME, <div style="text-align: center; margin-top: 10px;">SALES - EXPORT</div>																																																																																														
2.	DEFINITION. The quantity of products sold in Export markets in a given period of time																																																																																														
3.	UNITS. Qty. per period																																																																																														
4.	FUNCTION. <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 40%;">Product Design</td> <td style="width: 5%;"></td> <td style="width: 5%; text-align: center;">6</td> <td style="width: 40%;">Finance</td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> </tr> <tr> <td style="text-align: center;">2</td> <td>Production Plan's</td> <td></td> <td style="text-align: center;">7</td> <td>Personnel</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">3</td> <td>" Control</td> <td></td> <td style="text-align: center;">8</td> <td>Secretarial</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">4</td> <td>Purchasing</td> <td></td> <td style="text-align: center;">9</td> <td>Gen. Mngt.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">5</td> <td>Marketing</td> <td style="text-align: center;">✓</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <div style="margin-top: 10px; text-align: center;"> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">5</div> <div style="display: inline-block; vertical-align: middle; text-align: center;">↑</div> <div style="display: inline-block; padding: 0 10px;">= Qty rate</div> </div>															1	Product Design		6	Finance												2	Production Plan's		7	Personnel												3	" Control		8	Secretarial												4	Purchasing		9	Gen. Mngt.												5	Marketing	✓													
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6.	INDUCTION. <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 60%;">Sales - Total</td> <td style="width: 10%; text-align: center;">↑ ↑</td> <td style="width: 5%;"></td> <td style="width: 5%; text-align: center;">0</td> <td style="width: 5%; text-align: center;">5</td> <td style="width: 5%; text-align: center;">5</td> <td style="width: 5%; text-align: center;">0</td> <td style="width: 5%; text-align: center;">3</td> <td style="width: 5%; text-align: center;">1</td> <td style="width: 5%; text-align: center;">0</td> </tr> <tr><td style="text-align: center;">2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>															1	Sales - Total	↑ ↑		0	5	5	0	3	1	0	2											3											4											5																																			
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7.	CONTROL PLAN, OR AIM. <div style="text-align: center; margin-top: 10px;">Sales programme</div>																																																																																														
8.	NOTES																																																																																														

OUTPUT VARIABLE										<div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">0</div> <div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">5</div> <div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">5</div> <div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">0</div> <div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">3</div>																																																																																									
1.	NAME. <div style="text-align: center; margin-top: 10px;">SALES - TOTAL</div>																																																																																																		
2.	DEFINITION. The quantity of product invoiced and delivered to customers in a given period of time																																																																																																		
3.	UNITS. Qty. per period																																																																																																		
4.	FUNCTION. <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 35%;">Product Design</td> <td style="width: 5%; text-align: center;">6</td> <td style="width: 35%;">Finance</td> <td style="width: 10%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> </tr> <tr> <td style="text-align: center;">2</td> <td>Production Plan'g</td> <td style="text-align: center;">7</td> <td>Personnel</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">3</td> <td>" Control</td> <td style="text-align: center;">8</td> <td>Secretarial</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">4</td> <td>Purchasing</td> <td style="text-align: center;">9</td> <td>Gen. Mngt.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">5</td> <td>Marketing</td> <td style="text-align: center;">✓</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <div style="margin-top: 10px; text-align: center;"> <div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">5</div> ↑ </div> <div style="margin-top: 10px; text-align: right;"> 5 = Qty Rate </div>															1	Product Design	6	Finance													2	Production Plan'g	7	Personnel														3	" Control	8	Secretarial														4	Purchasing	9	Gen. Mngt.														5	Marketing	✓														
1	Product Design	6	Finance																																																																																																
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1	Revenue	↑ ↑	0	6	8	0	1	1	0																																																																																										
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4																																																																																																			
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7.	CONTROL PLAN, OR AIM. <div style="text-align: center; margin-top: 10px;">Sales programme</div>																																																																																																		
8.	NOTES																																																																																																		

OUTPUT VARIABLE										0	6	6			
TYPE,										FINANCE (6)			MONEY STATE (6)		
CODE,					DESCRIPTION,										
0	6	6	0	1	Capital - Shares										
			0	2	" Loans										
			0	3	" Credit										
			0	4	" Cash										
			0	5	" Total										
			0	6	Investment - Land & Buildings										
			0	7	" Fixed Assets										
			0	8	" Stocks & W.I.P										
			0	9	" Miscellaneous										
			1	0	Total										
			1	1	Obsolescence - Buildings										
			1	2	" Fixed assets										
			1	3	" Stocks & W.I.P										
			1	4	" Total										
			1	5	Debtors										
			1	6	Creditors										

OUTPUT VARIABLE		0 6 6 0 1										
1.	NAME. CAPITAL - SHARES											
2.	DEFINITION. Money subscribed by share holders to buy shares in the company											
3.	UNITS. £ at a point in time											
4.	FUNCTION.											
	1	Product Design	6	Finance	/							
	2	Production Plan'g	7	Personnel								
	3	" Control	8	Secretarial		6	6	=	£	State		
	4	Purchasing	9	Gen. Mngt.								
	5	Marketing										
5.	LIMITATION.											
	1											
	2											
	3											
6.	INDUCTION.											
	1	Capital total	↑ ↑			0	6	6	0	5	1	0
	2											
	3											
	4											
	5											
7.	CONTROL PLAN, OR AIM.											
	Capital budget											
8.	NOTES											

OUTPUT VARIABLE				<div style="display: flex; justify-content: space-around; border: 1px solid black; width: 100%;"> 06602 </div>					
1.	NAME. CAP ITAL - LOANS								
2.	DEFINITION. Money borrowed from banks or other sources								
3.	UNITS. £ at a point in time								
4.	FUNCTION.								
1	Product Design		6	Finance	✓				
2	Production Plan'g		7	Personnel		↑			
3	" Control		8	Secretarial		6	6 = £	STATE	
4	Purchasing		9	Gen. Mngt.					
5	Marketing								
5.	LIMITATION.								
1									
2									
3									
6.	INDUCTION.								
1	Capital - Total	↑ ↑	0	6	6	0	5	1	0
2									
3									
4									
5									
7.	CONTROL PLAN, OR AIM.								
	Capital budget								
8.	NOTES								

OUTPUT VARIABLE						<div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">0 6 6 0 3</div>				
1.	NAME. CAP ITAL - CREDIT									
2.	DEFINITION. The difference between money owed by customers due to credit, and money owed to suppliers due to credit (can be + or -).									
3.	UNITS. £ at a point in time									
4.	FUNCTION.									
1	Product Design		6	Finance	✓	↑				
2	Production Plan's		7	Personnel						
3	" Control		8	Secretarial		6	6	£	STATE	
4	Purchasing		9	Gen. Mngt.						
5	Marketing									
5.	LIMITATION.									
1										
2										
3										
6.	INDUCTION.									
1	Captial total		↑ ↑			0	6	6	0	5 1 0
2										
3										
4										
5										
7.	CONTROL PLAN, OR AIM,									
	Capital Budget									
8.	NOTES									

OUTPUT VARIABLE		0 6 6 0 4				
1.	NAME, CAP ITAL - CASH					
2.	DEFINITION, Petty cash bank credit					
3.	UNITS, £ at a point in time					
4.	FUNCTION,					
1	Product Design	6	Finance	✓		
2	Production Plan's	7	Personnel			
3	" Control	8	Secretarial		6	6 = £ STATE
4	Purchasing	9	Gen. Mngt.			
5	Marketing					
5.	LIMITATION,					
1						
2						
3						
6.	INDUCTION,					
1	Capital - Total	↑ ↑	0	6	6	0 5 1 0
2						
3						
4						
5						
7.	CONTROL PLAN, OR AIM,					
	Capital Budget					
8.	NOTES					

OUTPUT VARIABLE		<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">6</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">6</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">5</div>																																																											
1.	NAME, <div style="text-align: center; margin-top: 10px;">CAP ITAL - TOTAL</div>																																																												
2.	DEFINITION, All the assets owned by a company, including fixed circulating and liquid capital																																																												
3.	UNITS, <div style="text-align: center; margin-top: 10px;">£ at a point in time</div>																																																												
4.	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;"></th> <th style="width: 35%;">FUNCTION,</th> <th style="width: 5%;"></th> <th style="width: 35%;"></th> <th style="width: 10%;"></th> <th style="width: 10%;"></th> <th style="width: 10%;"></th> <th style="width: 10%;"></th> <th style="width: 10%;"></th> <th style="width: 10%;"></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td>Product Design</td> <td style="text-align: center;">6</td> <td>Finance</td> <td style="text-align: center;">✓</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">2</td> <td>Production Plan'g</td> <td style="text-align: center;">7</td> <td>Personnel</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">3</td> <td>" Control</td> <td style="text-align: center;">8</td> <td>Secretarial</td> <td></td> <td style="text-align: center;">6</td> <td style="text-align: center;">6</td> <td colspan="3" style="text-align: center;">= £ STATE</td> </tr> <tr> <td style="text-align: center;">4</td> <td>Purchasing</td> <td style="text-align: center;">9</td> <td>Gen. Mngt.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">5</td> <td>Marketing</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		FUNCTION,									1	Product Design	6	Finance	✓						2	Production Plan'g	7	Personnel							3	" Control	8	Secretarial		6	6	= £ STATE			4	Purchasing	9	Gen. Mngt.							5	Marketing								
	FUNCTION,																																																												
1	Product Design	6	Finance	✓																																																									
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1	Production ↑ ↑ Max	0	3	5	0	1	5	1																																																					
2																																																													
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5																																																													
7.	CONTROL PLAN, OR AIM, <div style="text-align: center; margin-top: 20px;">Capital Budget or AIM</div>																																																												
8.	NOTES																																																												

OUTPUT VARIABLE				<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">0</td> <td style="width: 20px; text-align: center;">6</td> <td style="width: 20px; text-align: center;">6</td> <td style="width: 20px; text-align: center;">0</td> <td style="width: 20px; text-align: center;">6</td> </tr> </table>						0	6	6	0	6
0	6	6	0	6										
1.	NAME. INVESTMENT- LAND & BUILDINGS													
2.	DEFINITION. Capital tied-up in land & buildings													
3.	UNITS. f at a point in time													
4.	FUNCTION.													
	1	Product Design	6	Finance	✓									
	2	Production Plan's	7	Personnel										
	3	" Control	8	Secretarial		6	6	= f	STATE					
	4	Purchasing	9	Gen. Mngt.										
	5	Marketing												
5.	LIMITATION.													
	1													
	2													
	3													
6.	INDUCTION.													
	1	Investment - Total	↑ ↑			0	6	6	1	0				
	2													
	3													
	4													
	5													
7.	CONTROL PLAN, OR AIM.													
	Investment budget													
8.	NOTES													

