IE223L Workstudy and Methods Engineering

Student Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Student ID:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Program: BS Industrial Engineering

## Lab 07: To study fundamental hand motion and development of right-hand process chart with the help of camera.

## Apparatus:

1. Pen
2. Paper
3. Camera with accessories
4. Stopwatch

## Theory:

## Fundamental Hand Motions

Most work is done with two hands and all manual work consists of a relatively few fundamental motions that are performed over and over again. Frank G. Gilbreth, in his early work in motion study, developed certain subdivisions or events which he thought common to all kinds of manual work. He coined the work therblig in order to have a short word with which to refer to any of these 17 elementary subdivisions of cycle of motions. The experienced analyst has no difficulty in using these therbligs in industrial applications.

Although the word therblig is familiar to industrial engineers, the term motion or hand motion is preferred when discussing the subject of micromotion study with factory and office personnel.

**1.** Search: that part of the cycle during which the eyes or the hands are hunting or groping for the object. "She begins when the eyes or hands begin to hunt for the object, and ends when the object has been found.

**2.** Select: the choice of one object from among several. in many cases it is difficult if not impossible to determine where the boundaries lie between search and select. For this reason, it is often the practice to combine them, referring to both as the one therblig select Then the broader definition of select refers to the hunting and locating of one object from among Veral. "St begins when the eyes or hands begin to hunt for the object and ends when desired object has been located

**3.** Grasp: taking hold of an object, closing the fingers around it preparatory to picking holding it or manipulating it "G" begins when the hand or fingers first make contact with the object, and ends when the hand has obtained control of it

**4.** Transport empty (TE): moving the empty hand in reaching for an object it is assumed that

the hand moves without resistance toward or away from the object. "TE begins when the hand

begins to move without load or resistance, and ends when the hand stops moving

**5.** Transport loaded (TL): moving an object from one place to another the object may be carried in the hands or fingers, or it may be moved from one place to another by sliding, dragging, or pushing it along. Transport loaded also refers to moving the empty hand against resistance TL begins when the hand begins to move an object or encounter resistance, and ends when the hand stops moving

**6.** Hold (H): retention of an object after it has been grasped, no movement of the object taking

place. "H" begins when the movement of the object stops, and ends with the start of the next

therblig

**7.** Release load (RL): letting go of the object. "RL begins when the object starts to leave the

hand, and ends when the object has been completely separated from the hand or fingers.

**8.** Position (P): turning or locating an object in such a way that it will be properly oriented to fit

into the location for which it is intended. It is possible to position an object during the motion

transport loaded. "P" begins when the hand begins to turn or locate the object, and ends when

the object has been placed in the desired position or location

**9.**Preposition (PP):locating object an in predetermined place, or locating it in the correct position for some subsequent motion at "pp" is the same as position except that the object is allocated in the approximate position that will be needed later.

**10.** Inspect (I): examining an object to determine whether or not it complies with standard size, shape, color, or other qualities previously determined. The inspection may employ sight hearing, touch, odor, or taste. Inspect is predominantly a mental reaction and may occur simultaneously with other therbligs "I "begin when the eyes or other parts of the body begin to nine the object and ends when the examination has been completed

**11.** Assemble (A)**:** placing one object into or on another object with which it as an integral part. A begins as the hand starts to move the part into its place in the assembly, and ends when the hand has completed the assembly

**12.** Disassemble (DA)**:** separating one object from another object of which it is an integral part. "DA" begins when the hand starts to remove one part from the assembly and ends when the hand has separated the part completely from the remainder of the assembly

**13.** Use (U): manipulating a tool, device, or piece of apparatus for the purpose for which it was intended. "U begins when the hand starts to manipulate the tool or device, and ends when the hand ceases the application.

**14.** Unavoidable delay (UD): a delay beyond the control of the operator UD" may result from either of the following causes:

(a) a failure or interruption in the process

(b) an arrangement of the operation that prevents one part of the body from working while other body members are busy. "UD" begins when the hand stops its activity, and ends when activity is resumed

**15.** Avoidable delay (AD): any delay of the operator for which he or she responsible and over which he or she has control. It refers to delays, which the operator may avoid if desired. "AD" begins when the prescribed sequence of interrupted, and ends when the standard work method is resumed

**16.** Plan (Pn): a mental reaction, which precedes the physical movement that is. deciding how to proceed with the job. "Pn" begins at the point where the operator followed has been determined Mansio work out the next step of the operation, and ends when the procedure to be

**17.** Rest for overcoming fatigue (R): a fatigue or delay factor or allowance provided permit the worker to recover from the fatigue incurred by the work. R" begins when the operator stops working, and ends when work is resumed.

**TIME MEASURING UNITS**

**1 TMU 0.00001 hour**

**TMU 0.0006 min**

**TMU = 0,036 sec**

**1 hour= 100,000 TMU**

**1 min=1667 TMU**

**1 sec = 27.8 TMU**

## Objective:

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**Procedure**

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## Observations

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sr #** | **Name of Motion** | **Symbol** | **Description** | **Time** | **TMU** |
| **1** |  | **TE** |  |  |  |
| **2** |  | **G** |  |  |  |
| **3** |  | **TL** |  |  |  |
| **4** |  | **P** |  |  |  |
| **5** |  | **U** |  |  |  |
| **6** |  | **TL** |  |  |  |
| **7** |  | **PP** |  |  |  |
| **8** |  | **RL** |  |  |  |
| **9** |  | **TE** |  |  |  |

## Comments:

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