This manual is designed to assist you in the operation of your DSJ, DSJF, and Compassomatic Models of the Coxhead Composing Machine.

The finest materials and workmanship have gone into the construction of your DSJ. The Ralph C. Coxhead Corporation, manufacturers of Coxhead Composing Machines and the standard Vari-Typer, maintain Branch Offices in all principal cities of the United States and Distributors in many foreign countries where additional information may be secured.

It is our sincere wish that the work you produce on your DSJ or DSJF will conform to our high standard of quality, and we will do our best to aid you in maintaining this standard.
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INTRODUCTION

THE VARI-TYPER AND THE DSJ—WHAT THEY ARE

The Vari-Typer is an office machine on which master copies are composed for reproduction purposes. It is similar to a typewriter in appearance but has several special features which greatly increase the scope of work which can be accomplished on it. The principal features of the Vari-Typer are interchangeable type faces and spacings. These features alone enable a Vari-Typist to produce copy with a printed appearance. In addition to these features there are others which add to the quality of master copies prepared on this machine. One is a mechanism for typing with an even right hand margin; another, an electrically controlled hammer which strikes with the same pressure no matter how hard or lightly the letter keys are depressed, thus producing copy of a uniform quality.

The DSJ Composing Machine is a development or outgrowth of the standard Vari-Typer. Its principal feature is the different space allowed each letter according to the particular characteristics of the letter. The name DSJ, an abbreviation for Differential Spacing Justifier, incorporates the main features of this machine—differential spacing for letters and justifying (typing with an even right hand margin).

Anyone familiar with typewriter operation can easily learn to operate the Vari-Typer or DSJ, because they both have a standard universal keyboard. This, however, is the only similarity between the Vari-Typer and the typewriter. The purpose for which the machine is used, the mechanical operations, and the work which is produced are, for the most part, far removed from typewriter work. Typewriters, from the first practical model invented in 1867 to the present day machines, type with one face of type at one spacing. The standard Vari-Typer has more than 500 styles of type (instantly interchangeable) including all foreign languages and special symbol types, in sizes from large 18 point to tiny 5 or 6 point. It is equipped with from one to four horizontal spacings and five standard vertical spacings. The DSJ is equipped with four horizontal spacings and is unlimited in line leadings (vertical spacings). All these features are employed to give Vari-Typed copy, particularly that copy prepared on the DSJ, a distinctive printed appearance.

The primary use for the standard Vari-Typer is the production of master copies which will be duplicated by the stencil method, photo
offset, direct plate offset, blueprinting, gelatin and spirit duplication, photo engraving, and certain other processes. Although the DSJ may be used for any type of master copy, it is primarily applied to master copies for offset or photo engraving reproduction. The preparation of the master copy naturally depends upon the duplicating process to be used, but the basic mechanical operation of the Vari-Typer is the same for all kinds of master copies.

The uses to which the DSJ can be applied are practically limitless. Manuscripts, bulletins, instruction books, catalogues, house organs and magazines, forms, financial statements, correspondence, and lettering on tracings are only a few specific applications. Any office material which is to be duplicated by some standard process can be composed easily and attractively on the DSJ.

In addition to the advantages of attractive appearance, uniformity, and variety, the DSJ saves time, money, materials, shipping and filing space, and labor costs. Condensation (typing with small types at small spacings) reduces the number of master copies needed and is a time and labor-saving factor. Less duplicating paper is used and the time required in the duplicating process is greatly reduced. The DSJ has a unique importance as a typesetting medium to replace more expensive methods. This is probably the most important feature of the machine.

DSJ composition is creative work. A keen sense of judgment, balance, and proportion are helpful in all phases of master copy preparation: composition, planning layouts, and type selection. Most important of all is a thorough knowledge of the machine, what it will do, and finally the ability to operate it properly.

**BASIC OPERATION**

The DSJ has an important feature which differentiates it from the standard Vari-Typer. The standard Vari-Typer allows equal space for all letters regardless of the characteristics of the letter. For example, the small letter "i" is allowed the same space as the wider letter "n". The DSJ allows space for each in relation to its width. The resulting copy has a perfect printed appearance.

The handling of the DSJ varies so slightly from one application to another that a thorough understanding of the mechanical operation will serve as a basis for any type of work planned for the machine. It can be simplified so that only three adjustments in the machine are necessary to change from one master copy to another: ribbon, impression, and type. The mechanical operation will remain the same for any type of master copy. Vari-Typing does involve a certain amount of detail, but once the mechanical operation is mastered, it is a simple matter to apply it to many kinds of work. Remember that you did not learn the details of typewriting by trying them once. Repeat each step and combination of steps until they become natural and habitual.

There are many models of the standard Vari-Typer, but the basic mechanical operation is the same. The standard machine is available in several carriage lengths—16 inch, 20 inch, and 24 inch. The DSJ has a 16-inch carriage, which is the most efficient length for this type of machine.

You will find it necessary to operate the machine step by step. This manual is prepared in such a way that you can follow the steps page by page. It is usually necessary to understand each step thoroughly before you go on to the next. Do not try to eliminate the basic steps, because they are fundamental to the proper operation of the machine. The machine is so constructed that all parts will move freely and easily when properly operated. (Do not force any part.) If you have any difficulty making a part function, check your procedure in this manual. Any oiling or mechanical adjustments are a function of the service man. The proper procedure for operating each part is carefully outlined in the forthcoming pages.

**TYPING ACTION—ELECTRICALLY CONTROLLED HAMMER**

The typing action differs from that of a typewriter in one important respect. Instead of keys striking the paper from the front (as in typewriter action) a hammer comes forward from the back of the machine and presses the paper against the ribbon and type thus producing an impression on the paper. The action of the hammer is electrically controlled. To the operator this means that each letter will be uniformly black no matter how hard or lightly the letter key is depressed. This, in turn, insures a uniform master copy for reproduction.

Notice that the hammer action is described as being electrically controlled, not electrically operated. The machine is equipped with an electric motor, but this motor only operates on each 19th stroke of the keys. On the 19th stroke the motor winds a spring which gives the hammer mechanical power for the next 19 strokes. All of this is important to the operator in only two respects. First, the operator
should always check to be sure that the machine is plugged in if the machine should stop at any time, and, second, the machine is economical in the use of electricity and need not be disconnected when not in use as many electrically operated machines must be.

The DSJ is equipped with a Universal 115-volt motor, which will operate on AC or DC current. For 230 volts, a 230-volt motor must be used. The motor produces a slight "whir" after every 15 strokes of typing, but this, as explained above, is a natural operation of the machine.

**CARRIAGE**

**Paper Table and Paper Guides.** Paper is inserted into the DSJ in a vertical position. The gray paper table on the carriage keeps the paper in a vertical position. Sliding paper guides located on the paper table prevent the paper from falling forward while typing. These guides may be moved closer together for narrow sheets of paper or further apart for wider sheets of paper.

**Alignment Scale.** Attached to the paper table is an alignment scale, marked in inches and twelfths of an inch. This scale is used for straightening the alignment of paper in the machine or for measuring starting points or margins. When typing, the scale should be moved up out of the way of the typing.

**Feed Rolls and Feed Roll Release Lever.** Directly below the paper table are the feed rolls. They consist of one large rubber roll in the back and four small sectional rolls in the front. The feed rolls are constructed this way to allow a better grip of the rolls on the paper.

At the right end of the carriage is the feed roll release lever (Fig. 1) which opens and closes the feed rolls. Pull the lever forward to close the feed rolls; push back to open. To reduce wear on the rubber feed rolls the feed rolls should always be left open when not in use.

**Carriage Release Lever.** Behind the feed roll release lever on the right is a carriage release lever which operates like the carriage release lever of a typewriter to permit the operator to move the carriage back and forth. There is a similar lever on the left end of the carriage.

**Paper Basket and Paper Insertion.** Below the feed rolls is a transparent paper basket. This is the place from which the paper comes while typing.

To insert paper, press the feed roll lever back to open the feed rolls. Slip the paper between the feed rolls in the center of the carriage. Allow the paper to drop to the bottom of the paper basket. Pull the feed roll lever forward. The rolls will close, holding the paper firmly.

Roll the paper down into the carriage by turning the feed roll knob. Align the paper by dropping the paper alignment scale. Open the feed rolls slightly by exerting a light pressure with the right hand on the feed roll release lever at the same time adjusting the paper with the left hand. After paper is properly aligned, move left and right paper guides into position on each side of the paper.

Many operators prefer to roll the paper into a cylindrical shape, allowing about two inches to extend at the top for easy handling. The cylinder of paper can then be inserted into the basket with the top edge protruding through the feed rolls. This prevents any folding or creasing of the paper in the basket.

To type at the bottom edge of a card or sheet of paper, clip the card or paper to a longer sheet that can be held firmly in the feed rolls. Feed rolls will maintain feed to within 3/8" of bottom of sheet.

**Split Roller.** When inserting a heavier paper, a stencil, or paper or metal plate, it is sometimes necessary to use the split roller. This is a wooden pole about six inches longer than the carriage in which it is to be used. The roller is split in two halves and hinged. A strip of sponge rubber which runs the length of the roller insures the plate being held firmly in place. On each end of the roller is a hook clamp. To release the clamp, simply pull the hook away from the end of the roller so that one stem of the clamp is disengaged from the hole slot in the roller. Both end clamps must be released before the roller can be opened.
Slip the wooden roller into the paper basket. Center the roller so that about the same length of roller extends from each end of the basket. Open the jaws of the roller by releasing the end clamps. Be sure the open jaws of the roller are up in the basket. Drop the plate between the feed rolls so that the end of the plate drops into the open jaws of the roller. (Watch the plate through the transparent basket.) Close the jaws of the roller and lock them with the two end clamps. Close the feed rolls. Roll the plate down in the machine turning the split roller away from you to take up all the slack in the plate. The purpose of the split roller is to facilitate handling of the plate, and it is important to remember to always turn split roller when rolling plate down in the machine. (This applies when making corrections as well as in the original insertion of the plate.)

Marginal Scale and Marginal Stops. The marginal stops are located on a scale at the lower front part of the carriage. This scale is coordinated with the paper alignment scale so that the marginal stops may be set by determining the desired location on the alignment scale. Like the alignment scale, the marginal scale is marked in inches and 1/12ths of an inch to correspond with pica measurements used in printing. Since there are six picas to one inch, each mark on the marginal scale is equal to one-half pica. On the DSJ the right hand marginal stop is removable. When this removable stop is on the machine, be sure that it is firmly attached and not left partially open. It must fit snugly into the teeth of the marginal scale.

Marginal Release. The carriage release lever on the DSJ acts also as a marginal release. If you wish the marginal stops to stop the carriage, do not use the release lever to return the carriage. Simply return the carriage by pushing carriage return lever (at left end of carriage) or by pulling carriage to the right.

Tabulator Stops. The tabulator stops are located at the rear of the carriage on a scale that corresponds with the alignment and marginal scales. Move the stops pull them out and insert them between the ridges or teeth on the scale. Insert the tabulator stop with the open end down, the desired number centered between the two prongs.

The use of tabulator stops for statistical or tabular copy is not recommended. The tabulator scale and stops will be used mainly in the justification of the right hand margin of text copy. The part they play in this operation will be discussed in the section on justification.

All three scales, alignment, marginal, and tabulator, are marked off in inches, which in turn are divided into 12ths or half-picas.

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Keep this in mind when you are locating any point on the scale in fractions of an inch.

**RIBBON SHIELD**

Never use the DSJ without a ribbon shield even when no ribbon is used, as in stencil typing. Although the standard Vari-Typer has a variety of shields, there is only one shield that may be used on the DSJ. This shield is shown in Fig. 2, and the part number is 13-AS-1011. The DSJ shield may be identified by a small, punched dent directly below the shield opening (shield window). Be sure that the correct shield is used on your machine. Never use a DSJ shield on a standard Vari-Typer or vice versa.

**RIBBON INSERTION**

A carbon paper ribbon is used on the DSJ to produce sharp copy. A fabric ribbon produces copy which is fuzzy and heavy, and when this type of copy is reproduced through photography, the copy becomes even blacker and fuzzier. The carbon paper ribbon, if inserted and used properly, will produce the best copy for reproduction purposes.

There are three main sections of the machine which are used in ribbon insertion. These are hidden by the front cover of the machine. The first step in ribbon insertion is to remove the front cover. To do this, grasp the cover with both hands, curling your fingers under the part of the cover nearest the carriage. Lift the cover toward you, and it will come off easily. When you have done so, you will see much of the mechanical section of the DSJ. The three main parts used in ribbon insertion are: (1) the ribbon cup (at the left, Fig. 3 A), (2) the ribbon shield and holder (in the center, Fig. 3 B), and (3) the carbon feed mechanism (at the right, Fig. 3 C). Instructions for the use of these parts are as follows:

(a) **THE RIBBON CUP.** The ribbon cup is in a vertical position at the left side of the machine. In order to remove the cup, the carriage must be pulled all the way to the right, as far as it will go. Then grasp the ribbon guide (attached to the ribbon cup) and lift the cup out of the machine. Turn the cup up so that the spindle on which the ribbon runs is up. Place spool of carbon ribbon in cup, so that it is running counterclockwise (in the opposite direction of a clock hand). Drop ribbon cup into position, making sure that the two ridges on the right side of the cup rest on the two prongs which hold the cup in position. Pull a little of the ribbon to see if the spool is turning freely. If it is not turning easily, the cup is probably in the wrong position. Adjust cup and test ribbon again.
Attached to the ribbon cup is a ribbon guide. There is a cross-shaped cap on the guide which may be opened by pressing on the base of the cross. While the cap is open, place the ribbon in the guide slot and release the cap.

(b) THE RIBBON SHIELD AND HOLDER. The ribbon shield, briefly mentioned before, holds the ribbon in position for typing and protects the copy from becoming smudged. The ribbon shield has a hole in it called the window of the shield. It is slightly larger than the hammer face which presses the paper against the ribbon and type to give the uniform impression desired. On either side of the window are two ribbon slots through which the ribbon must pass, and at the ends of the shield are two slots which hold the shield on the shield holder. Directly above the window in the shield is a pointer.

To remove the ribbon shield from its holder, move the holder control lever (which is right of the shield holder) to the left. This squeezes the prongs of the shield holder together so that the shield can be removed. Lift the shield off the holder prongs. There are several ways of lifting the shield—reaching behind the paper table and starting the shield up with your fingertips, using a pair of tweezers to grasp the shield, or by using a hook (made from a straightened paper clip) in one of the shield river holes.

Hold the shield with ribbon shield pointers up and the two ribbon slots facing you. Hold the ribbon with the carbon side away from you, and thread it through the ribbon slots. Replace the shield on the frame by dropping each end loop on the holder prongs. Be sure that holder control lever is still pushed to the left, and that one holder prong goes through each end loop. After shield is in place, release the holder control lever by moving it slightly to the right.