OUTPUT VARIABLE		<div style="border: 1px solid black; display: inline-block; padding: 2px;"> <div style="border: 1px solid black; display: inline-block; padding: 0 5px;">0</div> <div style="border: 1px solid black; display: inline-block; padding: 0 5px;">6</div> <div style="border: 1px solid black; display: inline-block; padding: 0 5px;">6</div> <div style="border: 1px solid black; display: inline-block; padding: 0 5px;">0</div> <div style="border: 1px solid black; display: inline-block; padding: 0 5px;">7</div> </div>																																																																
1.	NAME.	INVESTMENT - FIXED ASSETS																																																																
2.	DEFINITION.	Capital tied-up in Machines and fixtures																																																																
3.	UNITS.	£.at a point in time																																																																
4.	FUNCTION.	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 35%;">Product Design</td> <td style="width: 5%; text-align: center;">6</td> <td style="width: 35%;">Finance</td> <td style="width: 5%; text-align: center;">✓</td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> </tr> <tr> <td style="text-align: center;">2</td> <td>Production Plan's</td> <td style="text-align: center;">7</td> <td>Personnel</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">3</td> <td>" Control</td> <td style="text-align: center;">8</td> <td>Secretarial</td> <td></td> <td style="text-align: center;">6</td> <td style="text-align: center;">6</td> <td>=</td> <td>£</td> <td>STATE</td> <td></td> </tr> <tr> <td style="text-align: center;">4</td> <td>Purchasing</td> <td style="text-align: center;">9</td> <td>Gen. Mngt.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">5</td> <td>Marketing</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>										1	Product Design	6	Finance	✓							2	Production Plan's	7	Personnel								3	" Control	8	Secretarial		6	6	=	£	STATE		4	Purchasing	9	Gen. Mngt.								5	Marketing									
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6.	INDUCTION.	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 60%;">Investment - total</td> <td style="width: 5%; text-align: center;">↑ ↑</td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> </tr> <tr> <td style="text-align: center;">2</td> <td></td> <td></td> <td style="text-align: center;">0</td> <td style="text-align: center;">6</td> <td style="text-align: center;">6</td> <td style="text-align: center;">1</td> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> <td style="text-align: center;">0</td> <td></td> </tr> <tr><td style="text-align: center;">3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>										1	Investment - total	↑ ↑									2			0	6	6	1	0	1	0		3											4											5										
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5																																																																		
7.	CONTROL PLAN, OR AIM.	Investment budget																																																																
8.	NOTES																																																																	

OUTPUT VARIABLE		0 6 6 0 8				
1.	NAME, INVESTMENT - STOCKS & WIP					
2.	DEFINITION, Capital tied-up in stocks and work in progress					
3.	UNITS, £ at a point in time					
4.	FUNCTION,					
1	Product Design	6	Finance	✓		
2	Production Plan'g	7	Personnel			
3	" Control	8	Secretarial		6	6 = 9 STATE
4	Purchasing	9	Gen. Mngt.			
5	Marketing					
5.	LIMITATION,					
1						
2						
3						
6.	INDUCTION,					
1	Investment - total ↑ ↑	0	6	6	1	0 1 0
2						
3						
4						
5						
7.	CONTROL PLAN, OR AIM,					
	Investment budget					
8.	NOTES					

OUTPUT VARIABLE				<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">0</td> <td style="width: 20px; text-align: center;">6</td> <td style="width: 20px; text-align: center;">6</td> <td style="width: 20px; text-align: center;">0</td> <td style="width: 20px; text-align: center;">9</td> </tr> </table>					0	6	6	0	9
0	6	6	0	9									
1.	NAME, INVESTMENT - MISC												
2.	DEFINITION, Purchased stocks and shares, bank deposits and other investments outside the company												
3.	UNITS, £ at a point in time												
4.	FUNCTION,												
1	Product Design		6	Finance		↑							
2	Production Plan'g		7	Personnel		6	6 = £ STATE						
3	" Control		8	Secretarial									
4	Purchasing		9	Gen. Mngt.									
5	Marketing												
5.	LIMITATION,												
1													
2													
3													
6.	INDUCTION,												
1	Investment - total		↑ ↑		0	6	6	1	0				
2													
3													
4													
5													
7.	CONTROL PLAN, OR AIM,												
	Investment Budget												
8.	NOTES												

OUTPUT VARIABLE						<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">6</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">6</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">1</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div>					
1.	NAME, INVESTMENT - TOTAL										
2.	DEFINITION, The total of all the investments of a company										
3.	UNITS, £ at a point in time										
4.	FUNCTION,										
	1	Product Design		6	Finance	✓					
	2	Production Plan's		7	Personnel						
	3	" Control		8	Secretarial		6	6	=	£	STATE
	4	Purchasing		9	Gen. Mngt.						
	5	Marketing									
5.	LIMITATION,										
	1										
	2										
	3										
6.	INDUCTION,										
	1	Cash	↑ ↓		0	6	6	0	4	2	0
	2	Profitability	↑ ↓		0	9	9	0	6	2	0
	3										
	4										
	5										
7.	CONTROL PLAN, OR AIM,										
	Investment budget										
8.	NOTES										
	Investment is to capital as load is to capacity										

OUTPUT VARIABLE				<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">6</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">6</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">1</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">1</div>						
1.	NAME. OBSOLESCENCE - Buildings									
2.	DEFINITION. Loss of value due to the development of new and more economical types of building or location.									
3.	UNITS. £ at a point in time									
4.	FUNCTION.									
	1	Product Design	6	Finance	✓					
	2	Production Plan's	7	Personnel						
	3	" Control	8	Secretarial		6	6	=	1	STATE
	4	Purchasing	9	Gen. Mngt.						
	5	Marketing								
5.	LIMITATION.									
	1									
	2									
	3									
6.	INDUCTION.									
	1	Obsolescence total	↑ ↑			0	6	6	1	4
	2	Cost - Total	↑ ↑			0	6	8	2	5
	3									
	4									
	5									
7.	CONTROL PLAN. OR AIM.									
	Forecast									
8.	NOTES									
	Buildings may become obsolete due to such factors as the cost of maintenance, heating, lighting etc., or because their location makes it difficult to recruit employees or involves excessive costs (high rates for example).									

OUTPUT VARIABLE		0 6 6 1 2											
1.	NAME, OBSOLESCENCE - FIXED ASSETS												
2.	DEFINITION, Loss of value due to the development of new and more economical types of plant or equipment.												
3.	UNITS, £ at a point in time												
4.	FUNCTION,												
	1	Product Design		6	Finance	✓							
	2	Production Plan'g		7	Personnel								
	3	" Control		8	Secretarial		6	6 = 9	STATE				
	4	Purchasing		9	Gen. Mngt.								
	5	Marketing											
5.	LIMITATION,												
	1												
	2												
	3												
6.	INDUCTION,												
	1	Obsolescence total				↑ ↑	0	6	6	1	4	1	0
	2												
	3												
	4												
	5												
7.	CONTROL PLAN, OR AIM,												
	Forecast												
8.	NOTES												

OUTPUT VARIABLE						<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">6</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">6</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">1</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">3</div>							
1.	NAME. OBSOLESCENCE - Stocks & WIP												
2.	DEFINITION. A reduction in the value of stocks and work in progress due to changes in a company's product range, or in the design of it's products.												
3.	UNITS. £ at a point in time												
4.	FUNCTION.												
	1	Product Design		6	Finance	✓							
	2	Production Plan's		7	Personnel		↑						
	3	" Control		8	Secretarial		6	6	=	£	STATE		
	4	Purchasing		9	Gen. Mngt.								
	5	Marketing											
5.	LIMITATION.												
	1												
	2												
	3												
6.	INDUCTION.												
	1	Obsolescence total				↑ ↑	0	6	6	1	4	1	0
	2	Capital				↑ ↓	0	6	6	0	5	2	0
	3												
	4												
	5												
7.	CONTROL PLAN, OR AIM.												
	Forecast												
8.	NOTES												

OUTPUT VARIABLE						0 6 6 1 4					
1.	NAME, OBSOLESCENCE - Total										
2.	DEFINITION, Total losses due to obsolescence										
3.	UNITS, £ at a point in time										
4.	FUNCTION,										
	1	Product Design	6	Finance	✓						
	2	Production Plan's	7	Personnel							
	3	" Control	8	Secretarial		6	6 = £ STATE				
	4	Purchasing	9	Gen. Mngt.							
	5	Marketing									
5.	LIMITATION,										
	1										
	2										
	3										
6.	INDUCTION,										
	1	Capital	↑ ↓	0	6	6	0	5	2	0	
	2	Cost - Total	↑ ↑	0	6	8	2	5	1	0	
	3										
	4										
	5										
7.	CONTROL PLAN, OR AIM,										
	Forecast										
8.	NOTES										

OUTPUT VARIABLE		<div style="display: flex; justify-content: space-around; border: 1px solid black; width: 100%;"> 06615 </div>																																																											
1.	NAME, DEBTORS																																																												
2.	DEFINITION, Total money owed to the company by customers																																																												
3.	UNITS, £ at a point in time																																																												
4.	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;"></th> <th style="width: 35%;"></th> <th style="width: 5%;"></th> <th style="width: 35%;"></th> <th style="width: 10%;"></th> <th style="width: 5%;"></th> <th style="width: 5%;"></th> <th style="width: 5%;"></th> <th style="width: 5%;"></th> <th style="width: 5%;"></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td>Product Design</td> <td style="text-align: center;">6</td> <td>Finance</td> <td style="text-align: center;">✓</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">2</td> <td>Production Plan'g</td> <td style="text-align: center;">7</td> <td>Personnel</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">3</td> <td>" Control</td> <td style="text-align: center;">8</td> <td>Secretarial</td> <td></td> <td style="text-align: center;">6</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">4</td> <td>Purchasing</td> <td style="text-align: center;">9</td> <td>Gen. Mngt.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">5</td> <td>Marketing</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <div style="text-align: center; margin-top: 5px;"> 6 = E STATE </div>											1	Product Design	6	Finance	✓						2	Production Plan'g	7	Personnel							3	" Control	8	Secretarial		6					4	Purchasing	9	Gen. Mngt.							5	Marketing								
1	Product Design	6	Finance	✓																																																									
2	Production Plan'g	7	Personnel																																																										
3	" Control	8	Secretarial		6																																																								
4	Purchasing	9	Gen. Mngt.																																																										
5	Marketing																																																												
5.	LIMITATION,																																																												
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6.	INDUCTION,																																																												
1	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;"></th> <th style="width: 55%;"></th> <th style="width: 5%;"></th> <th style="width: 5%;"></th> <th style="width: 5%;"></th> <th style="width: 5%;"></th> <th style="width: 5%;"></th> <th style="width: 5%;"></th> <th style="width: 5%;"></th> <th style="width: 5%;"></th> </tr> </thead> <tbody> <tr> <td></td> <td>Capital - credit</td> <td style="text-align: center;">↑ ↓</td> <td></td> <td style="text-align: center;">0</td> <td style="text-align: center;">6</td> <td style="text-align: center;">6</td> <td style="text-align: center;">0</td> <td style="text-align: center;">3</td> <td style="text-align: center;">2</td> </tr> <tr> <td style="text-align: center;">2</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">3</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">4</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">5</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>												Capital - credit	↑ ↓		0	6	6	0	3	2	2										3										4										5									
	Capital - credit	↑ ↓		0	6	6	0	3	2																																																				
2																																																													
3																																																													
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5																																																													
7.	CONTROL PLAN, OR AIM,																																																												
	Capital budget																																																												
8.	NOTES																																																												
	<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 10px;"> Equip val m </div> <div>Equipment to lending money to customers.</div> </div>																																																												

OUTPUT VARIABLE				0 6 6 1 6					
1.	NAME, CREDITORS								
2.	DEFINITION. Total money owed by the company to it's suppliers of goods & services								
3.	UNITS, £ at a point in time								
4.	FUNCTION.								
	1	Product Design	6	Finance	✓				
	2	Production Plan'g	7	Personnel					
	3	" Control	8	Secretarial		6	6 = E STATE		
	4	Purchasing	9	Gen. Mngt.					
	5	Marketing							
5.	LIMITATION.								
	1								
	2								
	3								
6.	INDUCTION.								
	1	Capital - credit	↑ ↑		0	6	6	0	3
	2								
	3								
	4								
	5								
7.	CONTROL PLAN, OR AIM.								
	Capital budget								
8.	NOTES								
	Equivalent to borrowing money from suppliers								

OUTPUT VARIABLE					0	6	8
TYPE,		FINANCE (6)			MONEY RATE (8)		
CODE,					DESCRIPTION,		
0	6	8	0	1	Revenue		
			0	2	Expenditure		
			0	3	Profit		
			0	4	Value Added		
			0	5			
			0	6	Cost (Mngt) - Product design		
			0	7	" " Production planning		
			0	8	" " Production Control		
			0	9	" " Purchasing		
			1	0	" " Marketing		
			1	1	" " Financial		
			1	2	" " Personnel		
			1	3	" " Secretarial		
			1	4	" " General		
			1	5			
			1	6	Cost(Prod) - Direct Labour (Components)		
			1	7	" " " Mtl. "		
			1	8	" " " Labour (Assembly)		
			1	9	" " " Total		
			2	0	" " Indirect (Handling & Store)		
			2	1	" " (Maintenance)		
			2	2	" " (Quality Control)		
			2	3	" " (Setting)		
			2	4	" " " Total		
			2	5	" " Total		
			2	6	Customers servicing costs		

OUTPUT VARIABLE				<div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">0 6 8 0 1</div>						
1.	NAME, REVENUE									
2.	DEFINITION, Money received for goods and services in a given period of time.									
3.	UNITS, £ per period									
4.	FUNCTION,									
	1	Product Design	6	Finance	✓					
	2	Production Plan's	7	Personnel						
	3	" Control	8	Secretarial		6	8	= £ RATE		
	4	Purchasing	9	Gen. Mngt.						
	5	Marketing								
5.	LIMITATION,									
	1									
	2									
	3									
6.	INDUCTION,									
	1	Profit	↑ ↑			0	6	8	0	3 1 0
	2									
	3									
	4									
	5									
7.	CONTROL PLAN, OR AIM,									
	Budget									
8.	NOTES									

OUTPUT VARIABLE										<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">6</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">8</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">2</div>						
1.	NAME. <div style="text-align: center; margin-top: 10px;">EXPENDITURE</div>															
2.	DEFINITION. Money expended for materials, salaries, wages, and other charges in a given period of time															
3.	UNITS. <div style="text-align: center; margin-top: 10px;">£ per period</div>															
4.	FUNCTION.															
	1	Product Design		6	Finance	✓										
	2	Production Plan's		7	Personnel											
	3	" Control		8	Secretarial			6	8 = £ RATE							
	4	Purchasing		9	Gen. Mngt.											
	5	Marketing														
5.	LIMITATION.															
	1															
	2															
	3															
6.	INDUCTION.															
	1	Profit		↑ ↓			0	6	8	0	3	2	0			
	2															
	3															
	4															
	5															
7.	CONTROL PLAN, OR AIM.															
	Budget															
8.	NOTES															

OUTPUT VARIABLE				<div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">0 6 8 0 3</div>					
1.	NAME, PROFIT								
2.	DEFINITION, The surplus of Revenue over Total Cost in a particular period of time								
3.	UNITS, £ per period								
4.	FUNCTION.								
1	Product Design		6	Finance	✓				
2	Production Plan'g		7	Personnel		↑			
3	" Control		8	Secretarial		6	8 = £ RATE		
4	Purchasing		9	Gen. Mngt.					
5	Marketing								
5.	LIMITATION.								
1									
2									
3									
6.	INDUCTION.								
1	Capital - Total	↑ ↑	0	6	6	0	5	1	0
2	Profitability	↑ ↑	0	9	9	0	6	1	0
3									
4									
5									
7.	CONTROL PLAN, OR AIM.								
	Profit budget								
8.	NOTES								

OUTPUT VARIABLE				<div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">0</div> <div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">6</div> <div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">8</div> <div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">0</div> <div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">4</div>					
1.	NAME, VALUE ADDED								
2.	DEFINITION,								
3.	UNITS, £ per period								
4.	FUNCTION.								
1	Product Design		6	Finance	✓	↑			
2	Production Plan's		7	Personnel					
3	" Control		8	Secretarial		6	8 = £ RATE		
4	Purchasing		9	Gen. Mngt.					
5	Marketing								
5.	LIMITATION,								
1									
2									
3									
6.	INDUCTION,								
1									
2									
3									
4									
5									
7.	CONTROL PLAN, OR AIM,								
	Budget								
8.	NOTES								

OUTPUT VARIABLE						0 6 8 0 6					
1.	NAME. COST (Mngt) - Product Design										
2.	DEFINITION. Cost of designing, proving and developing new products for sale										
3.	UNITS. £ per period										
4.	FUNCTION.										
	1	Product Design		6	Finance	✓					
	2	Production Plan'g		7	Personnel						
	3	" Control		8	Secretarial		6	8	=	£	RATE
	4	Purchasing		9	Gen. Mngt.						
	5	Marketing									
5.	LIMITATION.										
	1										
	2										
	3										
6.	INDUCTION.										
	1	Cost (Prod) Indirect Total	↑ ↑		0	6	8	2	4	1	0
	2										
	3										
	4										
	5										
7.	CONTROL PLAN. OR AIM.										
	Budget										
8.	NOTES										

OUTPUT VARIABLE		<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">6</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">8</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">7</div>																																																																
1.	NAME,	COST (Mngt) - Production Planning																																																																
2.	DEFINITION,	Cost of planning methods, tooling and proving production methods for new products, or modifications during a given period.																																																																
3.	UNITS,	£ per period																																																																
4.	FUNCTION.	<table border="1" style="width: 100%; border-collapse: collapse; font-size: 0.8em;"> <tr> <td style="width: 5%;">1</td> <td style="width: 35%;">Product Design</td> <td style="width: 5%;">6</td> <td style="width: 35%;">Finance</td> <td style="width: 10%; text-align: center;">✓</td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> </tr> <tr> <td>2</td> <td>Production Plan'g</td> <td>7</td> <td>Personnel</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>" Control</td> <td>8</td> <td>Secretarial</td> <td></td> <td style="text-align: center;">6</td> <td style="text-align: center;">8</td> <td>=</td> <td>£</td> <td>RATE</td> <td></td> </tr> <tr> <td>4</td> <td>Purchasing</td> <td>9</td> <td>Gen. Mngt.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td>Marketing</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>										1	Product Design	6	Finance	✓							2	Production Plan'g	7	Personnel								3	" Control	8	Secretarial		6	8	=	£	RATE		4	Purchasing	9	Gen. Mngt.								5	Marketing									
1	Product Design	6	Finance	✓																																																														
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4	Purchasing	9	Gen. Mngt.																																																															
5	Marketing																																																																	
5.	LIMITATION,	<table border="1" style="width: 100%; border-collapse: collapse; font-size: 0.8em;"> <tr><td style="width: 5%;">1</td><td style="width: 60%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td></tr> <tr><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>										1											2											3																																
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6.	INDUCTION,	<table border="1" style="width: 100%; border-collapse: collapse; font-size: 0.8em;"> <tr> <td style="width: 5%;">1</td> <td style="width: 55%;">Cost (Prod) - Indirect total</td> <td style="width: 5%; text-align: center;">↑ ↑</td> <td style="width: 5%; text-align: center;">0</td> <td style="width: 5%; text-align: center;">6</td> <td style="width: 5%; text-align: center;">8</td> <td style="width: 5%; text-align: center;">2</td> <td style="width: 5%; text-align: center;">4</td> <td style="width: 5%; text-align: center;">1</td> <td style="width: 5%; text-align: center;">0</td> </tr> <tr><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>										1	Cost (Prod) - Indirect total	↑ ↑	0	6	8	2	4	1	0	2										3										4										5														
1	Cost (Prod) - Indirect total	↑ ↑	0	6	8	2	4	1	0																																																									
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5																																																																		
7.	CONTROL PLAN, OR AIM,	Budget																																																																
8.	NOTES																																																																	

OUTPUT VARIABLE						<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">6</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">8</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">8</div>						
1.	NAME, COST (Mngt) - Production Control											
2.	DEFINITION. Cost of managing the material supply and processing activities of the enterprise during a given period											
3.	UNITS, £ per period											
4.	FUNCTION.											
	1	Product Design	6	Finance	✓							
	2	Production Plan'g	7	Personnel								
	3	" Control	8	Secretarial		6					8 = £ RATE	
	4	Purchasing	9	Gen. Mngt.								
	5	Marketing										
5.	LIMITATION.											
	1											
	2											
	3											
6.	INDUCTION.											
	1	Cost (Prod) - Indirect Total	↑ ↑			0	6	8	2	4	1	0
	2											
	3											
	4											
	5											
7.	CONTROL PLAN, OR AIM.											
	Budget											
8.	NOTES											

OUTPUT VARIABLE										0	6	8	0	9
1.	NAME. COST (Mngt) - Purchasing													
2.	DEFINITION. Cost of managing the Purchasing activities of the enterprise during a given period													
3.	UNITS. £ per period													
4.	FUNCTION.													
	1	Product Design		6	Finance	✓								
	2	Production Plan'g		7	Personnel									
	3	" Control		8	Secretarial			6	8	= £	RATE			
	4	Purchasing		9	Gen. Mngt.									
	5	Marketing												
5.	LIMITATION.													
	1													
	2													
	3													
6.	INDUCTION.													
	1	Cost (Prod) - Indirect total				↑ ↑	0	6	8	2	4	1	0	
	2													
	3													
	4													
	5													
7.	CONTROL PLAN, OR AIM.													
	Budget													
8.	NOTES													

OUTPUT VARIABLE						<div style="display: flex; justify-content: space-around; border: 1px solid black; width: 100%;"> 06810 </div>						
1.	NAME. Cost (Mngt) - Marketing											
2.	DEFINITION. The cost of running the Marketing activities of an enterprise, per period											
3.	UNITS. i per period											
4.	FUNCTION,											
	1	Product Design	6	Finance								
	2	Production Plan's	7	Personnel								
	3	" Control	8	Secretarial		6	8	=	F	RATE		
	4	Purchasing	9	Gen. Mngt.								
	5	Marketing										
5.	LIMITATION.											
	1											
	2											
	3											
6.	INDUCTION.											
	1	Cost (Prod) - Indirect Total				0	6	8	2	4	1	0
	2											
	3											
	4											
	5											
7.	CONTROL PLAN, OR AIM,											
	Budget											
8.	NOTES											