(c) THE CARBON FEED MECHANISM. Push back the small wheel on the carbon feed mechanism. This will separate the two wheels so that you can slip the carbon ribbon between the two wheels. Tap any key on the keyboard several times to see if the ribbon is moving. If the wheels on the carbon feed mechanism are actuated by the ribbon control knob on the right side of the machine, Fig. 4.) If you wish to feed a small amount of ribbon through the machine without striking the keys, merely turn the ribbon control knob toward you.

KEYBOARD.

Capitals and Figures. In giving the following typing instructions it is assumed that the prospective operator is familiar with the arrangement of the standard typewriter keyboard. The letter arrangements of the DSJ are the same as the standard typewriter. However, the DSJ has only three rows of keys, the fourth row of the standard keyboard having been eliminated by combining the numerals with the first row of characters. The figures are typed by using either of the figure-shift keys at the end of the lower two rows. The capital shift keys are located just below the figure shift keys in the standard keyboard location (Fig. 6).

There is a nickel capital shift key lock at the left end of the keyboard directly behind the capital shift key. To lock the capital shift, hold the key down and pull the lock toward you. To release, press the lock back; the key slightly as it rises. To lock the figure key, hold the figure key down and bring the nickel lock directly
behind the figure key straight forward. To release, press back on lock lever. (Note: Whenever it is necessary to type a few figures and the capital key is locked, it is not necessary to unlock the capital key. Simply press the figure key for the required figures, then release and machine will still be in position for typing capitals.)

**Bold Face Repeat Key.** Many styles of type can be used for headings and subheadings. Sometimes these styles need to be darker or bolder than one stroke of the hammer will produce. In such instances the repeat key is used. The key is located on the extreme left side of the keyboard (Fig. 5 marked REPEAT). To operate the repeat key, depress the key and hold it. This holds the carriage in one position while you strike the letter key as many times as is necessary to achieve the boldness desired. Usually a letter is repeated until it has a full coverage of carbon from the ribbon. (If a letter is not completely covered, it will not reproduce properly, or if a stencil, the letter must be repeated until it cuts through the stencil wax.)

Only large bold types will require the use of the repeat key, and these types are used solely for headings or for an occasional word in the copy which you wish to emphasize. Do not choose a type for body copy that requires the use of the repeat key on every letter. The repeat key is used primarily for typing in all capital letters, whereas that same type may not need the repeat key for small letters. This applies to all master copies.

**Type Change Key and Type Insertion.** At the left end of the keyboard is the type change key (Fig. 6). This key is used in inserting and removing types. Following are the instructions for inserting type:

1. Depress the type change key. The anvil (center of machine) will rise. The type change key will lock automatically.

2. Hold the type between the thumb and forefinger (Fig. 7) with the "web" out. The eyelet hub in the "web" (Fig. 8) should be down.

3. On each side of the anvil (Fig. 9) you will find a dot (A Fig. 9). The slot (B Fig. 9) in the anvil is wider at these points (C Fig. 9) to permit insertion of the type.

4. Insert type so that the eyelet enters slot at the wide point under the dot.

5. Slide the type plate to the left until the center line of the type is exactly in line with the center line of the anvil. The center of the anvil is marked by a small notch (D Fig. 9) about three-eighths of an inch to the left of either red or black dot previously mentioned. The anvil slot running around the entire anvil (B Fig. 9) must be kept clean at all times. A folded 3 x 5 card or a folded sheet of paper run through the slot will pick up any dirt that may be lodged there.

6. Push back on the small nickel lever directly back of the type change key (Fig. 5) to release it. Brace the key slightly with another finger at the same time so that type change key will rise slowly and the anvil will be lowered gently. Try to avoid banging the anvil down in the machine. If the anvil does not drop into position, it may be that the type plate has shifted from its center position. Readjust
FIVE BASIC SETTINGS

Whenever a new or different type is used on the DSJ, there are five basic settings which must be made on the machine. These settings are essential for the proper operation of the DSJ. In many cases only one or two of these settings change from one type to another, but all five settings should be checked before proceeding to the typing operation. A complete description of each of these settings will be found on the next few pages, but a brief check-list of these settings is listed here:

- Differential-Standard Operation Knob.
- Space adjustor lever.
- Horizontal spacing.
- Vertical spacing (Standard or Vari-Line gears).
- Impression.

Differential-Standard Operation Knob. On the right side of the machine is a control knob which may be set for standard or differential operation (Fig. 10). The knob has a small dot which indicates the setting being used at any time. If a standard type is being used, the dot indicator must be set for standard. If a differential type is inserted, the setting must be changed to differential.

Every type has a style number which appears just above the center black line of the type. All differential types have style numbers starting with 600. In other words, any type bearing a style number of 600 or above (e.g. 600, 610, 640, 710, etc.) is a differential type. Types with style numbers below 600 (e.g. 380, 232, 229, etc.) are standard types. Thus a type may be easily identified as being standard or differential merely by looking at the style number.

If a standard type has been inserted, turn the knob indicator away from you as far as it will go (until the indicator dot is on Std). When using a differential type, turn the knob toward you until indicator dot is on Diff. Standard types cannot be properly used when the machine is set for differential spacing or vice-versa.

Space Adjustor Lever. Directly above the center of the keyboard is a nickel lever called the space adjustor lever. The function of this lever is to adjust the space bar for the proper spacing between words in the copy. It has no effect on any other part of the keyboard—only the space bar. If small space is desired between words in the copy, the lever should be pushed to the left. If wider space between words is preferred, the lever must be pushed to the right (Fig. 11).

The exact space the space bar takes at different settings will be discussed in the section Increment Chart and Spacing. Usually the space adjuster lever is set on small for justified copy due to the nature of the justifying action of the DSJ. This will be discussed further in the Justification section.

Horizontal Spacing.

STANDARD HORIZONTAL SPACINGS. The Pica typewriter (large size type) is built to type 10 characters to the horizontal inch.
The Elite typewriter (medium size type) types at 12 characters to the inch. The standard Vari-Typer is equipped to give you both of these spacings plus two additional ones, 14 and 16 characters to the inch.

The DSJ has four standard horizontal spacings—13, 14, 16, and 18 characters to the inch, because these spacings are more commonly used spacings for printing composition. The lever for setting the machine at any of these spacings is located on the right side of the machine (Plate 1). Each setting is marked both with a letter and a number. The numbers apply only when the machine is being used with standard types; the letters, when differential types are being used.

The above spacings are provided to accommodate all sizes of types commonly used in Vari-Typer composition. The smaller the type, the less space each character need occupy, and therefore more characters may be typed in one inch. A single type at two different spacings will present two different effects. When using standard types, an all-capital type may require a wider spacing than the same type when used for text copy.

Typed with the lever set at:

13 — 1234567890
14 — 1234567890
16 — 1234567890
18 — 1234567890

To shift from one horizontal spacing to another spacing, simply move the horizontal spacing control lever down, and slide the lever

forward or backward to the desired spacing notch and release. Each standard type has a proper horizontal spacing. The proper setting is one which places the letters as close together as possible without touching each other.

Leave the horizontal space lever in the notch nearest you, when the machine is not in use.

**DIFFERENTIAL HORIZONTAL SPACINGS.** The style numbers of differential types have two additional markings which are important. One is a number which indicates the point size of the type. For example, type 620-10 is a 10 point size type in the 620 style. (A further discussion of point sizes is given in the section Vertical Spacing—Vari-Line Gear). Directly after the point size number of the type is a letter, A, B, C, or D. The letter designated is the proper horizontal spacing for the type. In differential operation letters occupy different amounts of space. The space which the carriage travels horizontally across the page is divided into small units called increments. All letters on the keyboard, therefore, occupy different increments of space. For example, the letter "m" occupies 4 increments; the letter "W", 2 increments, etc. An Increment Chart for the entire keyboard is located in the section Increment Chart and Spacing.

The fact that different letters occupy different increments of space makes it impossible to say that a differential type is typed at 13, 14, 16, or 18 characters per inch, for if we set the machine at 14, for example, and typed a line of 14 m's just above a line of 14 I's, the two lines would not be the same length. For this reason letters are used to indicate the four horizontal spacings for differential types. A is the widest spacing; B is the next widest; C, the next; and D is the smallest horizontal spacing at which a differential type may be used. Since each differential type is marked with a certain letter, simply move the space shift lever on the right side of the machine (Fig. 12) to the notch which is marked with the corresponding letter. For example, B spacing would be used for type 620-10B.

**Vertical Spacing.**

**STANDARD VERTICAL SPACING.** In addition to the four horizontal spacings, the Vari-Typer (both Standard and DSJ) is equipped with five standard vertical spacings. When the feed roll knob is turned slowly, you will hear and feel "clicks". Each of
these "clicks" is equivalent to 1/18th of an inch. Thus eighteen
clicks equal one inch.

- 2 clicks equal 9 lines per inch.
- 3 clicks equal 6 lines per inch.
- 4 clicks equal 4 1/2 lines per inch.
- 5 clicks equal 3 3/5 lines per inch.
- 6 clicks equal 3 lines per inch.

In the hack, at the left end of the carriage, there is a small
chrome-plated knob that can be raised about an eighth of an inch.
Lift this and move it into the desired notch. The line space lever
(Plate 1) will space the lines from nine to three per vertical inch
depending upon the setting of the knob.

Setting the vertical spacing knob in the first hole at the top
will allow the feed roller to turn two clicks, or 9 lines to the inch;
the second opening will allow 3 clicks, or 6 lines per inch, etc.

<table>
<thead>
<tr>
<th>Hole Setting</th>
<th>Spacing</th>
</tr>
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<tbody>
<tr>
<td>1 (1)</td>
<td>2 clicks - 9 lines per inch</td>
</tr>
<tr>
<td>2 (2)</td>
<td>3 clicks - 6 lines per inch</td>
</tr>
<tr>
<td>3 (3)</td>
<td>4 clicks - 4 1/2 lines per inch</td>
</tr>
<tr>
<td>4 (4)</td>
<td>5 clicks - 3 3/5 lines per inch</td>
</tr>
<tr>
<td>5 (5)</td>
<td>6 clicks - 3 lines per inch</td>
</tr>
</tbody>
</table>

This is typed at 9 lines to
the vertical inch; there are
2 clicks between lines.

This is typed at 3 3/5 lines
to the vertical inch; there
are 5 clicks between lines.

This is typed at 6 lines to
the vertical inch; there are
3 clicks between lines.

This is typed at 3 lines to
the vertical inch; there
are 4 clicks between lines.

This is typed at 4 1/2 lines
to the vertical inch; there
are 6 clicks between lines.

**VARI-LINE GEARS.** Other vertical spacings can be obtained
by using a special attachment on the machine called the Vari-Line
Spacer. The proper vertical spacing must be used with each differ-
ential type. The spacings used with these types correspond with a
printer's method of line spacings or leadings.

As previously mentioned, types are measured by point sizes.
In printing terms, 72 points equal one inch, so that a type which is
12 points in size occupies approximately one-sixth of an inch of
vertical space. Furthermore, a printer gauges line spacings of types
not in lines per inch but rather in points and point leading. Point
leading is extra space added between lines. For example, a printer
may refer to a type as "8 point set solid" which means an 8 point
type set without extra space between lines. He may also refer to
a type as being set "8 on 10". This means an 8 point type leaded 2
points so that each line of copy occupies 10 points of vertical
space. In other words, 2 points of extra space have been added
between lines of copy.

So that Vari-Typists may be able to compose copy in a man-
ner similar to printed copy, a set of extra gears has been provided
on the machine to produce vertical spacings in terms of points.
There are ten of these gears, each gear marked with the point size
spacing which the gear will produce. A chart of these gears is
listed below:

<table>
<thead>
<tr>
<th>Required Point Size</th>
<th>Gear To Use</th>
<th>Number of Clicks</th>
<th>Lines Per Inch</th>
</tr>
</thead>
<tbody>
<tr>
<td>5½</td>
<td>5½</td>
<td>1</td>
<td>14</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>7</td>
<td>7-14</td>
<td>2</td>
<td>10.32</td>
</tr>
<tr>
<td>7½</td>
<td>7½</td>
<td>2</td>
<td>9.358</td>
</tr>
<tr>
<td>8</td>
<td>Left Feed</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>8½</td>
<td>Roll Ratchet</td>
<td>2</td>
<td>8.5</td>
</tr>
<tr>
<td>9</td>
<td>8½</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>9½</td>
<td>9</td>
<td>2</td>
<td>7.57</td>
</tr>
<tr>
<td>10</td>
<td>9½</td>
<td>2</td>
<td>7.22</td>
</tr>
<tr>
<td>11</td>
<td>11</td>
<td>2</td>
<td>6.55</td>
</tr>
<tr>
<td>12</td>
<td>Left Feed</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>13</td>
<td>Roll Ratchet</td>
<td>4</td>
<td>5.5</td>
</tr>
<tr>
<td>14</td>
<td>7-14</td>
<td>4</td>
<td>5.16</td>
</tr>
</tbody>
</table>

*DSF Vari-Line gear scales are included as a supplement to this manual.*
When a gear is being selected for copy, the operator simply adds the point size of the type to be used to the amount of leading desired. The result is the size gear to be used. For example, if a ten point type is being used and one point of leading is desired, an eleven point gear would be used.

Notice that there are 13 different spacings listed on the gear chart, although there are only ten gears provided. This can be accounted for by observing certain of the spacings listed. In order to obtain 7 point spacing the chart advises that the 7-14 gear should be used, and the gear should be turned two clicks between lines of copy. The gear indicated for 14 point spacing is the same one (7-14), but in this instance the gear should be turned four clicks between lines to produce 14 point spacing.

When 8 point spacing is required, the chart indicates that the left feed roll ratchet be used. This refers to the standard gear. In the discussion on standard vertical spacings we found that 2 standard clicks produced 9 lines per inch. Since that is the same number of lines per inch obtained at 8 point spacing, no special gear is necessary. The chart also indicates that standard spacing of 3 clicks is used to obtain 12 point spacing. In other words, each click of the standard gear is equal to 4 points of vertical spacing. After observing these special cases on the gear chart, it is easy to account for the three extra spacings listed on it.

**BASIC PATTERN OR FORMULA OF GEAR CHART.** In order to obtain a better understanding of the Vari-Line Gear Chart, it is advisable to consider the chart not as an isolated set of figures, but rather as a chart which conforms to a pattern or formula.

This is the basic pattern of the gear chart:

(a) Point Size Gear Used \( \times \) Lines per Inch equals 72 points

*Example:* 6 point gear \( \times \) 12 lines per inch equals 72 points.

This formula may be arranged for planning the layout of copy. For example, suppose that 14 lines of copy must be placed in two inches of vertical space. This means that a spacing as close to 7 lines per inch as possible would be required. By re-arranging the basic formula of the gear chart, the proper point size gear for this copy could be determined.

(b) 72 divided by Lines per Inch equals Point Size Gear

and

Maximum Size of Type.

*Example:* 72 divided by 7 equals 10 points.

Therefore, the 10 point gear must be used. It may be used with a 10 point type (0 leading; copy set solid)
a 9 point type (1 point of leading)
an 8 point type (2 points of leading)

This gear could not be used with an 11 point type, because if it were, the lines of copy would overlap.

It is sometimes necessary to find the number of lines per inch the gear will produce. In this case the formula pattern of the gear chart may be changed again.