OUTPUT VARIABLE										<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">6</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">8</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">1</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">1</div>					
1.	NAME, Cost (Mngt) - Financial														
2.	DEFINITION, The cost of running the Financial function of an enterprise per period														
3.	UNITS, £ per period														
4.	FUNCTION.														
	1	Product Design		6	Finance	✓									
	2	Production Plan'g		7	Personnel										
	3	" Control		8	Secretarial			6	8	£ RATE					
	4	Purchasing		9	Gen. Mngt.										
	5	Marketing													
5.	LIMITATION.														
	1														
	2														
	3														
6.	INDUCTION.														
	1	Cost (Prod) - Indirect Total				↑	0	6	8	2	4	1	0		
	2														
	3														
	4														
	5														
7.	CONTROL PLAN, OR AIM.														
	Budget														
8.	NOTES														

OUTPUT VARIABLE		0 6 8 1 3				
1.	NAME, Cost (Mngt) - Secretarial					
2.	DEFINITION, The cost of running the secretarial function of an enterprise per period					
3.	UNITS, £ per period					
4.	FUNCTION,					
1	Product Design	6	Finance	✓		
2	Production Plan'g	7	Personnel			
3	" Control	8	Secretarial		6	8 = 5 RATE
4	Purchasing	9	Gen. Mngt.			
5	Marketing					
5.	LIMITATION,					
1						
2						
3						
6.	INDUCTION,					
1	Cost (Prod) - Indirect total	↑ ↑	0	6	8	2 4 1 0
2						
3						
4						
5						
7.	CONTROL PLAN, OR AIM,					
	Budget					
8.	NOTES					

OUTPUT VARIABLE										<div style="display: flex; justify-content: space-around; border: 1px solid black; width: 100px;"> 06814 </div>					
1.	NAME, Cost (Mngt) - General														
2.	DEFINITION, The cost of running the General Management function of an enterprise per period														
3.	UNITS, £ per period														
4.	FUNCTION,														
	1	Product Design		6	Finance										
	2	Production Plan'g		7	Personnel										
	3	" Control		8	Secretarial		6	8	= £	RATE					
	4	Purchasing		9	Gen. Mngt.										
	5	Marketing													
5.	LIMITATION,														
	1														
	2														
	3														
6.	INDUCTION,														
	1	Cost (Prod) - Indirect Total				↑ ↑	0	6	8	2	4	1	0		
	2														
	3														
	4														
	5														
7.	CONTROL PLAN, OR AIM,														
	Budget														
8.	NOTES														

OUTPUT VARIABLE						<div style="display: flex; justify-content: space-around; border: 1px solid black; width: 100%;"> 06816 </div>						
1.	NAME. Cost (Prod) - Direct Labour (Components)											
2.	DEFINITION. The expenditure incurred in paying those who actually work on components for products, per unit of product produced.											
3.	UNITS. <div style="text-align: center; margin-top: 10px;">£ per unit</div>											
4.	FUNCTION.											
	1	Product Design	6	Finance								
	2	Production Plan'g	7	Personnel								
	3	" Control	8	Secretarial		6						
	4	Purchasing	9	Gen. Mngt.								
	5	Marketing										
5.	LIMITATION.											
	1											
	2											
	3											
6.	INDUCTION.											
	1	Cost (Prod) - Direct Total			↑ :	0	6	8	1	9	1	0
	2											
	3											
	4											
	5											
7.	CONTROL PLAN, OR AIM.											
	Budget											
8.	NOTES											

OUTPUT VARIABLE						<div style="display: flex; justify-content: space-around; border: 1px solid black; width: 100%;"> 06817 </div>																																																											
1.	NAME. Cost (Prod) - Direct Material (Components)																																																																
2.	DEFINITION. The expenditure incurred in acquiring the materials actually used to make products per unit of product produced.																																																																
3.	UNITS. £ per unit																																																																
4.	FUNCTION. <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 35%;">Product Design</td> <td style="width: 5%; text-align: center;">6</td> <td style="width: 35%;">Finance</td> <td style="width: 10%; text-align: center;">✓</td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> </tr> <tr> <td style="text-align: center;">2</td> <td>Production Plan's</td> <td style="text-align: center;">7</td> <td>Personnel</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">3</td> <td>" Control</td> <td style="text-align: center;">8</td> <td>Secretarial</td> <td></td> <td style="text-align: center;">6</td> <td colspan="5" style="text-align: center;">8 = £ RATE</td> </tr> <tr> <td style="text-align: center;">4</td> <td>Purchasing</td> <td style="text-align: center;">9</td> <td>Gen. Mngt.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">5</td> <td>Marketing</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>										1	Product Design	6	Finance	✓							2	Production Plan's	7	Personnel								3	" Control	8	Secretarial		6	8 = £ RATE					4	Purchasing	9	Gen. Mngt.								5	Marketing									
1	Product Design	6	Finance	✓																																																													
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4	Purchasing	9	Gen. Mngt.																																																														
5	Marketing																																																																
5.	LIMITATION. <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr><td style="width: 5%; text-align: center;">1</td><td style="width: 60%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td></tr> <tr><td style="text-align: center;">2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>										1											2											3																																
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7.	CONTROL PLAN, OR AIM, <div style="border: 1px solid black; height: 40px; margin-top: 10px; display: flex; align-items: center; justify-content: center; padding: 10px;"> Budget </div>																																																																
8.	NOTES																																																																

OUTPUT VARIABLE		0 6 8 1 8										
1.	NAME, Cost (Prod) - Direct labour (Assembly)											
2.	DEFINITION, The expenditure incurred in paying those who assemble the company's products, per unit of product produced.											
3.	UNITS, £ per unit											
4.	FUNCTION,											
	1	Product Design	6	Finance								
	2	Production Plan'g	7	Personnel								
	3	" Control	8	Secretarial		6	8	=	RATE			
	4	Purchasing	9	Gen. Mngt.								
	5	Marketing										
5.	LIMITATION,											
	1											
	2											
	3											
6.	INDUCTION,											
	1	Cost (Prod) - Direct Total			↑ ↑	0	6	8	1	9	1	0
	2											
	3											
	4											
	5											
7.	CONTROL PLAN, OR AIM,											
	Budget											
8.	NOTES											

OUTPUT VARIABLE		0 6 8 1 9											
1.	NAME. Cost (prod) - Direct Total												
2.	DEFINITION. Expenditure which can be identified with and assessed against a particular product or part.												
3.	UNITS. £ per unit of product												
4.	FUNCTION.												
	1	Product Design		6	Finance	✓							
	2	Production Plan'g		7	Personnel								
	3	" Control		8	Secretarial		6	8	= £	RATE			
	4	Purchasing		9	Gen. Mngt.								
	5	Marketing											
5.	LIMITATION.												
	1												
	2												
	3												
6.	INDUCTION.												
	1	Profit					0	6	8	0	3	2	0
	2												
	3												
	4												
	5												
7.	CONTROL PLAN, OR AIM.												
	Standard Cost												
8.	NOTES Includes direct material, direct labour and direct expense.												

OUTPUT VARIABLE										
1.	NAME, Cost (Prod) - Indirect (Handling & Storage)					0 6 8 2 0				
2.	DEFINITION. The cost of materials handling and storage in a given period of time.									
3.	UNITS. £ per period									
4.	FUNCTION.									
	1	Product Design	6	Finance	✓					
	2	Production Plan'g	7	Personnel						
	3	" Control	8	Secretarial		6	8	=	£	RATE
	4	Purchasing	9	Gen. Mngt.						
	5	Marketing								
5.	LIMITATION.									
	1									
	2									
	3									
6.	INDUCTION.									
	1	Cost (Prod) - Indirect total				+	+	0	6	8
	2									
	3									
	4									
	5									
7.	CONTROL PLAN, OR AIM.									
	Budget									
8.	NOTES									

OUTPUT VARIABLE		0 6 8 2 1											
1.	NAME. Cost (Prod) - Indirect (Maintenance)												
2.	DEFINITION, The cost of plant maintenance in a given period of time.												
3.	UNITS. i per period												
4.	FUNCTION.												
	1	Product Design		6	Finance	✓							
	2	Production Plan'g		7	Personnel								
	3	" Control		8	Secretarial		6	8	= f	RATE			
	4	Purchasing		9	Gen. Mngt.								
	5	Marketing											
5.	LIMITATION.												
	1												
	2												
	3												
6.	INDUCTION.												
	1	Cost (Prod) - Indirect total				↑ ↑	0	6	8	2	4	1	0
	2												
	3												
	4												
	5												
7.	CONTROL PLAN, OR AIM.												
	Maintenance budget												
8.	NOTES Maintenance includes "Preventive maintenance", Adjustment, Repair, Oiling and greasing, and Overhaul.												

OUTPUT VARIABLE		0 6 8 2 2																																																	
1.	NAME. Cost (Prod) - Indirect (Quality Control)																																																		
2.	DEFINITION. The cost of Quality Control in a given period of time.																																																		
3.	UNITS. £ per period																																																		
4.	<div style="display: flex; align-items: flex-start;"> <div style="flex: 1;"> <p>FUNCTION.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;">1</td> <td style="width: 40%;">Product Design</td> <td style="width: 5%;">6</td> <td style="width: 40%;">Finance</td> </tr> <tr> <td>2</td> <td>Production Plan's</td> <td>7</td> <td>Personnel</td> </tr> <tr> <td>3</td> <td>" Control</td> <td>8</td> <td>Secretarial</td> </tr> <tr> <td>4</td> <td>Purchasing</td> <td>9</td> <td>Gen. Mngt.</td> </tr> <tr> <td>5</td> <td>Marketing</td> <td></td> <td></td> </tr> </table> </div> <div style="flex: 1; text-align: center;">  <div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">6</div> 8 = £ RATE </div> </div>	1	Product Design	6	Finance	2	Production Plan's	7	Personnel	3	" Control	8	Secretarial	4	Purchasing	9	Gen. Mngt.	5	Marketing																																
1	Product Design	6	Finance																																																
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3	" Control	8	Secretarial																																																
4	Purchasing	9	Gen. Mngt.																																																
5	Marketing																																																		
5.	<p>LIMITATION.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 5%;">1</td><td style="width: 95%;"></td></tr> <tr><td>2</td><td></td></tr> <tr><td>3</td><td></td></tr> </table>	1		2		3																																													
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6.	<p>INDUCTION.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;">1</td> <td style="width: 60%;">Cost (Prod) - Indirect Total</td> <td style="width: 5%;">↑ ↑</td> <td style="width: 5%;">0</td> <td style="width: 5%;">6</td> <td style="width: 5%;">8</td> <td style="width: 5%;">2</td> <td style="width: 5%;">4</td> <td style="width: 5%;">1</td> <td style="width: 5%;">0</td> </tr> <tr><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>	1	Cost (Prod) - Indirect Total	↑ ↑	0	6	8	2	4	1	0	2										3										4										5									
1	Cost (Prod) - Indirect Total	↑ ↑	0	6	8	2	4	1	0																																										
2																																																			
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4																																																			
5																																																			
7.	<p>CONTROL PLAN, OR AIM.</p> <p style="text-align: center;">Budget</p>																																																		
8.	<p>NOTES</p> <p>Quality Control includes " Inspection"</p>																																																		

OUTPUT VARIABLE						<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">6</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">8</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">2</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">3</div>							
1.	NAME, Cost (Prod) - Indirect (Setting)												
2.	DEFINITION, The cost of machine setting-up per period												
3.	UNITS, £ per period												
4.	FUNCTION,												
	1	Product Design	6	Finance	✓								
	2	Production Plan's	7	Personnel									
	3	" Control	8	Secretarial		6					8 = £ RATE		
	4	Purchasing	9	Gen. Mngt.									
	5	Marketing											
5.	LIMITATION,												
	1												
	2												
	3												
6.	INDUCTION,												
	1	Cost (Prod) - Indirect total				↑ ↑	0	6	8	2	4	1	0
	2												
	3												
	4												
	5												
7.	CONTROL PLAN, OR AIM,												
	Budget												
8.	NOTES												
	Set-up includes "tear-down"												

OUTPUT VARIABLE		0 6 8 2 4				
1.	NAME, Cost (Prod) - Indirect total					
2.	DEFINITION, The total of all indirect costs in a particular period of time.					
3.	UNITS, £ per period					
4.	FUNCTION,					
1	Product Design	6	Finance	✓		
2	Production Plan'g	7	Personnel			
3	" Control	8	Secretarial		6	8 = £ RATE
4	Purchasing	9	Gen. Mngt.			
5	Marketing					
5.	LIMITATION,					
1						
2						
3						
6.	INDUCTION,					
1	Cost (Prod) - Total	↑↑	0	6	8	2 5 1 0
2						
3						
4						
5						
7.	CONTROL PLAN, OR AIM,					
	Budget					
8.	NOTES					

OUTPUT VARIABLE				0 6 8 2 5					
1.	NAME, Cost (Prod) - Total								
2.	DEFINITION, The total of all costs in a particular period of time.								
3.	UNITS, £ per period								
4.	FUNCTION.								
	1	Product Design	6	Finance	✓				
	2	Production Plan'g	7	Personnel					
	3	" Control	8	Secretarial		6	8	= £ RATE	
	4	Purchasing	9	Gen. Mngt.					
	5	Marketing							
5.	LIMITATION.								
	1								
	2								
	3								
6.	INDUCTION.								
	1	Profit	↑ ↓		0	6	8	0	3
	2								
	3								
	4								
	5								
7.	CONTROL PLAN, OR AIM.								
	Budget								
8.	NOTES								
	Total costs include all Direct costs, plus all indirect costs.								

OUTPUT VARIABLE										
1.	NAME, Customer's Servicing Costs					0 6 8 2 6				
2.	DEFINITION, The costs incurred by customers in servicing the Company's products.									
3.	UNITS, 1 per period									
4.	FUNCTION,									
	1	Product Design	6	Finance						
	2	Production Plan's	7	Personnel						
	3	" Control	8	Secretarial		6	8	=	RATE	
	4	Purchasing	9	Gen. Mngt.						
	5	Marketing								
5.	LIMITATION,									
	1									
	2									
	3									
6.	INDUCTION,									
	1									
	2									
	3									
	4									
	5									
7.	CONTROL PLAN, OR AIM,									
8.	NOTES Not a part of Company costs.									

OUTPUT VARIABLE						<div style="display: flex; justify-content: space-around; border: 1px solid black; width: 100%;"> 07301 </div>																																																											
1.	NAME. <div style="text-align: center; margin-top: 10px;">WORKING HOURS</div>																																																																
2.	DEFINITION. The number of hours worked per week by those employed in a factory																																																																
3.	UNITS. <div style="text-align: center; margin-top: 10px;">Hours per week</div>																																																																
4.	FUNCTION. <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 35%;">Product Design</td> <td style="width: 5%; text-align: center;">6</td> <td style="width: 35%;">Finance</td> <td style="width: 10%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> </tr> <tr> <td style="text-align: center;">2</td> <td>Production Plan'g</td> <td style="text-align: center;">7</td> <td>Personnel</td> <td style="text-align: center;">✓</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">3</td> <td>" Control</td> <td style="text-align: center;">8</td> <td>Secretarial</td> <td></td> <td style="text-align: center; border: 2px solid black;">7</td> <td style="text-align: center;">3</td> <td colspan="4" style="text-align: center;">= TIME</td> </tr> <tr> <td style="text-align: center;">4</td> <td>Purchasing</td> <td style="text-align: center;">9</td> <td>Gen. Mngt.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">5</td> <td>Marketing</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>										1	Product Design	6	Finance								2	Production Plan'g	7	Personnel	✓							3	" Control	8	Secretarial		7	3	= TIME				4	Purchasing	9	Gen. Mngt.								5	Marketing									
1	Product Design	6	Finance																																																														
2	Production Plan'g	7	Personnel	✓																																																													
3	" Control	8	Secretarial		7	3	= TIME																																																										
4	Purchasing	9	Gen. Mngt.																																																														
5	Marketing																																																																
5.	LIMITATION. <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr><td style="width: 5%; text-align: center;">1</td><td style="width: 60%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td><td style="width: 5%;"></td></tr> <tr><td style="text-align: center;">2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>										1											2											3																																
1																																																																	
2																																																																	
3																																																																	
6.	INDUCTION. <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 45%;">Capacity - factory</td> <td style="width: 10%; text-align: center;">↑ ↑</td> <td style="width: 5%; text-align: center;">0</td> <td style="width: 5%; text-align: center;">3</td> <td style="width: 5%; text-align: center;">2</td> <td style="width: 5%; text-align: center;">0</td> <td style="width: 5%; text-align: center;">5</td> <td style="width: 5%; text-align: center;">1</td> <td style="width: 5%; text-align: center;">0</td> </tr> <tr><td style="text-align: center;">2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>										1	Capacity - factory	↑ ↑	0	3	2	0	5	1	0	2										3										4										5														
1	Capacity - factory	↑ ↑	0	3	2	0	5	1	0																																																								
2																																																																	
3																																																																	
4																																																																	
5																																																																	
7.	CONTROL PLAN, OR AIM. <div style="text-align: center; margin-top: 10px;">Planned working hours</div>																																																																
8.	NOTES																																																																

OUTPUT VARIABLE						<div style="display: flex; justify-content: space-around; border: 1px solid black; width: 100%;"> 07302 </div>					
1.	NAME, ABSENTEEISM										
2.	DEFINITION, Hours lost due to workers absence from work in a particular period of time.										
3.	UNITS, Hours or mins per period										
4.	FUNCTION,										
	1	Product Design	6	Finance		7					
	2	Production Planning	7	Personnel	✓	7	3	= TIME			
	3	" Control	8	Secretarial		7	3	= TIME			
	4	Purchasing	9	Gen. Mngt.							
	5	Marketing									
5.	LIMITATION,										
	1										
	2										
	3										
6.	INDUCTION,										
	1	Working hours	↑ ↓		0	7	3	0	1	2	0
	2	Idle time - no operator	↑ ↑		0	3	3	0	9	1	0
	3										
	4										
	5										
7.	CONTROL PLAN, OR AIM,										
	Planned working hours										
8.	NOTES										

OUTPUT VARIABLE						<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">7</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">3</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">3</div>					
1.	NAME, LATE NESS										
2.	DEFINITION, Hours lost due to workers arriving late for work in a particular period of time.										
3.	UNITS, Hours, or mins per period										
4.	FUNCTION,										
	1	Product Design	6	Finance							
	2	Production Plan'g	7	Personnel	✓						
	3	" Control	8	Secretarial		7	3	= TIME			
	4	Purchasing	9	Gen. Mngt.							
	5	Marketing									
5.	LIMITATION,										
	1										
	2										
	3										
6.	INDUCTION,										
	1	Capacity - work centre	↑ ↓		0	3	2	0	8	2	0
	2	Idle time- no operator	↑ ↑		0	3	3	0	9	1	0
	3										
	4										
	5										
7.	CONTROL PLAN, OR AIM,										
	Planned working hours										
8.	NOTES										

OUTPUT VARIABLE						0	7	4
TYPE,		PERSONNEL (7)				QTY STATE (4)		
CODE,					DESCRIPTION.			
0	7	4	0	1	Employees			
			0	2				

OUTPUT VARIABLE				0 7 4 0 1					
1.	NAME, EMPLOYEES								
2.	DEFINITION, The total number of people employed at a particular moment in time								
3.	UNITS, People								
4.	FUNCTION.								
	1	Product Design	6	Finance					
	2	Production Plan's	7	Personnel	✓				
	3	" Control	8	Secretarial		7	4	=	Qty state
	4	Purchasing	9	Gen. Mngt.					
	5	Marketing							
5.	LIMITATION.								
	1								
	2								
	3								
6.	INDUCTION.								
	1	Expenditure	↑ ↑		0	6	8	0	2 1 0
	2	Productivity	↑ ↓		0	9	9	0	5 2 0
	3								
	4								
	5								
7.	CONTROL PLAN, OR AIM.								
	Labour Budget								
8.	NOTES								

OUTPUT VARIABLE					0	7	5
TYPE, PERSONNEL (7)					QTY RATE (5)		
CODE,					DESCRIPTION,		
0	7	5	0	1	Labour Turnover		

OUTPUT VARIABLE										0	7	5	0	1
1.	NAME. LABOUR TURNOVER													
2.	DEFINITION. The number of people leaving the employment of a company, who are replaced by new entrants, in a given period of time													
3.	UNITS. People, per period													
4.	FUNCTION.													
	1	Product Design		6	Finance									
	2	Production Plan'g		7	Personnel									
	3	" Control		8	Secretarial									
	4	Purchasing		9	Gen. Mngt.									
	5	Marketing												
5.	LIMITATION.													
	1													
	2													
	3													
6.	INDUCTION.													
	1	Production					0	3	5	0	1	2	0	
	2	Cost -Total					0	6	8	2	5	1	0	
	3													
	4													
	5													
7.	CONTROL PLAN, OR AIM.													
	Labour Budget													
8.	NOTES													

OUTPUT VARIABLE					0	7	7
TYPE, PERSONNEL (7)					PSY.SOC (7)		
CODE,					DESCRIPTION.		
0	7	7	0	1	Job Satisfaction		
			0	2	Motivation		
			0	3	Job Enrichment		
			0	4			
			0	5			

OUTPUT VARIABLE				<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">7</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">7</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">3</div>					
1.	NAME, JOB ENRICHMENT								
2.	DEFINITION. The addition of further tasks to a boring, repetitive job to make it more challenging and satisfying								
3.	UNITS. ?								
4.	FUNCTION.								
	1	Product Design	6	Finance					
	2	Production Plan'g	7	Personnel					
	3	" Control	8	Secretarial		7	7 = Psysoc		
	4	Purchasing	9	Gen. Mngt.					
	5	Marketing							
5.	LIMITATION.								
	1								
	2								
	3								
6.	INDUCTION.								
	1	Job Satisfaction	↑ ↑	0	7	7	0	1	1
	2								
	3								
	4								
	5								
7.	CONTROL PLAN, OR AIM.								
	?								
8.	NOTES								
	Job enrichment is partly a function of operation time and partly of the amount of delegated decision making.								