(c) 72 divided by the point size gear equals the lines per inch.

*Example:* 72 divided by 11 points equals 6.55 lines per inch.

The above information regarding the pattern of the chart is given to aid the DSI operator in understanding the use of the Vari-Line gears when planning or fitting copy to a given amount of space. The only part which the beginning operator needs to remember is that the point size type plus the leading equals the gear size to be used. Below are some examples of the same copy, using the same type with different amounts of leading:

The honor of being the first inventor of movable types undoubtedly belongs to a Chinese blacksmith named Pi Shing, who lived about A.D. 1000, and printed books with them nearly five hundred years before Gutenberg cut his matrices at Mainz.

*Set solid* (lead one point)

The honor of being the first inventor of movable types undoubtedly belongs to a Chinese blacksmith named Pi Shing, who lived about A.D. 1000, and printed books with them nearly five hundred years before Gutenberg cut his matrices at Mainz.

*Led one point* (led two points)

The honor of being the first inventor of movable types undoubtedly belongs to a Chinese blacksmith named Pi Shing, who lived about A.D. 1000, and printed books with them nearly five hundred years before Gutenberg cut his matrices at Mainz.

*Led two points* (led three points)
INSTALLING THE VARI-LINE GEAR. The right hand feed roll knob is screwed into position (Fig. 12). Grasp the left feed roll knob firmly to hold the feed roll rigid. Take the right feed roll knob completely off the shaft. Behind the shaft is a detent spring with a roller at its end. A small lever moves this spring into position. Push this lever back. This will move the detent spring back from the shaft far enough to allow for the insertion of the gear: slide the selected gear on the shaft. It will fit smoothly on the roller. Replace right feed roll knob on shaft. Screw it firmly into position. Release detent spring lever. The roller on the end of the detent spring will rest between the teeth of the gear. Pull out the feed roll ratchet release pin (at the left end of the feed roll). This disconnects the standard gear. Leave the feed roll release pin out at all times while using the Vari-Line gear. The feed roll knob will now operate the Vari-Line gear.

Note: The line space lever cannot be used for feeding the Vari-Line gear. Only the feed roll knob will operate the Vari-Line spacer. To return to standard spacing, push the detent spring lever back (so that roller is disengaged from the Vari-Line gear teeth) and push the ratchet release pin in.

Impression Control. Impression is the strength with which the electrically controlled hammer strikes against the type plate. This hammer blow is controlled and can be set at the desired impression. The lower left side of the machine is a lever (Fig. 13) that can be set at one (light), two (medium light), three (medium heavy), and four (heavy) impressions. The setting of the hammer impression is dependent upon the size and boldness of the type and the material on which you are typing. For instance, a very small and sharp type may need No. 1 or 2 impression, whereas a larger, bolder type will need No. 3 or 4 impression. No. 2 impression may be sufficient for a specific type on paper, but No. 3 or 4 impression may be necessary for that same type on a stencil. The operator should exercise judgment when selecting the proper impression for the work at hand. As a general rule, types used on paper require a medium impression; on paper plates, a light impression; and on stencils, a somewhat heavier impression. Use only sufficient impression to obtain satisfactory coverage of characters. If this rule is kept in mind in addition to the fact mentioned above as to size and boldness of types, the operator can judge quite accurately the proper impression to be used.

In addition to controlling the strength of impression, the machine also controls the uniformity of the impression. The construction of the DSJ assures the maintenance of uniform pressure on every character regardless of variations in operator's touch.

INCREMENT CHART AND SPACING

The ordinary space taken by typewriters or standard Vari-Typewriter parts, for the purpose of differential operation, is divided into thirds or increments on the DSJ. In other words, an increment is equal to 1/3 of an average space.

All letters on the DSJ keyboard have a certain increment value. The value of these letters is listed below to chart form:

<table>
<thead>
<tr>
<th>Increment Chart</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Increments</td>
</tr>
<tr>
<td>l f t j q z a x e v y m</td>
</tr>
<tr>
<td>1 2 3 4 5 6 7 8 9 0</td>
</tr>
</tbody>
</table>

It might be rather difficult to attempt to memorize this chart letter by letter, and it is not necessary that the operator do so, before operating the DSJ. You will find, however, that you will automatically get acquainted with the increment value of letters and symbols as

20
they are used, and it may be of some assistance to observe certain patterns of this chart in order to acquaint yourself with it more quickly. Some of these patterns are listed below:

1. All letters and symbols take either 2 increments, 3 increments, or 4 increments.
2. An average letter takes 3 increments. An average space is 3 increments. All other letters or symbols are below or above average.
3. Lower case letters take 3 increments.

Exceptions:

1 - i - l - t - 1 - t take 2 increments. Put these letters together, and they spell a phrase, "liht, ir," (light junior).

w - m take 4 increments. Put these letters together and they form an abbreviation for William. Put the two phrases together and they form, "liht, ir, Wm."

4. Capital letters take 4 increments. Exceptions: J (2 increments) S (3 increments)

5. Punctuation symbols:
   a. Unusually small symbols such as comma, period, etc., take 2 increments.
   b. All numerals and average size symbols take 3 increments.
   c. Fractions, percentage, ampersand (@), and the long dash (-), take 4 increments.

6. Space Bar takes a different number of increments depending on whether the space adjuster lever is set on Small or Large and the machine is set for Standard or Differential spacings:

<table>
<thead>
<tr>
<th>Small</th>
<th>Large</th>
</tr>
</thead>
<tbody>
<tr>
<td>Differential - 2 4</td>
<td></td>
</tr>
<tr>
<td>Standard - 2 5</td>
<td></td>
</tr>
</tbody>
</table>

7. 1/3 spacer takes one increment forward; 1/3 back spacer, one increment backward; 3/3 back spacer, three increments backward.

8. Standard type, when machine is set at Standard—all letters take 3 increments.

If the above general rules are studied carefully, you will soon learn the increment value of all keys on the keyboard.

**MARGINAL DIAL AND JUSTIFIER DIAL**

**Margin Indicator Dial.** On the front of the machine are two black circular dials. The one on the left (Fig.14) is called the margin indicator dial (or simply margin dial). Its main function is to enable the operator to keep the left hand margin even. Because the DSJ moves in such small increments of space, it is not always possible to line up the left margin by merely using marginal stops or alignment by eye.

The margin dial is equipped with a movable pointer which moves automatically in a clockwise direction as the DSJ is being operated. This pointer may also be turned by hand, providing it is turned in a clockwise direction only. The outer rim of this dial is also movable—in either direction. The outer rim has a small metal pin marker called "the outer rim marker." The outer rim marker plays an important part in the justification operation and will be discussed more fully in the section concerning that subject.

There is one more part of the margin dial which is extremely important. It is the white indicator mark at the top of the dial. This mark is used for the starting point or left margin of copy. When typing straight, unjustified copy (as in a letter), set a marginal stop for the desired left margin, pull the carriage against the left stop, press the 1/3 spacer key twice, and move the marginal pointer clockwise until it lines up with the white indicator mark at the top of the dial. This establishes an exact starting point for every line of copy.

On the second line of copy, bank the carriage (pull or push carriage against left stop), and press 1/3 spacer as many times as is necessary to line up the marginal pointer with the white mark. Do this on each succeeding line of copy and the left margin will be perfectly straight and even. It will usually be necessary to press the 1/3 spacer only once or twice before pointer lines up at mark, but the number of times the 1/3 spacer is pressed will probably vary.
slightly for each line, simply because there is usually a variation in the way we bank the carriage on each line. Once the marginal
pointer has been set (on the first line of copy) do not change its
setting as this change will affect the left margin of the copy.

This dial has further uses when justifying copy, but always remem-
ber that its main function is to keep the left margin even.

Justifier Dial: The black dial at the right (Fig. 15) is called the
justifier dial. It is marked with four separate scales of numbers. Each
scale is identified by a letter - A, B, C, and D. These letters corre-
spond with the letter markings of the four horizontal spacings. Each
scale is marked with numbers and individual increment markings.
These increment markings are important in the justifier operation and
will be described more fully later. This dial also has a movable
pointer which turns automatically during part of the justifier operation.

TOUCH AND ALIGNMENT

Touch of the DSJ: There is an essential difference in the touch of
the DSJ as compared with an ordinary typewriter. The first part of
the down-stroke swings the type plate into position to print the letter
deressed; the second part of the down-stroke releases the impression
hammer. It is essential in DSJ operation that the operator "bottoms" each key stroke. If a smooth rhythmical "follow-through" key stroke
is used, the operator will soon pick up speed equivalent to that used
on a typewriter.

The motion of the key strokes is not so much a "strike" as is a
"pressure". It will help you in learning the touch to hold your
hands closer to the keyboard than you have been accustomed to doing
when typewriting. Then your stroke will start from the level of the
key instead of above it and will utilize the entire strength of the
pressure to "bottom" the key. The touch of the DSJ keyboard is not a
"hard" or "heavy" touch. When you have mastered it, you will find
it smooth and rhythmical.

Alignment: At each side of the anvil, in contact with the paper, is
a black metal strip. These strips are called alignment guides and are
used to show typing alignment. The letters test upon the line
designated by these guides. In standard operation the center of the
toer to be printed is shown by the pointer on the ribbon shield as
well as the line anvil. It is advisable to test the alignment of
the line guides and pointer on the ribbon shield. Test the ribbon
shield pointer by typing "iii" and note the relationship of the
pointer to the "i". (This is a good alignment test when machine is
set for Standard; it does not apply to differential copy because of
the variation in the width of letters.) Test vertical alignment by
typing "xxxx" and noting the relationship of alignment guide to
the typed line. Be sure to hold or press paper against alignment
guide to insure absolute accuracy. The space between the paper
and the alignment guide will vary, and alignment will not be accu-
rate if paper is not held firmly against the guide. Do not try to locate
the desired writing line with the edge of the ribbon shield.

These guides will be used constantly in filling in corrections,
forms, etc. When an erasure has been made, always follow these
two alignment guides in returning your paper to the typing line. The
paper alignment scale may also be used for alignment when the paper
is first inserted into the feed rolls, but always leave the paper scale-
up while typing.

CLEANING AND CARE

There are eight parts of the DSJ which should be cleaned daily to
ensure proper operation of the machine. The machine is usually
cleaned each morning before starting the day's work. The entire
cleaning operation does not consume more than about five minutes
and is well worth the time; for a clean machine will give you clean,
attractive copy.

Although there are eight parts to clean, it may be easier to con-
sider them in pairs. Following is a list of the parts to be cleaned:

1. Feed rolls and basket;
2. Alignment scale and alignment guides;
3. Types and anvil;
4. Ribbon shield and carbon ribbon feed mechanism.

The best cleaning fluid for the DSJ is denatured alcohol. This is
the fluid that should be used for the best results. If denatured alcohol
is definitely unobtainable, carbon tetrachloride may be substituted.
No other cleaning agent should be used.

Feed Rolls and Basket: When the machine is not in use, the feed
rolls should be left open. They should be cleaned daily; more fre-
quently when any stains are being typed. Do not leave the stencil
in the feed rolls any longer than it is necessary to complete typing
on it. Lack of frequent cleaning may cause uneveness in the feed
rolls and result in paper slippage. Close the feed rolls, tub with a
soft cloth, dampened with alcohol, as you turn the rolls. Be sure to
allow time for the alcohol to dry.
Clean the basket by using the split roller with a piece of cloth wrapped around the end. Slide the roller through as many times as is necessary to remove all dust and carbon particles.

Alignment Scale and Alignment Guides. Dampen the cleaning cloth slightly with alcohol and rub the back of the alignment scale. Reach behind the paper table and run cloth along the alignment guides.

Types and Anvil. Type fonts should be cleaned about once a day. The back of the type will need more frequent cleaning than the front of the type. With a cloth dampened with alcohol rub the back of the type that comes in contact with the anvil. Failure to keep the type and anvil clean may result in sluggishness of the typing action. To clean the front of the type, dip the type brush in denatured alcohol and brush the surface of the type. Dry the type immediately with a dry cloth. Never soak types in alcohol or any other cleaning agent.

The anvil slot must be cleaned daily. Fold a stiff paper or card and run it back and forth in the anvil slot. Be sure to clean well around both sides. A drop of alcohol on the paper will remove the carbon more easily. If you use alcohol, always follow with a dry piece of paper. The outside of the anvil may be wiped with a clean cloth; if necessary, use alcohol on the cloth. It is important that the anvil and types be immaculate to facilitate the movement of the type in the anvil. A carbon accumulation may cause the type to "stick" (fail to return to center after the character has been typed). If this occurs, the first measure is to clean both anvil and type. Also try the type on the opposite side of the anvil.

Care should be exercised in replacing types in type drawer. Always be sure that type is straight in the slot provided for it. Careless handling may result in a bent web on the type – another cause of type "sticking".

If a type continues to "stick" after anvil and types have been cleaned, contact the nearest service representative. Do not attempt to bend or adjust the type yourself.

Ribbon Shield and Carbon Ribbon Feed Mechanism. Remove the ribbon shield from shield holder, and rub both sides with dampened cloth. Always be sure that the ribbon shield is adjusted properly on the shield holder. Each time the ribbon is threaded into it. An improperly set shield may cause damage and call for too frequent replacement. The shield is usually replaced when it becomes damaged around the hole or window. Damage at this point may cause frequent ribbon breakage, shield marks around letters, etc.

As carbon ribbon passes through the wheels of the ribbon feed, it may flake and fall in the grooves of the wheels. These wheels should be cleaned daily by brushing with the type brush. Avoid brushing carbon specks into the mechanism of the machine. Fold a piece of paper and hold it under the wheels as you are brushing them.

How to Leave Machine When Not in Use. A few simple rules in the proper care of the DSJ will enable you to obtain maximum efficiency in the use of the machine. These rules are made to allow the least amount of tension on springs and other parts of the machine. When the machine is not in use:

1. Leave the feed rolls open. Do not leave a stencil or plate in the machine overnight or for any long period.
2. Set space shift lever at D.
3. Set impression lever at L.
4. Remove types and allow anvil to drop back into place. (Release type change key.)
5. Place cover over machine.

SUMMARY

The entire section of Basic Operation just covered should acquaint you with all the parts of the DSJ, their uses, their proper care, and enable you to do simple, straight composition on the DSJ. The following sections of the manual will not deal with any new parts, but will show you how to put these parts to use in producing attractive, justified copy for magazines, booklets or newspapers; copy for price lists, catalog pages, or any copy of a tabular nature; how to produce attractive forms, etc. Now we shall see how the details learned in this first section will become automatic parts of the definite applications of the DSJ.

AUTOMATIC JUSTIFICATION

One of the most important features of the DSJ is the fact that copy can be composed with an even right hand margin. This process is called justification of the right hand margin. Justified copy is more attractive than copy with a ragged, uneven right margin. This type of copy may be used in narrow column form for newspapers and magazines or in wider columns for bulletins, instruction manuals, etc.

When justifying copy, it is necessary to type it twice. Rough and finished copy is typed line for line on one sheet of paper. The rough
copy will have an uneven right margin; it will be cut off and discarded. The finished copy will have the desired even right margin and can be "fanned up" or mounted in preparation for photography (for photo offset or photo engraving).