OUTPUT VARIABLE										<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">7</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">8</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">1</div>									
1.	NAME, TAKE HOME PAY																		
2.	DEFINITION. The total money taken home by an employee after deducting any taxes, contributions, or other deductions, per day period																		
3.	UNITS, £ per period																		
4.	FUNCTION.																		
	1	Product Design				6	Finance												
	2	Production Plan's				7	Personnel				✓								
	3	" Control				8	Secretarial					7	8	= £ RATE					
	4	Purchasing				9	Gen. Mngt.												
	5	Marketing																	
5.	LIMITATION.																		
	1																		
	2																		
	3																		
6.	INDUCTION.																		
	1	Job Satisfaction										↑ ↑	0	7	7	0	1	1	0
	2	Cost - total										↑ ↑	0	6	8	2	5	1	0
	3																		
	4																		
	5																		
7.	CONTROL PLAN, OR AIM.																		
	Budget																		
8.	NOTES																		

OUTPUT VARIABLES					0	9	9
TYPE, GENERAL MANAGEMENT (9)					CHARACTERISTICS SYSTEM PERFORM (9)		
CODE,					DESCRIPTION.		
0	9	9	0	1	Flexibility		
			0	2	Controllability		
			0	3	Reliability		
			0	4	Sensitivity		
			0	5	Productivity		
			0	6	Profitability		
			0	7	Complexity - of MH flow system		

OUTPUT VARIABLE																																																											
1.	NAME,	FLEXIBILITY																																																									
2.	DEFINITION,	The ability to follow market changes rapidly and at low cost																																																									
3.	UNITS,	?																																																									
4.	FUNCTION,	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 5%;">1</td> <td style="width: 35%;">Product Design</td> <td style="width: 5%;">6</td> <td style="width: 35%;">Finance</td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> </tr> <tr> <td>2</td> <td>Production Plan's</td> <td>7</td> <td>Personnel</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>" Control</td> <td>8</td> <td>Secretarial</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>Purchasing</td> <td>9</td> <td>Gen. Mngt.</td> <td>✓</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td>Marketing</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>								1	Product Design	6	Finance							2	Production Plan's	7	Personnel							3	" Control	8	Secretarial							4	Purchasing	9	Gen. Mngt.	✓						5	Marketing								
1	Product Design	6	Finance																																																								
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3	" Control	8	Secretarial																																																								
4	Purchasing	9	Gen. Mngt.	✓																																																							
5	Marketing																																																										
5.	LIMITATION,	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>								1										2										3																													
1																																																											
2																																																											
3																																																											
6.	INDUCTION,	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 5%;">1</td> <td style="width: 45%;">Obsolescence</td> <td style="width: 10%;">11</td> <td style="width: 5%;">0</td> <td style="width: 5%;">6</td> <td style="width: 5%;">6</td> <td style="width: 5%;">1</td> <td style="width: 5%;">4</td> <td style="width: 5%;">2</td> <td style="width: 5%;">0</td> </tr> <tr><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>								1	Obsolescence	11	0	6	6	1	4	2	0	2										3										4										5									
1	Obsolescence	11	0	6	6	1	4	2	0																																																		
2																																																											
3																																																											
4																																																											
5																																																											
7.	CONTROL PLAN, OR AIM,																																																										
8.	NOTES																																																										

OUTPUT VARIABLE		<div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">0 9 9 0 4</div>																																																											
1.	NAME. SENS IT IV ITY																																																												
2.	DEFINITION. The speed with which a change in Parameter value induces a change in a connectance variable																																																												
3.	UNITS. Time: Weeks, days, hours																																																												
4.	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 40%;">Product Design</td> <td style="width: 5%; text-align: center;">6</td> <td style="width: 40%;">Finance</td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> </tr> <tr> <td style="text-align: center;">2</td> <td>Production Plan's</td> <td style="text-align: center;">7</td> <td>Personnel</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">3</td> <td>" Control</td> <td style="text-align: center;">8</td> <td>Secretarial</td> <td></td> <td style="text-align: center;">9</td> <td style="text-align: center;">9</td> <td>=</td> <td>Syst</td> <td>Perf</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">4</td> <td>Purchasing</td> <td style="text-align: center;">9</td> <td>Gen. Mngt.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">5</td> <td>Marketing</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	1	Product Design	6	Finance									2	Production Plan's	7	Personnel									3	" Control	8	Secretarial		9	9	=	Syst	Perf			4	Purchasing	9	Gen. Mngt.									5	Marketing										
1	Product Design	6	Finance																																																										
2	Production Plan's	7	Personnel																																																										
3	" Control	8	Secretarial		9	9	=	Syst	Perf																																																				
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5.	LIMITATION.																																																												
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6.	INDUCTION.																																																												
1	Controlability 1 1 0 9 9 0 2 1 0																																																												
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4																																																													
5																																																													
7.	CONTROL PLAN, OR AIM,																																																												
8.	NOTES																																																												

OUTPUT VARIABLE										<div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">9</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">9</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">2</div>					
1.	NAME, CONTROLABILITY														
2.	DEFINITION. The accuracy with which a Manager can follow a required set of Aims.														
3.	UNITS. ?														
4.	FUNCTION.														
	1	Product Design		6	Finance										
	2	Production Plan'g		7	Personnel										
	3	" Control		8	Secretarial				9	9 = Syst Perf					
	4	Purchasing		9	Gen. Mngt.	✓									
	5	Marketing													
5.	LIMITATION.														
	1														
	2														
	3														
6.	INDUCTION.														
	1	Flexibility						0	9	9	0	1	1	0	
	2														
	3														
	4														
	5														
7.	CONTROL PLAN, OR AIM.														
8.	NOTES														

OUTPUT VARIABLE										0	9	9	0	5
1.	NAME, P R O D U C T I V I T Y													
2.	DEFINITION. Production output per employee													
3.	UNITS. Products per person													
4.	FUNCTION.													
	1	Product Design		6	Finance									
	2	Production Plan'g		7	Personnel									
	3	" Control		8	Secretarial				9	9 = Syst Perf				
	4	Purchasing		9	Gen. Mngt.									
	5	Marketing												
5.	LIMITATION.													
	1													
	2													
	3													
6.	INDUCTION.													
	1	Profitability					0	9	9	0	6	1	0	
	2													
	3													
	4													
	5													
7.	CONTROL PLAN, OR AIM.													
	Budget													
8.	NOTES													

OUTPUT VARIABLE		<div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">0</div> <div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">9</div> <div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">9</div> <div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">0</div> <div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">6</div>				
1.	NAME, <div style="text-align: center; margin-top: 10px;">P R O F I T A B I L I T Y</div>					
2.	DEFINITION, The ^{rate} route of return of Profit on Investment					
3.	UNITS, <div style="text-align: center; margin-top: 10px;">1 per f</div>					
4.	FUNCTION,					
	1	Product Design	6	Finance		
	2	Production Plan'g	7	Personnel		
	3	" Control	8	Secretarial	9	9 - Syst Perf
	4	Purchasing	9	Gen. Mngt.		
	5	Marketing				
5.	LIMITATION,					
	1					
	2					
	3					
6.	INDUCTION,					
	1					
	2					
	3					
	4					
	5					
7.	CONTROL PLAN, OR AIM,					
	Budget					
8.	NOTES					

CHAPTER 7. THROUGHPUT TIME

1. INTRODUCTION

This chapter considers the Production System variable called "Throughput time", why it is important; how it can be measured, and the ways in which it can be reduced. The analysis is based as an example, on the Production System Variable Connectance model.

2. WHAT IS THROUGHPUT TIME?

Throughput time (03301) is the time taken by a specified quantity of material, to pass through a factory. The specified quantity is one unit, unless otherwise stated but may be a batch of material or a machining batch if required.

The term Throughput time, if suitably qualified, can also be used to define the time taken by materials to pass through any particular segment of the material flow system, e.g., Component processing throughput time, between Material and Finished Parts stores.

The nature of Throughput time is illustrated in Fig.7.1, using stock charts, which show the variation of the stock value of a batch of material with time for three successive processing stages. This illustration oversimplifies the problem. It does not show how delays in processing either the part in question or other parts used in sets with it for assembly, will increase the throughput time.

3. HOW TO MEASURE THROUGHPUT TIME

In order to measure the average throughput time of a particular part number, one must:

1. Take a representative sample of the material when it arrives in the factory.
2. Mark, or label these items to show the date and time of arrival.
3. Note the serial numbers of the products in which each item in the sample is included after processing.
4. Note the date and time when each of these products leaves the factory.

In order to measure the average throughput time for all components the above measures, must be repeated for a representative sample of different part numbers.