**PARTS OF MACHINE USED IN JUSTIFICATION**

**Tabulator Stops.** In the Basic Operation section of this manual, instructions are given in the use of tabulator stops, i.e., how they are inserted, removed, etc. The tabulator stops and tabulator key play an important part in the justification process as will be seen when we follow the step-by-step process of setting the justifier.

A preliminary, general understanding of the justifier operation will aid you in understanding the importance of the tabulator stop. Marginal stops, set a given width apart, determine the width of the rough copy to be typed and, consequently, the width of the justified copy repeated on the right side of the page. These stops are usually set with the right marginal stop at "6" on the marginal scale and the left stop as many inches to the left of 6 as corresponds to the desired column width. (For example, right stop at "6" and the left at "2 1/2" for a four-inch column — four inches apart.)

Since the rough copy is going to end on "6", it is necessary to locate a starting point for the finished or justified copy as close to "6" as is practical. The position of the first tabulator stop right of "6" determines the starting point of the justified copy. It is best, therefore, to locate a tabulator stop about 1/2 inch right of "6", i.e., at "6 1/2" on the tabulator scale.

The reason the tabulator stop is positioned about 1/2" away from the right margin of the rough copy is to reduce to a minimum the amount of space the carriage must move when the tab key is pressed and to allow for the maximum column width on a standard size sheet of paper.

**Margin and Justifier Dials.** The main function of the Margin Dial is to keep the left margin even. It is used in straight unjustified copy to keep the left margin of the copy even. We found that we could accomplish this by moving the marginal pointer on the dial to the white mark at the top of the dial to establish the starting point of the copy. In justified copy we need a second starting point — for the justified copy. For this second starting point we use the outer rim marker. The outer rim is moved until the rim marker lines up with the position of the marginal pointer. These are the basic functions of the white mark and rim marker — to establish starting points for both the rough and the justified copy. Detailed instructions for these two settings are given in the section, Detailed Steps in Justification.

The function of the justifier dial is to warn the operator that she is near the end of the rough copy line and to show exactly how many increments of space remain for typing. For example, suppose a C spacing type were being used. You would watch the C scale on the justifier dial. As you type the rough copy line across the page listen for the warning bell. Soon after the bell rings, the pointer begins to move. (The pointer must be up on the Justifier dial in order for the line to justify when it is repeated.) Suppose the pointer is on 12 on the C scale when you finish a word, and the next word to be typed is the word "there" - t-h-e requires 8 increments of space (2 for h, 3 for e). The space preceding the word requires 2 increments. Since there are 13 increments left on the line and only 10 increments are required for the word, there is enough room for the typing of the word. On the other hand, the next word to be typed might be "those" - t-h-e-o-s-e requires 14 increments plus 2 increments for space preceding word, or 16 increments. This word would then require more than the 13 increments of space left on the line and would have to be typed on the following line. In a short time an operator can tell at a glance whether or not there is enough space on the line for the next word.

**IMPORTANT:** See Carriage Rack Actuating Bar Lock, page 63.

**DETAILED STEPS IN JUSTIFICATION**

Following are the detailed steps for setting the justifier. Learn to follow these steps in the proper order, and you will find they will soon be simple and automatic. Before setting the justifier, be sure that the proper type is inserted and all basic settings have been made (horizontal spacing, etc.)

1. Set marginal stops the desired width apart. The right margin stop at 6; the left stop as many inches from 6 as corresponds to the column width. (For example, left stop at 4, right at 6, for a 2 inch column.)
2. Move the carriage to the right. Do not use the carriage release lever. Simply pull the carriage to the right with a firm even pull. This will bank it against the left marginal stop. Insert paper.
3. Press 1/3 spacer twice. (This is necessary to give carriage some "play" against left stop and to start carriage motion in a forward direction.)
4. Move marginal pointer in clockwise direction until pointer lines up with white mark at top of dial.

5. Type a line of copy until bell rings and justifier pointer moves up on justifier dial. Do not space after last word typed, and do not extend line beyond zero on the dial.

6. Press tabulator key.

7. Press 1/3 spacer twice.

8. Move outer rim on marginal dial until outer rim marker lines up with the marginal pointer.

9. Repeat line just typed on left side of page.

The justifier is now set. On the first line of copy the correct starting position has been determined for the rough and for the justified copy. On each succeeding line remember to line up the marginal pointer with the white mark before typing the rough copy, and with the outer rim marker before typing the justified copy. This is done by pressing the 1/3 spacer—not by moving the marginal pointer by hand.

When banking carriage to type rough copy, always be sure that marginal pointer falls left of white mark. If pointer falls on white mark or right of it, move carriage slightly to the left and rebank. Then press 1/3 spacer whatever number of times necessary to bring pointer to white mark. (The number of times the 1/3 spacer is pressed to bring pointer to white mark varies because of the variation in the way you bank the carriage on each line.)

After tabbing, press 1/3 spacer whatever number of times is necessary to bring marginal pointer to position of outer rim marker.

**Example of rough and justified copy:**

This is a sample of copy typed on the DSJ machine. The type used in this copy is the 8 point size of the Bodoni Book style of Varti-Typer type (600-8-C). Notice that the copy is typed line for line, rough and good, and that the copy on the rough side is not justified. This copy is headed one and one-half points, using the 9½ point gear.

This is a sample of copy typed on the DSJ machine. The type used in this copy is the 8 point size of the Bodoni Book style of Varti-Typer type (600-8-C). Notice that the copy is typed line for line, rough and good, and that the copy on the rough side is not justified. This copy is headed one and one-half points, using the 9½ point gear.

The proper setting for exact column widths is outlined in the next section. The operator should first master the above steps before proceeding to exact settings.

**JUSTIFICATION USING DSJ SCALE**

The DSJ Scale has been devised to aid operators in setting exact column widths on the DSJ. This is important for several reasons, but is particularly important when an operator is trying to match the width of previously composed copy (as in two- or three-line corrections). If the operator knows how wide the copy has been set (in terms of increments), she can quickly set up her machine and run a test line to obtain the same number of increments. Then she knows that the correction she types will match the width of the master copy. The scale may also be used for measuring the width of illustrations, thus aiding the operator in determining the space to be allowed for "run-arounds" (indentations of copy). In addition to having a complete increment chart at one end, the scale consists of three separate scales as indicated below:

1. **Top Scale.** Marked in inches and sixteenths of an inch. This scale corresponds with the markings of an ordinary rule.

2. **Middle Scales.** Increment scale for each of the four horizontal spacings. Each mark on these scales represents two increments.

3. **Bottom Scale.** Pica Scale. Each long mark represents one pica. The short mark is equivalent to one-half a pica. There are six picas to one inch. (A pica equals 12 points.) Each short mark on this scale is equivalent to the small individual markings on the marginal, alignment, and tabulator scales.

Below are the steps to follow in setting up an exact column width using the DSJ scale:

1. Set marginal stops the desired width apart. Right hand stop at 6; left stop as many inches from 6 as corresponds to column width.

2. Bank carriage firmly against left stop and press 1/3 spacer twice.

3. Move marginal pointer in clockwise direction until pointer lines up with white mark at top of dial.

4. Type a test line to determine the number of increments in the column width as the machine is set. You do not know in advance the exact number of increments you will obtain, because it depends on the setting of the marginal stops and the
way you bank the carriage the first time. However you do know approximately the number of increments you will obtain from the scale.

Use the letter I in typing the test line, and type them in groups of nine I's and one space. Since the letter I and the space bar each takes two increments, typing the I's in groups enables the operator to count the I's quickly by calling each group of nine I's and the space following it. ten I's.

**Example:**

```
10 20 30 40 50 4
```

*Total - 54 I's*

When typing test line,
(a) If pointer on justifier dial stops on ZERO, multiply the number of I's by two. This indicates the number of increments in the test line.

**Example:**

```
64 I's with justifier pointer stopping on ZERO. Total - 128 increments.
```

(b) If pointer on justifier dial stops on ONE, multiply the number of I's by two and add one increment. This indicates the number of increments obtained in the test line.

**Example:**

```
64 I's with justifier pointer stopping on ONE. Total - 129 increments.
```

5. Using the DSJ scale, determine the number of increments desired in the column. Compare this number with the number of increments obtained in the test line.

6. If test line is too long:

**Example:**

```
130 increments
```

*Desired width: 128 increments (3 inch column at B spacing)*

a. Rebank carriage; press 1/3 spacer until marginal pointer lines up with white mark. This brings carriage back to starting point of test line.

b. Press 1/3 forward spacer the necessary number of times to reduce test line to the desired number of increments. (In the above example, twice.)

c. Reset (move by hand clockwise) the marginal pointer to the white mark. This establishes a new starting point for the test line.

d. Retype test line.

**Example:**

```
130 increments
```

*Adjusted or corrected test line*

7. If test line is too short:

a. Rebank carriage; press 1/3 spacer until marginal pointer lines up with white mark. Count 1/3 spaces up to white mark. This indicates the number of increments of "play" between left stop and white mark.

b. If the number of increments short is less than the number of increments of play, press 1/3 back spacer the necessary number of times to increase the test line to the desired number of increments, and reset pointer. If, however, the number of increments short is equal to or greater than the number of increments of play, move the left marginal stop one notch (1/12 of an inch) further to the left. This will increase the play between the stop and white mark so that the necessary increments may be added by 1/3 back spacing from white mark and resetting pointer.

**Example A:**

*Desired width: 128 increments (63 I's with pointer stopping on ONE. Total - 129 increments)*

**Example B:**

*Desired width: 128 increments (63 I's with pointer stopping on ZERO. Total - 124 increments)*

*Note: When only one increment is needed it is usually unnecessary to move the left marginal stop. If three or four increments were needed, it would be necessary to move the stop.*
As you become acquainted with your DSJ and gain experience in the use of your machine, you will discover many short-cuts and "tricks" which will reduce your errors to a minimum. This section of instruction is devoted to emphasizing the importance of certain typing rules and to a description of such tricks that will enable you to operate your DSJ most efficiently.

THE SPACE BAR IN JUSTIFICATION

You will notice in typing justified copy that the justification or spread takes place between words. This is called word justification to differentiate it from the character justification method used on a standard Vari-Typer.

Since justification occurs between words, it is evident that the space bar has an important function in justifying copy. You will notice that the space bar has a "spring" or "bounced" somewhat different from that of a typewriter space bar. To operate the space bar properly and insure correct justification, press the space bar firmly with your thumb in the center of the bar. In other words, bottom the space bar as you bottom other keys of the keyboard.

This method of word justification is the only proper type for a machine such as the DSJ. Character justification in which a line is stretched between characters as well as between words would defeat the entire purpose of the DSJ, because letters are differentially spaced on this machine and if they were then stretched apart in the justification process, the copy would lose its attractive printed appearance.

Occasionally you may find that a line will justify but that all of the "stretch" has taken place after the first word (or on the first stroke of the space bar). This means that you have not bottomed the space bar properly on the rough copy side. Try retyping the line concentrating on bottoming the space bar on the rough copy. This will eliminate the jump or gap after the first word and allow justification to be evenly distributed throughout all the spaces on the line.

It is also important not to press the space bar after the last word typed on the rough copy side. This will result in the line being too short on the justified side. A good rule to remember is this: The number of increments typed on the rough copy side PLUS the number of space bar strokes taken MUST equal the number of increments typed on the justified side PLUS the number of space bar strokes.

PARAGRAPH INDENTATIONS AND PARAGRAPH ENDINGS

When indenting for a paragraph (on justified copy), do not use the space bar. Instead, use the 1/3 inch space three times for each regular space of indentation desired. The 1/3 inch space will not affect the justified copy, but the space bar will (as explained above). This rule applies to justified copy only. When typing straight or unjustified copy, the space bar may be used.

When you come to a short line such as a paragraph ending, type out the rough copy line and simply move the carriage (using carriage release lever) to the starting point of the justified copy. Do not press the tabulator key. The tabulator key releases the justifier mechanism to start stretching on every stroke of the space bar. As long as the tabulator key is not pressed, there will be no stretch on space bar strokes. Usually it is unnecessary to type anything on the rough copy side, but occasionally a line is typed if there is some doubt as to how long it will run. If no copy is typed on the rough copy side, merely bank the carriage to clear the justifier dial, move the carriage to the starting point of the justified line, and type line.

TYPOGRAPHICAL ERRORS

(1) Transposed letters. Some typographical errors on the rough copy require that the rough copy line be retyped. However, it is possible to avoid retyping in most cases. One common error is the transposition of letters in a word, such as this instead of this. A transposition error does not require retyping because the total number of increments in the word is the same in each case. Simply correct the transposition when typing the justified line.

Whenever it is necessary to retype a line, do not drop down to the next line (unless justified line has been typed), simply retype on top of the rough copy line. This copy is going to be discarded later so its appearance is unimportant. Your main objective should always be to save the justified line, even when there is an error in it, because it is much easier to correct a single word or two than a full line or several lines of copy. Such corrections are made by "pasturing" or "stripping in" the corrections over the errors.

(2) Typing too far on rough copy line. Sometimes you may either misspell a word in the middle of the rough copy line or type too far for the proper hyphenation of a word at the end of the line. In either case such an error may be corrected without retyping the line. Suppose, for example, you have typed go instead of for in the middle of a line. If you pause briefly at the end of your rough copy line and
glance over the copy, you will likely notice the error. Merely press the 1/3 back spacer once to remove an increment from the line; then when you type the justified line correct the word and the line will justify. Or perhaps you might type a word such as come (hyphenation for economics) and realize the hyphen should come after the e (e.g.). Since the letter e takes 3 increments, merely press the 3/3 back spacer once, tab, and repeat justified line using proper hyphenation.

Although this section refers to typing too far on the line, the same technique applies if a word is misspelled and not enough increments are in the rough copy line. For example, if you type the word then instead of than, simply press the 1/3 spacer once at the end of the rough copy line to make up for the necessary added increment if the correct word had been typed.

Sometimes errors of this type are not noticed until you have already tabulated and are ready to type the justified line. It is still not necessary to retype the justified line. Let us take the same example used before. If got were typed instead of got, it would mean that there is one more increment in the rough line than will be typed in the justified line, or, in other words, if the correct line be typed on the justified side, the line will be one increment short of being justified. To correct this simply press the 1/3 spacer once somewhere in the justified line (between words) and the line will justify. In the other case where them was typed instead of then, the justified line would be one increment longer than desired when the correct spelling is used on the justified copy. To correct this, press the 1/3 back spacer somewhere in the line to remove an increment and allow the line to justify.

These corrections apply when there has been an error in typed letters. They do not apply when the space bar has been struck too many times on the rough copy. If this happens, the rough copy line must be retyped.

HITTING SPACE BAR ACCIDENTALLY ON JUSTIFIED COPY

Occasionally, you may strike the space bar unintentionally or accidentally on the justified copy. The line can still be saved if you notice this error immediately. Suppose you have typed a few words on the justified line and in the middle of a word such as compose, you accidentally strike the space bar after co. Rebank the carriage and retype the rough copy line (right over the old line). Now if you tab and start typing on the justified line, you will be typing

The instructions for indenting from both margins implies that the indented copy is to be centered in relation to the wider column width. Sometimes this is not the case. However the instructions are practically the same. If the copy is to be indented 30 increments from the left margin and 50 from the right, it would be necessary to come in 80 increments on the rough copy. Then, instead of indenting half of 80 increments on the justified side, you would merely indent the required 30 increments from the left, and this would automatically leave 50 increments of space on the right side of the copy.

Learn to type the m's using a capital M for every tenth m, this will make it easy to recount the m's at any future time.

INDENTATION FROM BOTH MARGINS

1. Determine the total indentation desired (left margin plus the right) in terms of increments.
2. Translate this total number of increments into m's (or m's plus an l or n).
3. Line up with white mark on marginal dial.
4. Type the m's, etc., figured in step 2 and mark the dial. Type line of copy.
5. Tab, line up with outer rim marker.
6. Using the 1/3 spaceer, space in one-half the total number of increments and put second mark on dial. Type line of justified copy.
7. On each succeeding line—bank carriage, move carriage to a position near the first mark on the dial. Space up to exact position of mark (using the 1/3 spaceer), type line of copy.
8. On justified side—Tab, move carriage to a position near the second mark on dial. Space (with 1/3 spaceer) to exact position of mark (using the 1/3 spaceer), type line of copy.

Example of copy indented from both margins:

This is a sample of copy typed on the DSJ Vari-Type, showing an indentation of copy from both margins, using a total indentation of 20 increments which is equal to 5 m's. The m's were typed on the rough side. Then after tabbing, the 1/3 spacer was used to space in 10 increments and the dial.

This is a sample of copy typed on the DSJ Vari-Type, showing an indentation of copy from both margins, using a total indentation of 20 increments which is equal to 5 m's. The m's were typed on the rough side. Then after tabbing, the 1/3 spacer was used to space in 10 increments and the dial marked.
JUSTIFYING NARROW COLUMN WIDTHS

It is sometimes necessary to justify a column width which is very narrow. Actually you can justify as narrow a column width as you choose; providing there are at least two words on every line. Since the justifier mechanism stretches the space between words, it is obvious that at least two words must be placed on a line in order for the machine to justify the copy.

The narrowest column width which can be justified is therefore determined by the words per line rather than by mechanical limitations. There is a mechanical limitation, however, to how close you can place the two marginal stops on the marginal scale—the limitation is one and one-half inches. To obtain a column width smaller than 1½ inches (9 picas), follow these steps:

1. Set marginal stops 1½ inches apart (4½ and 6).
2. Bank carriage, press 1/3 spacer twice, and bring marginal pointer up to white mark on dial.
3. Type a line of 1's to determine how many increments there are in the 1½ inch width. Always type 1's in groups of nine or less to make them easier to count.

Example: III III III III III III III III (37 1's or 74 increments)
III III III III III III III III III (35 1's or 70 increments)

4. Determine the number of increments in the desired column width (under 1½ inches) by using the DSJ scale.
5. Subtract the number of increments in the desired column width from the number of increments obtained in the 1½ inch width.
6. Using the 1/3 spacer, space in the number of increments necessary to reduce the 1½ inch column to the desired width (step 5). Reset the marginal pointer by turning it clockwise up to the white mark on the dial. Type a line of tough copy.
7. Tab, press 1/3 spacer twice, move the outer rim marker so that it lines up with marginal pointer. Type justified line.
8. On each succeeding line, bank carriage, press 1/3 spacer until pointer lines up with white mark before typing rough copy line. Justified line typed the same as in step 7.

Example of narrow column width:

III III III III III III III III (34 1's = 68 increments)

7 pica width desired — 56 increments

JUSTIFYING COLUMN WIDTHS OVER 6 INCHES

Most column widths used in composition are under 6 inches. The reason for this is that the human eye finds a narrow column width of copy easier and quicker to read. The ideal column width is considered to be an alphabet and a half or 39 average characters. This means that ideal column widths range from 2 to 3½ inches. Notice the column width of copy used in magazines and newspapers. There narrow column widths are used so that the reading matter can be quickly read. Since the text of newspapers and magazines is usually dated (i.e., its importance dies quickly), it is necessary that the copy be presented in its most readable form. Novels and textbooks, on the other hand, are usually read more carefully and with greater concentration so that the column widths in this type of publication are wider (but still under 6 inches). Several factors should determine the selection of a proper column width — the page size to be used, the type of reading matter, and the type of reader for whom the copy is intended.

There are certain cases where column widths over six inches are necessary. These wider column widths are frequently used on insurance forms, legal contracts, trade bulletins, etc. For this reason the DSJ operator should know how to prepare copy in a wider column width.

The DSJ will justify automatically any column width up to 7½ inches in width. The only settings which need to be adjusted to produce a column width over six inches are the marginal stops and the tabulator stop.

For a 7½ inch width, set the right marginal stop at 7½ on the marginal scale and the left stop at zero on the scale. Then set a tabulator stop two notches away from 7½ on the tabulator scale. The tabulator stop should be in a position 8 notches to the right of 7 (6 notches to the left of 8). This will allow one pica (2/12ths of an inch) between the rough and justified copy. Other steps in justification are the same as previously described.

Width over 7½" up to 9½" can also be justified automatically. Note should be taken in reading these long lines that a paragraph of such length is more difficult to read.
The operation is a simple one. Actually it consists of double column work — but, with no space between columns. In linotype composition this would be called “butted slugs.” In other words, two linotype slugs butted together or placed end to end. The procedure is as follows:

1. Set stops (on rough copy side) for one-half of the width desired.
2. Type rough copy — tabulate — type final side. After typing last character — mark left dial pointer position.
3. Set a second tabulator stop just ahead of this position.
4. Type rough copy for second half of line. (Turn feed rolls back one click or insert another small piece of paper over rough copy of first half of line).
5. Tabulate to end position of first half of final copy — to mark on left dial. Type last half of line.

There are a few do’s and don’ts in the method, as follows:

**YOU MAY**
1. End first half of line in the middle of a word without regard to syllables.
2. End first half of line with a space following a completed word.
3. End first half of line with a completed word.

**BUT REMEMBER**
1. In this case, do not hit space bar at beginning of rough copy side of second half of line. Type the first word of this second half of line, and then hit space bar twice. After tabulating space can be put in proper place.
2. Try to have right dial pointer stop at about the same place for both halves of line. This will keep word spaces even.

---

**MANUAL JUSTIFICATION**

When copy is to be justified manually, it is necessary to prepare rough copy in advance. This enables an operator to know whether a line is to be stretched or condensed and exactly how much to add or subtract from a line to justify it. If you learn to prepare near rough copy, it will be very easy to type the justified copy. Following are the steps for preparing manually justified copy:

1. Set marginal stops the desired width apart. The stops do not have to be set at the left end of the marginal scale; they may be placed near center on the scale so that the paper will be used in the center of the carriage. **Example:** For an 8 inch column width, set the right stop at 12 and the left stop at 4 on the marginal scale.

2. Type a test line to obtain the exact number of increments desired in the column width. Although the DSJ scale gives the correct number of increments for a column width only up to six inches, simply take the number of increments to one inch and multiply by the number of inches in the desired width. **Example:** At B spacing, there are 43 increments per inch; therefore there are 344 increments in an 8 inch width. Adjust the test line to the proper number of increments (see Justification Using DSJ Scale).

3. While carriage is near right marginal stop (when typing test line) and justifyer dial pointer is at zero, see if justifyer pointer is exactly on zero. If it seems to fall between 1 and zero so
that it is difficult to read, turn the adjuster knob (at left end of paper basket) slightly. This will move the justifier pointer and enable you to align it exactly with zero on the scale.

**Note:** This adjustment is important, because we want to read the position of the justifier pointer at the end of each line. If the pointer is not properly aligned, it will be difficult to determine the proper reading of the dial. This adjustment may also be used in automatic justification in order to read the dial more accurately.

4. Type the rough copy. On each line watch the justifier pointer as it nears zero. If the line is a few increments short, type the number of increments short in the margin, preceded by a minus sign to show the line is short by that number of increments. If the line runs beyond zero, type the number of increments over zero in the margin to indicate that the line is too long by that number of increments.

**Example:**

```
mmmmmmmmmmmmmmmmmmmmmmmmmm
```

Newspapers can now be produced more cheaply than before. Books can be made available more quickly and at a lower cost to the public. It can be Type the justified copy. At places where space is to be added, press the space bar and then the 1/3 spacer once to add an increment. Where space is to be removed, press the space bar and then the 1/3 back spacer once to remove an increment. This latter operation can be further simplified by pressing the 1/3 forward spacer instead of the space bar. The result is the same in either case, because pressing the space bar once produces two increments of space and the 1/3 back spacer removes one increment, whereas the 1/3 forward spacer produces one increment of space between words.

Manual justification is used for column widths over 7 1/2 inches, but it may also be used for copy which is to be justified on a paper plate or stencil since it allows for pre-typed rough copy with only the justified copy appearing on the plate or stencil. (Copy may also be justified on a plate or stencil by placing a sheet of paper at the side of the plate for the rough copy and then tabbing and typing justified copy on the plate or by ghost typing the rough copy.)

**CENTERING HEADINGS**

The preparation of a form is mostly a matter of considering the space allowed for the various items on the form; the proper arrangement and emphasis for the more important subjects, and type selection. All of these matters call for judgment and experience on the part of the operator. Forms vary considerably in type and style. However, there is one operational problem which is common to most forms—centering headings in preruled boxes.

**HORIZONTAL CENTERING**

The steps in centering a word or words horizontally in a box are simple if followed carefully:

1. Line up the ribbon shield pointer on the first line of the box.
2. Type heading with no typewriter (Ghost typing.)
3. Using space bar or 1/3 spacer, count increments until ribbon shield pointer lines up with second line.
4. Return carriage until ribbon shield pointer is again lined up with first line.
5. Space in half the increments left plus two increments.
6. Type centered heading.

**VERTICAL CENTERING**

The steps in centering a word or words vertically vary with the number of lines in the heading. Following are the steps for centering a single line heading, a two-line heading, and a three-line heading:

**Single Line Heading:**

1. Place a pencil dot at the center of the side of the box. (The dot will not reproduce if marked with the proper type of pencil - blue for photo offset or water soluble, or paper plate.)
2. Line up alignment guide slightly below side dot (one-half the height of the letter to be typed). Try the letter “H” in the margin. The cross-bar of the “H” should line up with the side dot.

3. Center line horizontally by above method. Type centered heading.

**Two Line Heading:**

The treatment of two-line headings varies according to whether 2 or 3 clicks are used between lines. Since most of the Var-i-Line gears require 2 clicks between lines, we will list the steps for a 2 click heading first:

1. Place a pencil dot at the center of the side of the box.
2. Line up alignment guide as for a single line heading.
3. Move up one click and type top line.
4. Move down 2 clicks and type second line.

To center a two-line heading with 3 clicks between lines:

1. Place a pencil dot at the center of the side of the box.
2. Line up alignment guide so that center dot rests on alignment guide.
3. Move up one click and type top line.
4. Move down 3 clicks and type second line.

**Three Line Heading:**

A three-line heading is centered in the same manner as a single line heading. The only rule to remember is to center the middle line first, then move up or down for the other two lines.

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**TABULAR OR STATISTICAL COPY**

Tabular copy is considered to be any copy which consists of columns of names or figures or a combination of the two. Price lists, time schedules, catalog pages, rate sheets are a few examples of this type of copy.

The main considerations in preparing tabular copy are the allowance of adequate space for each column and space between columns, the proper arrangement of columns so that the important ones will be emphasized, and the establishment of definite starting points for each column and the column headings.

The DSJ is ideally suited to condensing large tables to a size of page that is easier to handle and to file without sacrificing clarity. The use of contrasting types and white space creates a table which is easier to read even when smaller types are used.

The steps in preparing a statistical page are listed below:

1. Count the number of increments in the longest line in each column. Be sure to consider both the column of names or figures and the column heading. The longest line in a column of figures is usually in the total row.
2. Total the number of increments to be used in each column. This is the total amount of space which must be allowed for typed matter.
3. Select the copy width to be used for the table. This is usually the page width minus margins.
4. Select a spacing of type which will probably accommodate the copy and space between columns. At first this may be a guess. However, even a beginner can start by considering the widest spacing first, figuring to see if this spacing will work, then try the next spacing, etc., until she finds the spacing which will be adequate for the copy.
5. After the proper spacing has been selected, determine the amount of space to be allowed between columns. Then space out on the machine the amount of space to be allowed for each column, marking a paper dial (around the marginal dial) with a line and number showing the starting point for each column. This paper dial is a convenient device for marking starting point. To make a paper dial, cut a piece of paper 4 inches square. In the center of the square cut out a circle the size of the marginal dial and place paper square around the outside of the dial. Fasten to machine with Scotch tape.
Marks on the dial may be erased when the job is completed and the dial re-used. Plastic dials are available at nominal cost.

In order to better understand the method of setting up a tabular page it is best to try an actual practice example. Below is a sample of typewritten copy which we will plan for statistical layout on the DSJ.

<table>
<thead>
<tr>
<th>PERCENT</th>
<th>TOTAL</th>
<th>OVER 500,000</th>
<th>UNDER 100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. TOTAL</td>
<td>89.89</td>
<td>86,285,107</td>
<td>94,672,206</td>
</tr>
<tr>
<td>New England</td>
<td>32.45</td>
<td>10,416,677</td>
<td>21,177,776</td>
</tr>
<tr>
<td>Vermont</td>
<td>14</td>
<td>7,713,020</td>
<td>31,705,740</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>34.43</td>
<td>55,498,498</td>
<td>58,670,748</td>
</tr>
</tbody>
</table>

The first column in the above copy consists of names of states. The longest line is "Massachusetts". This line is 39 increments long. If we add a 2 space indentation for "New England" and another 2 space indentation for the states, we will be adding 4 average spaces to the longest line. Four average spaces equal 12 increments, so we must allow 50 increments for the first column. The increments allowed for all five columns are:

<table>
<thead>
<tr>
<th>Col. 1</th>
<th>Col. 2</th>
<th>Col. 3</th>
<th>Col. 4</th>
<th>Col. 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>28</td>
<td>25</td>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>

The total increments for the five columns is 143.

Suppose this copy is to be placed in a 23 pica column width. At B spacing there are 163 increments in a 23 pica width. This would allow 20 increments of space to put between columns or an average of 3 increments between each pair of columns. This sounds like a lot of space, but remember that 5 increments are really less than 2 average spaces. It is best, if possible, to have a minimum of 2 average spaces between columns of figures to avoid confusion of columns. At C spacing there are 181 increments in a 23 pica width. This would allow 38 increments to divide between columns - an average of 9 increments (3 spaces) between columns. The two extra increments might be placed between the first and second columns.