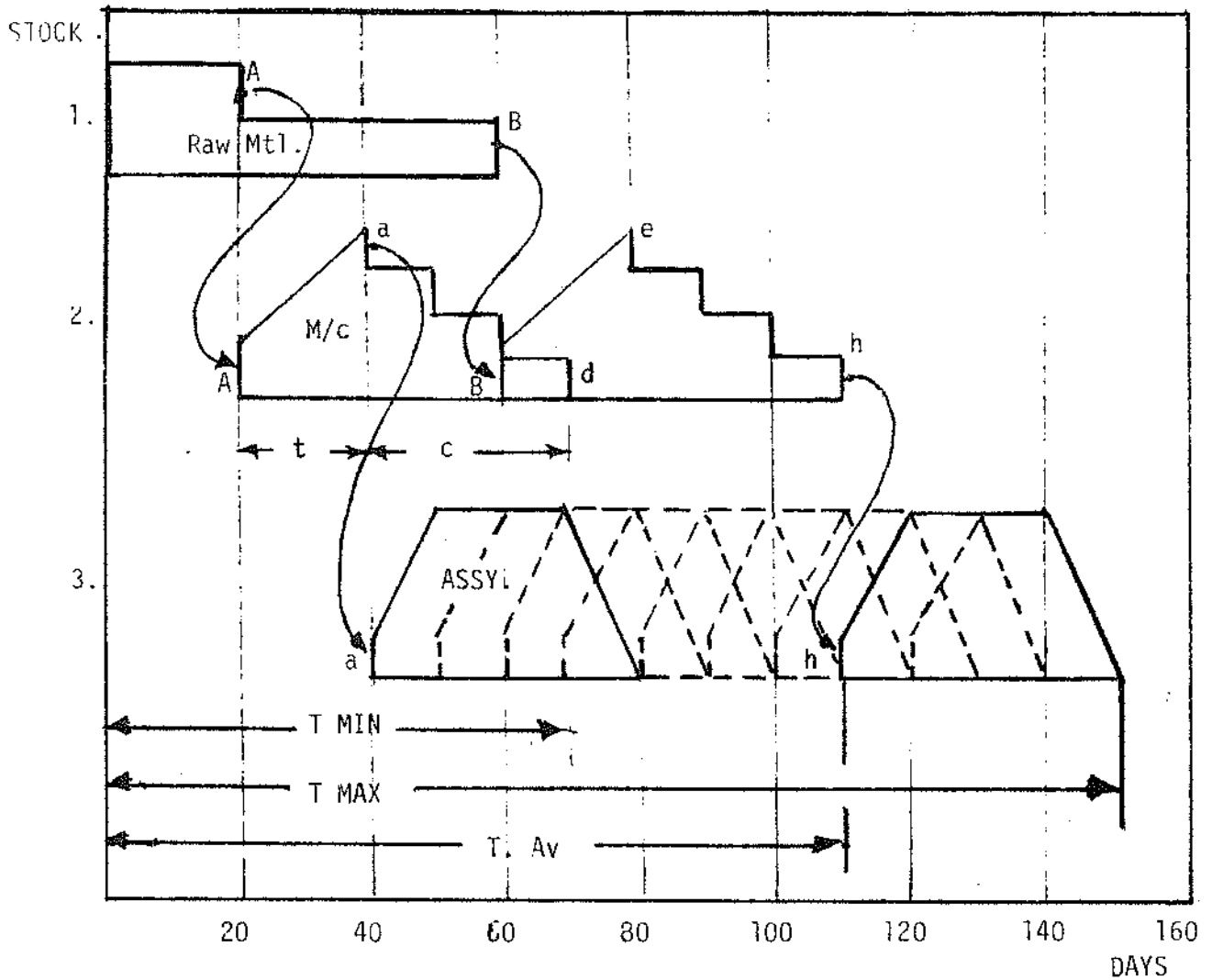
It is much simpler to measure the "Component processing throughput time", where it is only necessary to record the time when materials are issued from the "Material stores" and the time when the finished components arrive in the "Finished component stores". A complication arises however in relation to scrap. Normally a reasonable amount of scrap can be written off and replacement time need not be included in the throughput time.

It is also reasonably simple to measure the total throughput time of a batch using the logic illustrated in Fig.7.1.

4. THE IMPORTANCE OF THROUGHPUT TIME.

The main importance of throughput time is that as illustrated in Fig.7.2, a reduction in its value reduces Stocks. This in turn as shown by the Production System connectance model reduces the investment in stocks and W.I.P.; the cost of holding stocks and further reduces the throughput times. See Fig.7.3. The net result is an increase in profitability, or return on investment.

In the case of products which are made to order reducing the throughput time also reduces the customer service time. This relationship is not always true



T_{MIN} = THROUGHPUT TIME - Minimum
 T_{MAX} = " " - Maximum
 T_{AV} = " " - Average
 t = Component batch - throughput time
 c = " " - consumption time.

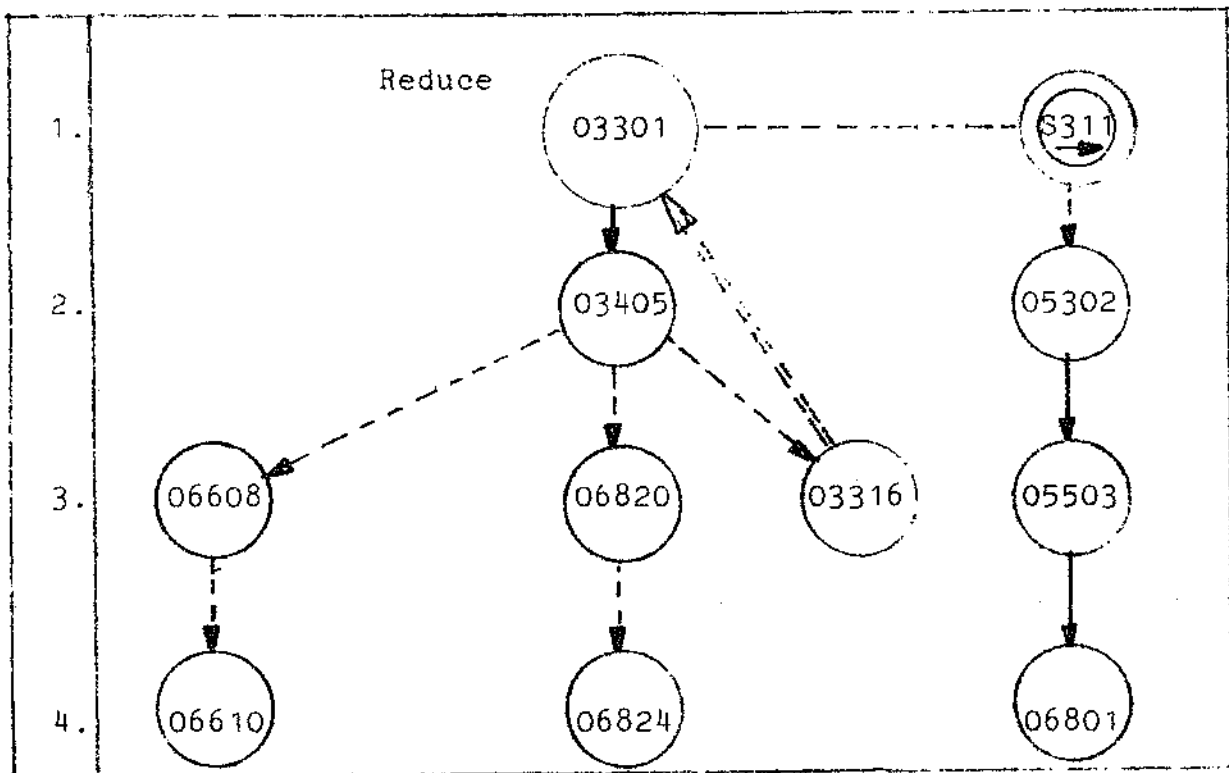
NOTE 4 Assy batches per machining batch. 2 m/c batches per Raw Material batch.

FIG.7.1. THROUGHPUT TIME.

OUTPUT VARIABLE				<div style="display: inline-block; border: 1px solid black; padding: 2px 5px; margin: 0 2px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px; margin: 0 2px;">3</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px; margin: 0 2px;">3</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px; margin: 0 2px;">0</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px; margin: 0 2px;">1</div>																														
1.	NAME. THROUGHPUT TIME																																	
2.	DEFINITION. The time taken by one unit of material to pass through a factory, or through a specified portion of its material flow system.																																	
3.	UNITS. Time: weeks, days, hours.																																	
4.	<div style="display: flex; justify-content: space-between;"> <div style="width: 60%;"> <p>FUNCTION.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 35%;">Product Design</td> <td style="width: 5%;"></td> <td style="width: 5%; text-align: center;">6</td> <td style="width: 35%;">Finance</td> </tr> <tr> <td style="text-align: center;">2</td> <td>Production Plan's</td> <td></td> <td style="text-align: center;">7</td> <td>Personnel</td> </tr> <tr> <td style="text-align: center;">3</td> <td>" Control</td> <td></td> <td style="text-align: center;">8</td> <td>Secretarial</td> </tr> <tr> <td style="text-align: center;">4</td> <td>Purchasing</td> <td></td> <td style="text-align: center;">9</td> <td>Gen. Mngt.</td> </tr> <tr> <td style="text-align: center;">5</td> <td>Marketing</td> <td></td> <td></td> <td></td> </tr> </table> </div> <div style="width: 35%; text-align: center;"> <div style="margin-bottom: 10px;">↑</div> <div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">3</div> 3 = Time </div> </div>									1	Product Design		6	Finance	2	Production Plan's		7	Personnel	3	" Control		8	Secretarial	4	Purchasing		9	Gen. Mngt.	5	Marketing			
1	Product Design		6	Finance																														
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4	Purchasing		9	Gen. Mngt.																														
5	Marketing																																	
5.	LIMITATION. L																																	
6.	INDUCTION. C																																	
1	Stocks - total ↑ ↑				0	3	4	0	5	1	0																							
2	Customers service time ↑ ↑				0	5	3	0	2	1	0																							
3	IF and only IF:				I	F																												
4	Make for stock or to order →				S	3	1	1	8	0																								
5																																		
7.	CONTROL PLAN, OR AIM.																																	
	Lead time - Manufacture																																	
8.	<p>NOTES</p> <p>Throughput time does not always affect sales delivery time, if products are made for stock.</p> <p>The term "throughput time" can also be used, if qualified, to cover particular segments of the material flow system</p> <p>e.g. "Component processing throughput time" covers the segment between Material & Finished part stores.</p>																																	

FIG.7.2 CLASSIFICATION SHEET FOR THROUGHPUT TIME

1. REDUCE 0 3301. THROUGHPUT TIME.
2. Reduces. 03405. Stocks Total.
3. Reduces. 06608. Investment - Stocks & W.I.P.
4. Reduces. 06610. Investment Total.
3. Reduces. 06820. Cost(handling & storage)
4. Reduces. 06824. Total Indirect cost.
3. Reduces. 03316. Storage time.
4. Reduces. 03301. Throughput time.
2. Reduces. 05302. Customer service time.
IF & ONLY IF
2nd Alt. S311. Make for stock or Make to order.
3. Increases. 05503. Sales total.
4. Increases. 06801. Revenue.



KEY.

→ = Increases.

- - - → = Reduces.

==> = Reduces(loop)

⊖ = IF & only IF.

FIG IMPORTANCE OF REDUCING THROUGHPUT TIME.

however, in the case of products which are made for stock.

Fig.7.4 uses stock charts to illustrate why reducing throughput time reduces the stock level. For simplicity the case is illustrated of an item for which there is an even rate of continuous demand.

5. HOW TO REDUCE THROUGHPUT TIME.

The "Production System Variable connectance model" was used to find what changes in other system variables would induce a reduction in throughput time.

In this model system variables are classified into four main type:

1. System design parameters. Variables expressed as a choice between alternatives, between which a Manager can make an arbitrary choice.
2. Regulatory parameters. Variables to which a Manager can assign arbitrary values from a range of values.
3. Output variables. Variables which a manager can only change indirectly by changing Parameter values.
4. Input variables. Variables which affect the System but over which the Manager has no control.

The relationship between the variables has been found by identifying, defining and studying over 200 variables and by recording their "connectance" with other variables, on classification sheets such as that illustrated in Fig.7.2.

The first order changes in other variables which will induce a reduction in Throughput time were found with the model in the form shown in Fig.7.5. The "connectance" indicated can be justified as follows:

A. System design parameters

- (1) S202. Process or Product layout. The choice of the 2nd alternative (Product layout) reduces T, because machines for succeeding operations are close together and are all under one foreman.
- (2) S203. Many or Few operations per part. The 2nd alternative reduces handling moves and waiting time.
- (3) S302. Multi or single cycle ordering. The change from 1st to 2nd alternative changes "component processing throughput time" from an "output variable" to a "parameter" and reduces it's value.
- (4) S310. One shift or more. The 2nd alternative increases the hours/day, reducing the elapsed time in days.