Our final layout for the tabular copy is this:

<table>
<thead>
<tr>
<th>Col. 1</th>
<th>Col. 2</th>
<th>Col. 3</th>
<th>Col. 4</th>
<th>Col. 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>31 - 11 - 28 - 29 - 25 - 19 - 20 - 19 - 20</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(italic numbers are increments between columns.)

To space this out on the machine and mark dial, set marginal pointer to zero dial and mark starting point for first column. At the same time you might space in and mark the starting point for the geographical district (New England) and for the states. These marks can be indicated as 1A and 1B starting points. Return to starting point and space 25 times with space bar (50 increments). This will give the position for the end of column one. Sometimes the end position of a column is marked (1E or any other significant notation) so that a heading may later be centered over the column. Then space 11 increments (5 times with space bar and once with 1/3 space) and mark starting point of second column. Since the heading is the longest line in the second column and the longest line of figures under it equals 14 increments, space in 7 increments and mark starting point for figures. (Heading is 28 increments; figures are 14; difference is 14 increments; half of 14 is 7.) Following this pattern and the above layout, space out and mark starting points for other 3 columns.

The planning of copy and the marking of starting points require a little time, but it is time well spent and actually time saved in the typing operation. Once the starting points for all columns are marked, it is easy to move from one column to the next. Very often you will be able to line up the figures or columns by eye, but you have the added assurance of being able to glance at the marginal dial pointer and know that you are perfectly lined up for each column.

The method of establishing starting points for columns described here apply to the regular DSJ. On the DSJ Forms Design Machine there is another device for accomplishing the same thing. This is described in the DSJ Forms Design section.

**LEADER LINES**

In tabular copy it is often difficult for the eye to travel across the page and pick up the correct figures for a particular line. This is particularly true when the length of figures in the first column vary considerably in length. To overcome this problem printers use a dotted line from the end of each copy line over to the figures which apply to the particular line of copy. These dotted lines are known as leader lines because they lead the eye across the page to the proper row of figures. Leader lines are very popular and useful. They are used in statistical reports, on price lists, table of contents pages, and in many other ways.
COPY FITTING

It is usually necessary to plan copy so that it will fit a definite area of space. In order to avoid trial and error methods and retyping of copy, it is desirable to plan copy before it is composed so that it fits the proper copy area. Usually the copy is typed once on a typewriter so that author's changes and editing can be performed. It is possible, from the typewritten copy, to predict just how much space the typewritten copy will occupy when composed on the DSJ at a given column width and spacing. Page 54 is a chart for fitting typewritten copy on a DSJ. It is based on the same copy fitting method used in fitting regular printed copy from typewritten copy. The chart gives the average number of characters per line which will be obtained on the DSJ at varying spacings and column widths.

Following are the steps to follow in fitting copy to a definite amount of space:

1. Find the total character count of the typewritten copy.
   a. Find the average characters per line.
   b. Find the total number of lines.
   c. Multiply the average characters per line by the total number of lines.

2. Select a column width and horizontal spacing. (Column width may already be specified.)

3. Find the average number of characters per line on the DSJ. (See copy fitting chart.)

4. Find the total number of lines if prepared on the DSJ at given column width and spacing.
   a. Divide the total character count by the average characters per line.

5. Divide the length of copy (in inches) into the total number of lines (when copy is prepared on DSJ). This will give the vertical spacing necessary to use (in terms of lines per inch).
   a. See Chart II for proper gears and number of clicks

6. Find the necessary point size gear to be used. (Divide 72 by the lines per inch.)

7. Compare the point size gear to be used with the point size of type selected. If the type size is larger than the gear size, a smaller type size must be selected and the copy fitting problem reworked.

There are two types of leader lines used on the regular DSJ - solid leader lines (with no space between dots) and letterspaced leader lines (with spaces between dots). In either case it is necessary that the dots line up - underneath each other and at the end of the line. If a line is typed and the dots started right after the copy, and if this procedure is repeated on each line, there is no assurance that the dots will line up at the end of the line. This is due to the fact that the first line typed might have, for example, 63 increments in it. The next line of copy might have 48 increments. Therefore, if the dots are started right after the copy in each case, they will not line up because each dot equals 2 increments, and in one case the dots are being started on an even increment (64th) and in the other case on an odd increment (69th).

To correct this situation and make sure that the dots always line up, follow these steps:

1. Solid Leader Line. (No space between periods or dots.)
   a. Type copy line.
   b. Return carriage to starting point.
   c. Space over copy line (with space bar) until ribbon shield pointer is beyond copy; type leader line.
   d. Do the same on each line and dots will line up (because space bar and period take the same number of increments).

2. Letterspaced Leader Line. (Space between dots.)
   a. Type copy line.
   b. Return carriage to starting point.
   c. Space over copy line (using space bar) until ribbon shield pointer is beyond copy; space in groups of two, e.g. one, two, one, two, etc.
   d. Start typing leader line after calling "two".
   e. Do the same on each line and dots will line up.

Another method of spacing over copy when a letterspaced leader line is to be used is to set the space adjuster lever on "large" when spacing over the copy. This eliminates the necessity of counting spaces. If this method is used, be sure to return space lever to "small" before typing leader line.
### Chart I - Copy Fitting Chart

<table>
<thead>
<tr>
<th>Column Width</th>
<th>Number of Characters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pica In.</td>
<td>A (12)</td>
</tr>
<tr>
<td>1</td>
<td>2.26</td>
</tr>
<tr>
<td>2</td>
<td>4.50</td>
</tr>
<tr>
<td>3</td>
<td>6.84</td>
</tr>
<tr>
<td>4</td>
<td>9.12</td>
</tr>
<tr>
<td>5</td>
<td>11.40</td>
</tr>
<tr>
<td>6</td>
<td>13.68</td>
</tr>
<tr>
<td>7</td>
<td>15.96</td>
</tr>
<tr>
<td>8</td>
<td>18.24</td>
</tr>
<tr>
<td>9</td>
<td>20.52</td>
</tr>
<tr>
<td>10</td>
<td>22.80</td>
</tr>
<tr>
<td>11</td>
<td>25.08</td>
</tr>
<tr>
<td>12</td>
<td>27.36</td>
</tr>
<tr>
<td>13</td>
<td>29.64</td>
</tr>
<tr>
<td>14</td>
<td>31.92</td>
</tr>
<tr>
<td>15</td>
<td>34.20</td>
</tr>
<tr>
<td>16</td>
<td>36.48</td>
</tr>
<tr>
<td>17</td>
<td>38.76</td>
</tr>
<tr>
<td>18</td>
<td>41.04</td>
</tr>
<tr>
<td>19</td>
<td>43.32</td>
</tr>
<tr>
<td>20</td>
<td>45.60</td>
</tr>
<tr>
<td>21</td>
<td>47.88</td>
</tr>
<tr>
<td>22</td>
<td>50.16</td>
</tr>
<tr>
<td>23</td>
<td>52.44</td>
</tr>
<tr>
<td>24</td>
<td>54.72</td>
</tr>
<tr>
<td>25</td>
<td>57.00</td>
</tr>
<tr>
<td>26</td>
<td>59.28</td>
</tr>
<tr>
<td>27</td>
<td>61.56</td>
</tr>
<tr>
<td>28</td>
<td>63.84</td>
</tr>
<tr>
<td>29</td>
<td>66.12</td>
</tr>
<tr>
<td>30</td>
<td>68.40</td>
</tr>
<tr>
<td>31</td>
<td>70.68</td>
</tr>
<tr>
<td>32</td>
<td>72.96</td>
</tr>
<tr>
<td>33</td>
<td>75.24</td>
</tr>
<tr>
<td>34</td>
<td>77.52</td>
</tr>
<tr>
<td>35</td>
<td>79.80</td>
</tr>
<tr>
<td>36</td>
<td>82.08</td>
</tr>
<tr>
<td>37</td>
<td>84.36</td>
</tr>
<tr>
<td>38</td>
<td>86.64</td>
</tr>
<tr>
<td>39</td>
<td>88.92</td>
</tr>
<tr>
<td>40</td>
<td>91.20</td>
</tr>
<tr>
<td>41</td>
<td>93.48</td>
</tr>
<tr>
<td>42</td>
<td>95.76</td>
</tr>
</tbody>
</table>

### Copy Fitting Chart

The five scales shown are for A (12), A (13), B, C and D Spacing. Each scale shows pica at the top, inches at the bottom and the number of characters of the particular spacing in between. At any given line length in pica, the graduation marks just below will show the number of characters of text matter which will go in the line at that particular spacing. As an example, with a 12 pica line (two inches) at A (12), 27 and a fraction characters; at A (13) 29½ characters; at B, 32½ characters; at C, 36 characters; at D, 40 and a fraction characters.

**Example of Copy Fitting Problem:**

Assuming that the copy consists of 18 typewritten lines of copy. Each line varies in length but the average length of line is 46 characters. To determine this measure an average line, you will see that it is one letter longer than 4½ inches. Since this copy is typed on a Pica typewriter at 10 characters per inch (measure an inch), this means that 4½ inches is equal to 45 characters. Add the one additional character and you have an average line of 46 characters.

The typewritten copy in this sample is to be fitted into a copy area 24 pica wide and 2.5 inches deep. Following the steps for copy fitting outlined above; we will attempt to fit the copy into the specified area.

1. Find the total character count:
   - 46 characters per line (average) x 18 lines equals 808 characters.
2. Column width is 24 pica. We shall try A spacing first.
3. Find average characters per line. According to the chart, a 24 pica width will have an average of 60 characters per line at A spacing.
4. Find the total number of lines if prepared on DSJ at A spacing.
   - 808 divided by 60 equals 13.4 lines or 14 lines
   (Since any fraction of a line will require vertical space, it is considered to be an additional line.)
5. Divide the length of copy in inches into total number of lines to find the vertical spacing (lines per inch).
6. Find the necessary point size gear to be used.
   - 72 divided by 6 lines per inch equals 12 point gear.
   - Or, refer to Chart II.
7. Compare the point size gear with the point size of type selected.
   - As a general rule, the horizontal spacing of a type has the following relationship to type size:
<table>
<thead>
<tr>
<th>POINT SIZE</th>
<th>NO. OF CLICKS</th>
<th>LINES PER INCH</th>
<th>MARKING ON GEAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>3⅛</td>
<td>1</td>
<td>22</td>
<td>13 pt</td>
</tr>
<tr>
<td>3⅜</td>
<td>1</td>
<td>20 ⅔</td>
<td>7½ pt</td>
</tr>
<tr>
<td>3⅝</td>
<td>1</td>
<td>19 ⅔</td>
<td>13 pt</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>18</td>
<td>Left Feed Roll Ratchet</td>
</tr>
<tr>
<td>4⅛</td>
<td>1</td>
<td>17</td>
<td>8½ pt</td>
</tr>
<tr>
<td>4⅜</td>
<td>1</td>
<td>16</td>
<td>7½ pt</td>
</tr>
<tr>
<td>4⅝</td>
<td>1</td>
<td>15</td>
<td>9½ pt</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>14 1/3</td>
<td>10 pt</td>
</tr>
<tr>
<td>5⅛</td>
<td>1</td>
<td>14</td>
<td>7½ pt</td>
</tr>
<tr>
<td>5⅜</td>
<td>1</td>
<td>13 ⅔</td>
<td>8½ pt</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>13</td>
<td>8 pt</td>
</tr>
<tr>
<td>6⅛</td>
<td>2</td>
<td>11</td>
<td>7½ pt</td>
</tr>
<tr>
<td>7</td>
<td>2</td>
<td>10 ⅔</td>
<td>7½ pt</td>
</tr>
<tr>
<td>7⅕</td>
<td>2</td>
<td>9 ⅔</td>
<td>7½ pt</td>
</tr>
<tr>
<td>8</td>
<td>2</td>
<td>9</td>
<td>Left Feed Roll Ratchet</td>
</tr>
<tr>
<td>8⅛</td>
<td>2</td>
<td>8</td>
<td>7½ pt</td>
</tr>
<tr>
<td>9</td>
<td>2</td>
<td>7 1/3</td>
<td>9½ pt</td>
</tr>
<tr>
<td>10</td>
<td>2</td>
<td>7 1/6</td>
<td>7½ pt</td>
</tr>
<tr>
<td>10⅔</td>
<td>2</td>
<td>6 ⅔</td>
<td>7½ pt</td>
</tr>
<tr>
<td>11</td>
<td>2</td>
<td>6 ⅝</td>
<td>10 pt</td>
</tr>
<tr>
<td>11⅝</td>
<td>3</td>
<td>6 4/5</td>
<td>10 pt</td>
</tr>
<tr>
<td>12</td>
<td>3</td>
<td>6</td>
<td>Left Feed Roll Ratchet</td>
</tr>
<tr>
<td>12⅛</td>
<td>3</td>
<td>5 2/3</td>
<td>8½ pt</td>
</tr>
<tr>
<td>13</td>
<td>4</td>
<td>5</td>
<td>9½ pt</td>
</tr>
<tr>
<td>13⅛</td>
<td>3</td>
<td>5 ⅔</td>
<td>10 pt</td>
</tr>
<tr>
<td>14</td>
<td>4</td>
<td>5 1/6</td>
<td>7½ pt</td>
</tr>
<tr>
<td>14⅛</td>
<td>3</td>
<td>5</td>
<td>9½ pt</td>
</tr>
<tr>
<td>15</td>
<td>4</td>
<td>4 8/9</td>
<td>7½ pt</td>
</tr>
<tr>
<td>16</td>
<td>4</td>
<td>4 ⅔</td>
<td>Left Feed Roll Ratchet</td>
</tr>
<tr>
<td>16⅛</td>
<td>5</td>
<td>4 ⅔</td>
<td>7½ pt</td>
</tr>
<tr>
<td>17</td>
<td>4</td>
<td>4</td>
<td>8½ pt</td>
</tr>
<tr>
<td>17⅛</td>
<td>5</td>
<td>4 1/3</td>
<td>7½ pt</td>
</tr>
<tr>
<td>18</td>
<td>4</td>
<td>4</td>
<td>9½ pt</td>
</tr>
<tr>
<td>19</td>
<td>4</td>
<td>3 ⅓</td>
<td>10 pt</td>
</tr>
<tr>
<td>20</td>
<td>4</td>
<td>3 3/5</td>
<td>10 pt</td>
</tr>
</tbody>
</table>

*Boldface shows Vari-Line gears at basic spacings.*

At the present writing this is a true scale of relationship with the exception of condensed types.

From the above chart we can see that the only A spacing type we can use is a 12 point size. Since this is no larger than the gear size, we could use this size type set solid. However, if we desired the copy to be leded, it would be necessary to select the next smallest spacing, B.

At B spacing, we would get 95 characters per line. Dividing into the total character count, we would get 13 lines of copy. Dividing 13 lines by 2 ⅔ inches would give a line spacing slightly over 5½ lines per inch. Dividing 72 by 5½ lines per inch would produce a 13 point size gear. Since B spacing types are either 10 or 9 points in size we could use a 10 point type with the 13 point gear and thus have 3 points of leading.

The final choice of type size, of course, depends on the desired appearance and availability of type style and size. Usually, however, it is desirable to have some leading on larger types to increase the legibility of the copy.