Note: System design parameter choice fixes Policies.

B. Regulatory parameters

- (1) Reduce P201. No. operations/part. Reducing this parameter reduces the number of handling moves and also reduces waiting time.
- (2) Reduce P303. Run quantity. The smaller the run quantity, the shorter the throughput time.
- (3) Reduce P305. Transfer quantity (TQ). Reducing T.Q to less than the Run quantity makes "close scheduling" possible, thus reducing throughput time. See Fig.7.6.
- (4) Reduce P309. Ordering period for single cycle ordering. The ordering

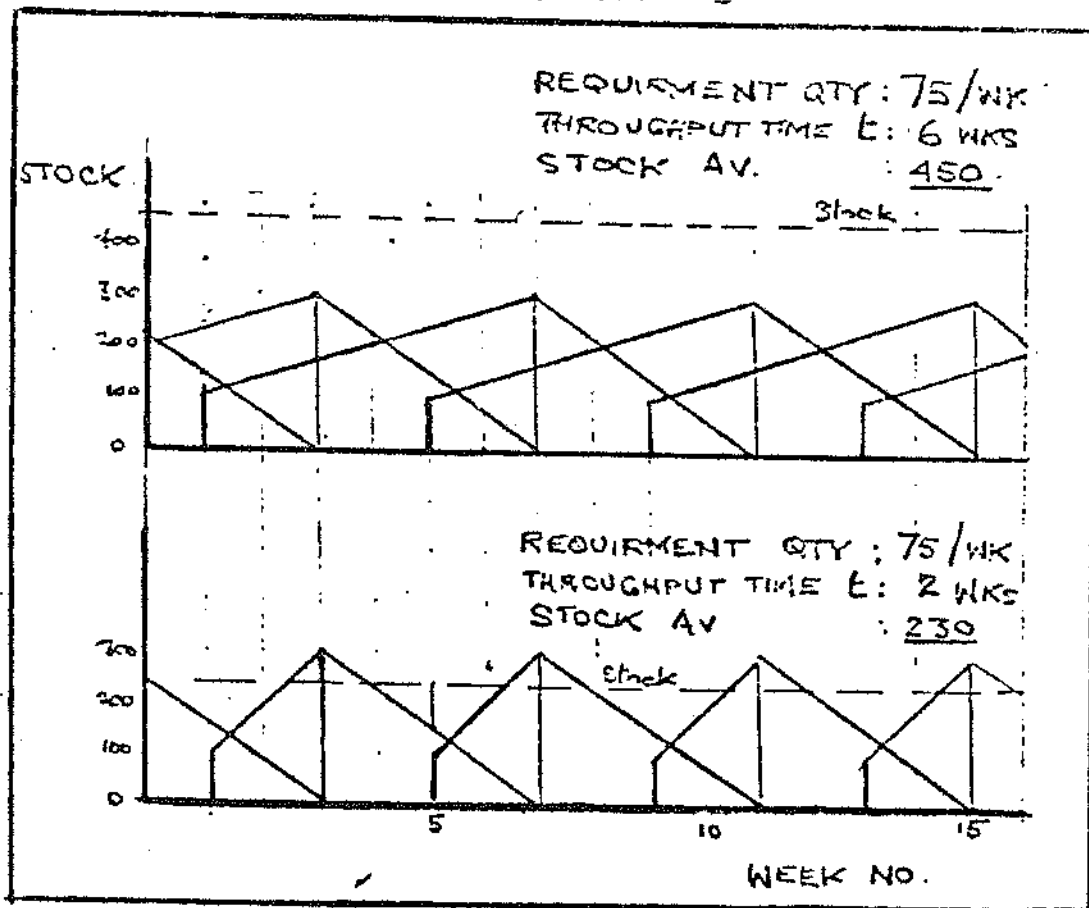


FIG 7.4 THROUGHPUT TIME & STOCKS.

To Reduce 03301. Throughput time.

2nd alt. S202. Process or Prod. Layout.
 " " S203. Many or Few Ops/Part.
 " " S302. Multi or Single cycle.
 " " S310. One shift or more
 Reduce P201. No. ops/part.
 " P303. Run quantity.
 " P305. Transfer quantity.
 " P309. Ordering period - single cycle ordering.
 Increase P316. Overtime.
 Reduce 03302. Set-up time/Op.
 " 03305. Op time/Part.
 " 03309. Idle time - No operator.
 " 03310. Idle time - wait help.
 " 03315. Waiting time.
 " 03316. Storage time.
 " 03406. Shortages.
 " 03407. Orders overdue.

FIG 7.5 FIRST ORDER CHANGES TO REDUCE THROUGHPUT TIME.

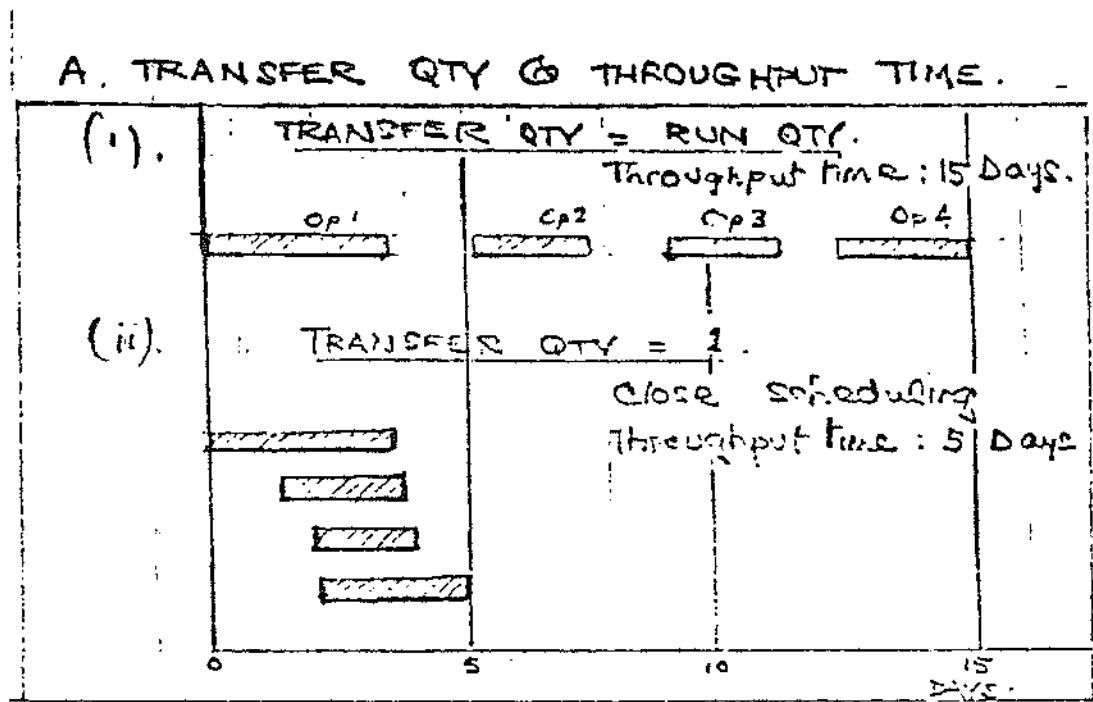


FIG.7.6. THROUGHPUT TIME & STOCKS

The following changes reduce THROUGHPUT TIME:

1. Reduce: 03302. Set-up time by:
 - 2nd Alt. S204. Individual tooling or Tool for families.
 - 2nd Alt. S205. Set-up on m/c, or Pre-setting.
 - 2nd Alt. S213. Tool for min.op, or min.op. + set.time.
 - 2nd Alt. S309. Schedule ops at random, or in tool families.
 - Increase P202. Tooling families per m/c.
 - " P203. Parts per tooling family.
 - " P307. Set-up quantity.
2. Reduce 03305. Op time/part by:
 - Increase P206. m/c speed.
 - " P207. m/c feed.
3. Reduce 03309. Idle time - No operator, by:
 - Reduce. 07302. Absenteeism.
 - " 07303. Lateness.
4. Reduce 03310. Idle time - wait help, by:
 - Increase P703. Training hours/employee.
5. Reduce 03315. Waiting time, by:-
 - 2nd Alt. S302. Multi or single cycle ordering.
6. Reduce 03316. Storage time by:-
 - Reduce 03405. Stocks total.

FIG.7.7. SECOND ORDER VARIABLES

period fixes the throughput time.

(5) Increase P316. Overtime. Increasing overtime increases the working hours per day, reducing the elapsed time in days.

Note: The model also shows that some of these desirable changes are subject to Limitations imposed by the values of other System design and regulatory parameters.

e.g. (i) 2nd alt. S302. Multi or single cycle, is only possible if we choose 2nd Alt. S301. Stock or Flow control.

(ii) P309. Ordering period is only applicable to: 2nd Alt. S302. Multi or Single cycle ordering.

(iii) 2nd Alt. S302. Process or Product Layout is only applicable to: 2nd Alt. S702. Process or Product organisation.

C. Output variables

- (1) O 3302. Set-up time/op
- O 3305. Operation time ea.
- O 3309. Idle time - no operator.
- O 3310. Idle time - wait help.

Reducing the values of these four variables tends to reduce throughput time.

- (2) O3315. Material waiting time. Reducing the value of this variable reduces throughput time.
- (3) O3316. Storage time. Any reduction in the time that materials remain in stores will reduce throughput time. (See Fig.12).
- (4) O3406. Shortages
- (5) O3407. Overdue orders.

Any reduction in delays will reduce throughput time.

Experience finds that the most significant of these output variables in relation to Throughput time are "Idle time" "waiting time" and "Storage time". Research has indicated that with Process organisation and multi-cycle ordering, the Throughput time is often 100, or more times greater than the sum of the Operation times.

6. SECOND & LATER ORDER CHANGES.

Fig.7.6 only shows the "first order" changes in a number of variables, which will reduce Throughput times. Any changes in other variables which induce the desired direction of change in the "first order" variables are "second order" changes.

This idea of "orders of change" or of change at a series of levels, has already been illustrated in Fig.7.3 which considered the way in which a reduction in "Throughput time" affects the values of other system variables.

Fig.7.7 now shows some of the 2nd order connectance variables which affect the value of the output variables listed in Fig.7.5 which in turn affect the value of Throughput time.

7. CONCLUSION

It will be realised that throughput time is a very complex Production System variable, with a great deal of "Connectance" with other system variables.

It is also a variable, which is difficult to measure.

Because it has however, a significant effect on the level of stocks in a company, and also therefore on both Investment and Costs, it is an extremely important variable in relation to the Economy of a company.

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Total <u>or</u> Marginal costing	79
Training hours per Employee	143
Transfer frequency	108
Transfer quantity	107
Transit store	58

Unit Assembly

25

Unit load

101

325

Value added	251
-------------	-----

Value of the pound (£)	158
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Value of standard product	30
---------------------------	----

	326
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A production system variable connectance model

Burbidge, John L.

1984-02

Cranfield Institute of Technology

<http://dspace.lib.cranfield.ac.uk/handle/1826/8754>

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