**DSJ FORMS DESIGN MACHINE**

The Forms Design DSJ is the most recent development of the Vari-Typer. It has proved to be a valuable contribution to the field of printing composition. This machine has all the features of the regular DSJ plus a device for ruling a variety of horizontal and vertical lines and producing vertically justified leaders. It can be used to compose forms complete with typography and lines ready for reproduction. In brief, it provides the most economical and fastest means of composing forms, price lists, and tables—the most costly kinds of letterpress composition.

### BASIC PARTS OF THE FORMS DESIGN DSJ

**Type.** The type is the regular DSJ type with three characters added on a segment in the center section (Plate II). All of the other characters remain intact. Single lines, scotch lines, double lines, dash...
leaders, period leaders, and many others are available on different segments. The top segment character is obtained by pressing just the control button; the middle segment character, by locking the capital shift key and pressing the control button; the bottom segment character by locking the figure shift key and pressing the control button. No key of the keyboard is used.

The type does not move in the machine when composing rules and leaders. In this way, precise alignment and accuracy are maintained for every forms character.

The segments available on Forms Design types are numbered with Roman numerals. A list of these segments appears below:

**FORMS SEGMENTS**

<table>
<thead>
<tr>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
<th>VII</th>
<th>VIII</th>
<th>IX</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Image of segments]</td>
<td>[Image of segments]</td>
<td>[Image of segments]</td>
<td>[Image of segments]</td>
<td>[Image of segments]</td>
<td>[Image of segments]</td>
<td>[Image of segments]</td>
<td>[Image of segments]</td>
<td>[Image of segments]</td>
</tr>
</tbody>
</table>

**ACTUAL SIZE**

<table>
<thead>
<tr>
<th>LOWER CASE</th>
<th>CAPITAL SHIFT</th>
<th>FIGURE SHIFT</th>
<th>USE</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Double Dot Leaders</td>
<td>Hairline</td>
<td>Parallel Rule</td>
</tr>
<tr>
<td>II</td>
<td>Double Hyphen Leaders</td>
<td>Hairline</td>
<td>Parallel Rule</td>
</tr>
<tr>
<td>III</td>
<td>½ point Rule</td>
<td>1 point Rule</td>
<td>General</td>
</tr>
<tr>
<td>IV</td>
<td>Hairline</td>
<td>Scotch Rule</td>
<td>General</td>
</tr>
<tr>
<td>V</td>
<td>Dot Leaders</td>
<td>Hairline</td>
<td>Blank (for tabulating)</td>
</tr>
<tr>
<td>VI</td>
<td>Hairline</td>
<td>½ point Rule</td>
<td>½ point Rule</td>
</tr>
<tr>
<td>VII</td>
<td>Hairline</td>
<td>½ point Rule</td>
<td>1 point Rule</td>
</tr>
<tr>
<td>VIII</td>
<td>Same as VII but enlarged for one-third reduction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IX</td>
<td>Single Dot Leader</td>
<td>Hairline</td>
<td>Parallel Rule</td>
</tr>
</tbody>
</table>

You will notice from this chart that although there is a maximum of three characters to each segment, there is such a variety of segments available that almost any combination of lines can be obtained. These segments are available on any desired type style at the time of purchase. Merely indicate the style number of type desired and specify segment.

**Paper Scale.** On the paper table of the machine is a tubular scale (Plate II) calibrated in inches and in each of the four DSJ spacings. By merely turning the knob at the end of the scale any selected scale becomes visible. Each of the spacing scales is marked in intervals of three increments. This is to conform with the width of each character on the Forms Design segments. Each individual character is three increments wide and when these characters are used, the machine travels three increments on each stroke of the hammer. This scale provides a control for line lengths and reference for starting and stopping points.

Attached to the front cover and near the anvil is an increment pointer which travels along the tubular scale during the typing operation. This pointer indicates the amount of space the carriage has traveled in terms of increments. It may be moved back, away from the scale when not in use.

**Control Buttons.** The only control used in operating the Forms Design attachment by ruling is the small control box at the right of the machine (Plate II). The left push button controls the automatic, rapid impressions which form a continuous ruled line; the right push button produces single strokes used in the control of line lengths for accurate registration.

**Line Stops.** Line stops are provided to control the length of lines automatically. These stops consist of a thumbscrew clamp which fits over the marginal scale at any desired position. They are independent from the teeth of the marginal scale so that they can be placed in any desired position to stop lines within the smallest fraction of an inch. A small projection on the stop causes the carriage to stop at the proper place when the repeater control button is being operated. It does not affect the travel of the carriage for other typing. These line stops are convenient to use whenever many lines of the same length are ruled. Whenever it is necessary to continue a line beyond the line stop, merely press the single stroke button a few times and return to the repeater button for the automatic, continuous line.

**DEFINITIONS OF TERMS USED IN FORMS DESIGN**

- **Period Leader**
- **Dash Leader**
- **Hairline rule**

Solid rules (½, 1, 2 points)
Double hairline rules (on 2 point body)
Scotch rules

Box head—Copy should be centered horizontally.

This is a sample of the hanging indentation style.

Hanging indentation—Reverse of normal indentation used and preferred in forms, charts, and tables.

Lamp
Table
Desk
Chair

Stub—The first column of some tabular jobs consisting of words and leaders to the first vertical rule.

STOPPING OR STARTING Ruled LINES

Although the line stops will stop lines automatically, it is sometimes necessary to carry a ruled line to a slightly more precise stopping point (as in a case where a rule precedes typed copy or a horizontal and vertical rule are to be joined). In this case the length of line between pre-determined points is controlled by back-spacing and overlapping the last character to obtain a shorter length than the 1 increment character. In this way variations of 1 increment can be made. At the 4 DSJ spacings the value of one increment is:

A .0255"  C .021"
B .023"   D .018"

1 point is .0138"

VERTICAL RULES

Vertical rules are obtained by placing paper, plate, or stencil in machine at right angles. Now, the horizontal rules of the form become vertical rules. It is necessary that these rules are perfectly straight vertically, or the horizontal lines you are about to type will not join properly. Use this method of insuring exact alignment. Align shield pointer on any vertical rule and start turning feed rolls. When line remains centered on pointer while feed rolls are rotated, it is at exact right angles. If it goes to one side, loosen feed rolls and move paper sufficiently to correct. This assures perfect butt joints throughout the entire copy and eliminates the need for moving the carriage back and forth until copy is aligned.

BUTT JOINTS AND CROSS RULES

These are accomplished by employing overlapping as described above. Practice so that you are exactly familiar with the relation of the shield pointer and alignment guides on your machine. This is vital in order to obtain perfect joints. Extra thought should be given to double and scotch rule joints.

DIAGONAL RULES

Diagonal Rules (very costly in LP composition) are also simple. To get perfect joints do it this way after finishing all horizontal and vertical rules.

1. With ruler mark reference points.
2. Align reference points against line guide.
3. Rule diagonal.

(Diagonal required in this box.)
LEADER LINES VERTICALLY JUSTIFIED

In the Leader Line section of the manual we described one method of vertically justifying the leaders lines. This can be handled more simply on the Forms Design DSJ. By using the calibrations on the paper scale, the rule or leaders can be aligned directly under a previous line (important for indexes, tables, price lists, time tables, etc.). Alignment is accomplished by checking the paper scale with the pointer. After typing the necessary copy or typed matter, look to see how the increment pointer is positioned on the scale.

1. If pointer is on a line - start the leader line.
2. If pointer is not on a line, use the 1/3 spacer once or twice to bring the pointer on a line. Start the leader line.
3. When pointer is on a line at the starting position, it will be on a line when you stop the printing of leaders or lines.
4. Marks made with a grease pencil on the paper scale serve as handy, removable reference points. (These "China Marking" pencils are available in most stationery shops.) When using the paper scale, always be sure the proper scale is being used - B scale if machine is set at B spacing, etc.

TABULAR OR STATISTICAL COPY

The planning of tabular or statistical copy was previously described for the regular DSJ. On the Forms Design machine, though the planning of statistical copy is primarily the same, the actual typing operation is greatly simplified. Instead of using a paper dial around the marginal dial to indicate the starting points for various columns, it is now possible to use the increment scale and pointer for this purpose. If possible, try to plan the columns so that each column will start on a particular mark of the increment scale. All that is necessary is that the amount of space allowed for each column be divisible by three. Then each column will start on a line of the scale because the scale is marked in intervals of 3 increments. Note these starting points on a sheet of paper when setting up the copy or mark starting points on scale with "China Marking" pencil. After the first few lines are typed, eye alignment plus the alignment on the paper scale will be all that is necessary.

There is another device for simplifying the typing of tabular copy. If the type used for the copy has no forms design segment, it is possible to move the carriage quickly from one column to the next by pressing the repeater button. Since there is no segment on the type, nothing will appear on the paper until you reach the next column and type copy. Occasionally, the type number may leave a mark on the paper when this method is used. If this happens, your local service representative can correct this for you. If you plan to do a volume of tabular copy, there is a segment available which has a character on two rows but no character on the third row. This segment has been designed expressly for the purpose of doing tabular copy in the manner just described.

The line stops may also be used to facilitate the handling of tabular copy. These stops, properly placed, will stop the carriage at the starting positions of various columns.

PREPARATION OF FORMS

Since there is such a variety of forms which can be composed on the Forms Design DSJ, it would be almost impossible to describe rules for each type. Each form is different, requiring different measurements, etc. Remember to make the most use of your Vari-Line gears. These gears will enable you to place lines at any desired position or interval. Practice the simple operations of joining horizontal and vertical lines, stopping and starting lines at definite positions, etc. Soon you will master the Forms Design attachment and be able to produce attractive, printed forms.

Carriage Rack Actuating Bar Lock

The Carriage Rack Actuating Bar is the Long Bar extending the length of the carriage, located at the rear of the machine. Using the space bar, after tabulating causes the Carriage Rack Actuating Bar to drop into a downward position, creating large carriage motion and uneven spacing. Complete re-banking of the carriage is necessary to reset the actuating bar.

The attachment consists of a slide mounted with two screws at the right end of the carriage rack actuating bar. The slide is kept to the right, when using the justifying mechanism, and moved to the left for tabular copy. It is in this position that the actuating bar is locked up. This prevents the space bar from giving large carriage motion (or space) when the tab key is depressed.

In spacing over from one column to the next, the space bar is used. It is also possible to use the Carriage Release Lever to move the Carriage across the page, stopping at each column. Marking on the Plastic Dial Ring indicates the various carriage positions as indicated by the Marginal Dial Pointer.
THE COMPOSOMATIC

The Composomatic is the latest model of the Coxhead DSJ and DSJF. Many features have been added to this model which make the operation of the DSJF simpler and more automatic. Anyone having previous experience on the DSJ or DSJF will find their adjustment to the new Composomatic an easy one to make, and any new operator will find the Composomatic a machine that is simple to learn.

The operational improvements on the Composomatic will be discussed in the first section of this supplement; applications of these features to actual composition problems will be described in the second section.

NEW FEATURES

Color and Appearance: The new Composomatic can easily be distinguished from the former DSJ models by its attractive tan color and cream and green accents. It has the same crinkle finish of former models, and this same finish is now used on the paper guides in addition to other parts of the machine. Green plastic keys form the basic section of the keyboard; auxiliary keys are made of a light, cream-colored plastic, making it easier to distinguish these keys from the main keyboard. Cream-colored dials, feed roll knobs, and anvil knob are easy to see and handle. All of the appearance factors of the Composomatic have been designed not just to add to the beauty of the machine but also to reduce light glare and strain of the operator.

Type Insertion: The Composomatic Model has no type change key. To insert or remove types, simply lift the anvil knob and swing the anvil one quarter-turn. The anvil will click into position and you can then insert or remove two types at the same time. The anvil knob is made of cream-colored plastic and is enlarged to make it easier to grasp.
Impression. There are seven impression settings on the Composomatic. The former models had four variations of impression. The new settings provide for half-step progressions as compared to the previous models. One, three, five, and seven on the Composomatic are comparable to one, two, three, and four on the former DSJ. Settings at two, four, and six on the new lever would be equivalent to $\frac{1}{10}$, $2\frac{1}{2}$, and $3\frac{1}{2}$ on the old machine. This greater variety of impression settings will enable you to set the precise impression necessary for any type, whether it be a bold heading type or a fine ruled line on a form.

On previous models the impression setting was affected by the horizontal spacing used. Four impression at A spacing, for example, was heavier than 4 impression at B, C, or D spacing. On the Composomatic the spacing and impression settings are completely independent of each other.

There is another feature of the Composomatic which is directly related to any discussion of impression. This feature is a special suppressor for the period, comma, and hyphen keys. The suppressor reduces the hammer blow on these small characters and prevents them from cutting into paper or paper plates (mats), regardless of what impression setting is used. This device solves a great problem which used to exist when copy was composed on paper plates. These small characters (period, comma, and hyphen) always received the same blow from the electrically controlled hammer as did larger characters. This caused those small punctuation symbols to emboss on direct offset plates. These embossures were deep impressions in the plate to which the offset ink could not penetrate. The resulting copy had circles where solid periods belonged and showed only

the outline of commas or hyphens. Lowering the impression setting to these symbols helped to reduce the embossures but did not eliminate them entirely. The suppressor not only eliminates these embossures but it does so automatically.

Vertical Spacing. The Composomatic has a special Automatic Paper Feed Lever which eliminates the use of Vari-Line gears entirely. At the left end of the carriage is a semi-circular dial with 1/10 point graduations on it, ranging from 0 to 18 points. A chrome-plated indicator shows the setting of the lever at any particular time. Above the indicator is a knob which is used to set the indicator at any desired position. Pull up on the knob and move the indicator to the proper setting.

Behind the dial is a long lever, this is the Automatic Paper Feed Lever. Once the lever is set to feed a particular number of points, simply push this lever to the left, and the paper will move up the required amount of space. For example, if you are using a 10 point type, and you want one point of space (leading) between lines, set the paper feed indicator at 11 (10 plus 1). After completing the first line of copy, return the carriage and push the feed lever to the left. You are now ready to type the second line of copy. Repeat this procedure on each successive line, and you will have copy that is automatically leaded one point.

One of the great advantages of the automatic paper feed is that it is possible to change from one setting to another by merely moving the indicator. For example, if there is a subheading in the copy and you want to place more space around it, you merely move the lever to the desired setting. Let us say that we have a 10 point subheading and we want 7 points of space above and 4 points of
space below the heading. We would set the lever at 17 (10 plus 7 points of leading) and push the paper feed lever. Then we would type the heading, set the indicator for 14 (10 for the text copy type plus 4 points of leading) and push the paper feed lever to the left. We would then be ready to type the first line of text copy. By resetting the indicator to 11 we can resume the composition of the text copy, using a 10 point type and automatic leading of 1 point between lines of the text matter. To obtain the same results as above on the former DSJ, it would have been necessary to insert and remove four Vari-Line gears! It is easy to see how much time and effort the Automatic Paper Feed Lever saves the operator.

In addition to the Automatic Feed Lever there is a permanent two-point gear fixed on the right end of the carriage where the Vari-Line gears were formerly inserted. This gear is engaged in the same manner as the former Vari-Line Gears—by pushing the detent spring lever down. It is disengaged by pushing the same lever straight out in back. Care should be taken when first engaging this lever that the detent roller falls between two gear teeth. It is only necessary to move the right feed roll knob slightly to engage the roller, as the teeth of the gear are close together. When using this two-point gear, you must disengage the Automatic Feed Lever. To disengage this lever, push the left feed roll knob in and turn it backwards. To engage the lever, push the left feed roll knob in and turn it forward.

The two-point gear is used mostly in forms composition, where it is frequently necessary to move the paper up and down in the feed rolls. Most forms are planned in two-point multiples—i.e. 2, 4, 6, 8, 10, or 12 point spacings. Forms that are designed in 12 point ver-

dial spacing are easily filled in on a typewriter; consequently, many forms are designed on this basis.

Where the copy will be fed up in the machine continuously, as in text copy for booklets, manuals, pamphlets, tabular material, or simple forms, etc., it is advisable to use the Automatic Feed Lever.

Alignment Guides. The Composomatic has transparent plastic alignment guides with a hairline rule through the guide. All copy lines up on the hairline rule, giving the operator a precise guide for aligning copy. Should it be necessary to move the paper down in the machine when using the Automatic Feed, simply disengage the automatic feed and re-align copy by means of the hairline rule on the alignment guide.

Margin and Justifier Dials. The margin and justifier dials have been converted to cream-colored plastic with green lines and figures. The left (or marginal) dial has four concentric circles printed on it. The dial pointers on both dials are green plastic. Pencil marks can be placed on the marginal dial and easily removed, eliminating the need for any outer ring marking. Each circle may be used for one revolution of the pointer. For example, the first ring represents the first revolution of the pointer and any marks placed on the first ring represent positions as the pointer revolves for the first time around the dial; marks on the second ring represent positions on the pointer's second revolution around the dial, etc.

The rim indicator is flat with an extension above the edge of the rim which permits finger-tip control of the movable outer rim.

Keyboard. The keys on the Composomatic are modified rectangles with depressed tops. They fit your fingertips and eliminate fingers slipping off the keys.
Horizontal Planning Scale

The keys of the main keyboard are green, and the top of each key consists of a clear piece of plastic bearing the character designation of the key printed in white. The key tops clip over the keys; thus they may be removed or changed when another keyboard arrangement is desired (as in the use of foreign types).

The auxiliary keys, such as the Repeat Key, Figure and Capital Shift Keys, etc., are cream-colored with clip-on key tops printed in green. This color arrangement eliminates any confusion between the main keyboard and auxiliary keys.

The 1/3 spacer is now designated as the 1 increment spacer and is marked "1 inc." The other increment keys are marked "3 inc back" and "1 inc back."

The top of the type drawer is painted green to eliminate any glare under the green keyboard.

Horizontal Planning Scale. The tubular scale of the former DSJP has been replaced by a flat Horizontal Planning Scale. The Planning Scale is cream-colored plastic with green markings. Each inch is equivalent to three increments or one segment stroke of the form control button. The Planning Scale is actually four scales in one, having one scale on each edge, front and back. The four scales correspond to the four horizontal spacings: A, B, C, and D. The Planning Scale can be removed from the machine and placed directly on the copy to plan a composition job.

A green metal slot, fastened to each end of the paper table with chrome-plated thumbscrews, acts as a holding device for the Planning Scale.

Gun Sight Indicator. An indicator, similar to the ones used as gun sights to locate a target, is placed directly in front of the Forms Planning Scale. The indicator is fastened to the machine at the left side of the anvil. The arm of the indicator curves over the anvil so that the gun sight is in front of, and above the anvil. Since the sighting device is flat against the Horizontal Planning Scale, you can easily read any number on which the hairline of the gun sight falls. The arm of the indicator can be moved forward or back, and when you push it forward, it clicks firmly into position. There are two thumbscrews at the left of the indicator arm. These thumbscrews are used to adjust the indicator so that the hairline of the gun sight rests directly on a line of the Horizontal Planning Scale. To make this adjustment, loosen the left knob; then turn the right (or inside) knob until hairline falls directly on line of Scale. Then lock the indicator in this position by tightening the left (or outside) knob.

Centering Scale. A transparent plastic centering scale slips over the Horizontal Planning Scale. The Centering Scale has a 0 (or center position) which may be aligned with any mark on the Horizontal Planning Scale and used to center headings. The Centering Scale is calibrated so that the distance between numbered calibration marks left of center position is exactly half of the distance between the numbered calibration marks located right of center position. (For example, the distance from 0 to 10 right of center is twice the distance from 0 to 10 left of center.)

To center a heading, using the Centering Scale:

1. Move the center position (0) of the Centering Scale so that it coincides with the hairline on the gun sight indicator.
2. "Trial type" the heading and read the position of the gun sight hairline on the Centering Scale. For example, let us say that the hairline stops on 24.
3. Return the carriage to a position where the hairline falls on the same number LEFT of 0 (or center).
4. Type the heading and it will be automatically centered. (In the above example, you would locate the hairline on 24, LEFT of 0.)

Non-Print Key. In the above paragraph we mentioned “trial typing” of headings. On the former DSJ and DSJF models, it was necessary to remove the type from the anvil in order to trial type. The new Composomatic has a special Non-Print Lever which will enable you to trial type a heading without removing the type. This lever or key is located at the right end of the keyboard. To trial type a heading, move the lever up (away from you) for non-print. For regular typing, move it down for print.

Removable Code Bars. In every DSJ or DSJF is a set of Code Bars which control the number of increments each key of the keyboard takes when you are typing. These code bars operate automatically, moving the carriage 2 increments if you strike a two-increment character, three increments for a three-increment letter, etc. On former models these code bars were built into the machine and could not be removed. This created a problem, particularly where foreign language types were being designed, because additional characters or accented symbols could be placed only on a few keys; for example, an accented o could not be placed where a comma was; because the comma took only 2 increments and the accented “o” required 3 increments.

Now the code bars can easily be removed for any foreign language type or for any special English type. At the right of the Composomatic is a slide lever which may be pushed in or out to change from Standard to Differential Spacing. This lever replaces the round knob found on former models. To obtain Differential Spacing, push the lever in; to obtain Standard Spacing, pull the lever out. This lever is also used when inserting or removing a set of code bars.

To remove code bars:
1. Remove front cover.
2. Pull the Slide Lever out (as for Standard Spacing).
3. Lift the “balls” that rest on the code bars.
4. Lift out the code bars, using the small levers at each side of the code bars.

To insert a new set of code bars:
1. Place new set of code bars in machine.
2. Snap code bars firmly in place.
3. Drop the balls over the code bars.
4. Push the Slide Lever in.
5. Replace front cover.

In addition to allowing more versatility in foreign language type design, there is another advantage of having removable code bars. When the code bars are in the machine and the Slide Lever is out, all characters take three increments. This is known as Standard Spacing, and this setting is used whenever standard types are used on the DSJ or DSJF. If, however, the code bars are removed, and the Slide Lever pushed in, all characters take two increments. Thus you can use a small type such as the standard type 250-2 (of the Standard Copper Plate Gothic Series) at spacings as close as 24 characters per inch! This is a special advantage in form composition where it is often necessary to get a lot of copy into a small block of space. It is also possible to have a Copper Plate...
Gothic series on the Composomatic which has two sizes of caps on the same type. This was not possible on the former models because of the variation in increment spacing of letters on the lower case row of the type. In brief, the feature of Removable Code Bars further increases the variability of type designs and type combinations on the Composomatic.

APPLICATIONS OF THE COMPOSOMATIC

There are many applications of the Composomatic. It can be used for text copy of magazines, newspapers, booklets, pamphlets, etc. Tabular material, catalog pages, and copy of any form can be composed on this machine. The most important improvement, however, has been in the field of Forms Designing. In order to acquaint you with the proper procedure in designing a form on the Composomatic, we are going to plan and compose a simple form which you can try on your own machine. Once you have mastered the simple steps involved, you will find that you can compose any kind of form on your Composomatic simply and easily.

Planning. The most important factor in any composition job is the planning that is done before you type a line of copy. Too often, in an effort to save time, we start to compose a job that is only half-planned or, worse, not planned at all. When we get half-way through the job we find we have mis-calculated, so we must throw away the page and begin again. Experience has proved that failure to plan a job completely is always more time-consuming than if we had started the job with all the copy properly planned and marked.

The form shown on the opposite page is a simple one in rough pencil draft. That is the way most forms are presented to the Vari-Typist. You will notice pencil markings on the form which represent the markings of the operator as he plans the job. Everything should be marked on the copy, and it is even wise to use a different colored pencil to represent different types of marks. For example, you might use red for horizontal planning marks; blue for vertical markings, etc.

The steps listed below represent the various stages of planning and composing a simple form:

1. Horizontal Planning.
   A. Remove the Horizontal Planning Scale from the machine by loosening the thumbscrews at each end of the paper table scale hanger. Lift it out.
   B. Turn the scale so that the "C" scale is on the upper top side and place it on the layout of the form to be composed.
   C. Mark the scale with a pencil to show the following points:
      1. Left side.............50
      2. Vertical rules.........64, 78, 140, and 154.
      3. Right side.............160
      4. Center of form...........105
         a. Form is 110 "C" units in length
            (106-50+110)
         b. One-half of 110 is 55. Add this to the starting point (50) to get center of form on the scale (50+55=105).
   D. Slip the transparent Centering Scale over the Horizontal Planning Scale with "C" on one scale matching "C" on the other. Then place the two scales back in machine and tighten thumb screws.

2. Vertical Planning.
   A. Set heading in 660-10B type, letterspaced 2 increments between letters and 6 increments between words. (The form is planned at C spacing. Rather than change to
B. Spacing for just one line, it is wise to leterspace it as suggested, thus eliminating any need to change spacings.

C. Put 1 point of white space between the top one-point rule and the main heading.

D. Put 2 points of white space between the top one-point rule and the boxed heading (top of the heading).

E. Put 3 points of space below the 8 point boxed heading type (No. 669-8C). (Above second one-point rule).

F. Put 18 points of space between horizontal baseline rules.


A. Replace Horizontal Planning Scale in machine.

B. Set left marginal stop and blank carriage to left side of form.

C. Press 1 increment spacer once or twice and adjust gun sight indicator to align with 50. Adjust indicator by means of adjustment knobs described under Gun Sight Indicator.

D. Insert sheet of composition paper and close feed rolls.

E. Using carriage release lever, move carriage so that center of form (105) is aligned with gun sight indicator.


A. With pointer at center of form (105), slide transparent Centering Scale so that "0" of Centering Scale is over 105.

B. Move Non-Print lever back toward carriage to Non-Print position.

E. Type heading, inserting 2 increments between letters and 3 increments between words. The indicator stops at 12 on Centering Scale. Heading measures 15 units.

D. Move carriage back to 15 position left of "0" on Centering Scale.

F. Pull Non-Print Lever forward to Print position.

5. Set Paper Feed.

A. Engage Automatic Feed Lever.

B. Move setting lever to 8 points (the amount of white space under main heading of form).

C. Move feed lever to left as far as it will go and release.

6. Ruling Top Line.

A. Using Segment III, cap shift, rule top line (one-point rule) from 50 to 160.

B. Cut-off stop should be placed on marginal scale to cut off forms attachment at 160.

7. Set Paper Feed.

A. Change setting lever to 12 points (to allow for 4 points above heading plus the 8 point height of the boxed heading type).

B. Push Automatic Feed Lever to left.

II. Centering Boxed Headings.

A. Set zero of centering scale at center of first box (57). First box extends from 50 to 64 on Horizontal Planning Scale, 64-50=14 forms units in first box. One-half of 14 is 7. Beginning of box (50) plus 7 equals 57 as center position of box.

B. Push lever to Non-Print position and type "NUMBER" using 660-8C type. Gun sight indicator stops at 6.

C. Move carriage to left of zero until 6 is aligned with indicator.

D. Push lever to Print position and type heading.

E. Set zero of Centering Scale at center of the second box (71).

F. Push lever to Non-Print position and type "ITEM;" Gun sight indicator stops at 3½.

G. Move carriage to 3½ left of zero.

H. Push lever to Print position and type heading.
I. Set zero of Centering Scale at center of wide box (109). Type word "DESCRIPTION" with lever in Non-Print position.

J. Indicator stops at 9%. This can be considered 10, for purposes of centering. Move carriage to 10 at left of zero. Set lever to Print position and type heading.

K. Set zero of Centering Scale at center of last box (150). With lever in Non-Print position type the word "PRICE:" Pointer stops at 4½.

L. Move indicator to 4½ left of zero. Change to Print position and type heading.

   A. Reset Feed Lever to 0 points for white space below boxed head.
   B. Push feed lever to left as far as it will go.

    A. Reset carriage to starting position (50).
    B. With Segment III, cap shift, rule one-point rule under boxed heads. Cut-off switch will stop machine at 160.

    A. Form requires 16 entry lines in 4 inches. This is 4 lines per inch. Setting the Feed Lever to 16 points, we will get 4 lines per inch.
    B. Push feed lever as far as it will go and release.
    C. Rule line using hairline rule on cap shift of Segment I.
    D. Repeat above procedure until 16 lines have been ruled.
    E. Release feed rolls and take paper out of machine.

    A. Remove Horizontal Planning Scale and place it over form so that 50 on scale lines up with left edge of form and 160 lines up with right edge of form.
    B. Using a blue pencil, mark a thin, short line at 64, 78, 140, and 154 on the form. (The form should have no rules at left and right sides.)
    C. Place typed copy back in machine so that horizontal lines are now in a vertical position.
    D. Align edges of ruled lines with alignment guides and close feed rolls.
    E. Roll paper up until first blue pencil line is aligned on hairline of alignment guide.

8. Rule vertical line, using the hairline rule (cap shift of Segment I).

9. Repeat procedure at other blue pencil lines.

10. Form is now completed.

SUMMARY

The purpose of this supplement has been to acquaint you with the new features of the Composomatic and apply some of these features to an actual composition problem. Study the description of the features of the Composomatic and try each one as you read about it. Then try the form we have described herein, following each step carefully. The knowledge you gain here plus the information on justification, and other mechanical features of the DSF and DSF described in the first section of the manual should enable you to master any composition problem you encounter.
The above scales conform to the figures on the Copy Fitting Chart (page 54). They show the number of typewritten characters you will average in every line of DSJ copy of a given column width. For example, if you plan to compose a column 2 5/8 inches wide with a C spacing type, you can look at the C scale (above) and locate 2 5/8 inches on the inch section of the scale. Above it you will see 45 which indicates that you will average 45 characters on every line of DSJ copy. Suppose the total character count of the copy is 468. Ten lines would contain 450 characters (45 x 10) and there would be 18 characters remaining. These would constitute the 11th line. The copy would, therefore, measure 11 lines in length.

Note: The Copy Fitting Chart and Scales are based on setting each line tight (i.e. running every line to 0 or near 0 on the justifier dial). Since most copy is set more loosely than this, it is wise to deduct two characters from the figure given on the chart or scale.