II. MECHANICS

PRELIMINARY PROCEDURES AND SIGN-ON

Before you start working at a MATH terminal, check the LCL/COM switch on the left side of the console. When it is down (on Local), the terminal operates as a conventional typewriter. When it is up (on Communicate), the terminal is ready to perform all MATH functions. Any continuous fold paper may be used, but that which reduces to 8 1/2 by 11 inch sheets is most convenient for later storage in a notebook.

To begin you must first establish contact with the computer and enter certain sign-on information. The appropriate steps depend on the equipment that connects your terminal to the MATH computer. You may have a Bell Telephone 103A Data Phone, an acoustic coupler, a 103F Data Phone, or a direct wire connection. The steps for establishing contact are given below for each of these four devices.

103A Data Phone

Turn typewriter on

Set LCL-COM switch to COM

Press TALK on Data Phone

Dial computer's telephone number

Listen for tone from phone

Press DATA on data phone

Hang up phone, if you wish

Wait 5 seconds

Press RETURN on 2741

Acoustic Coupler

Turn typewriter off

Set LCL-COM switch to COM

Turn acoustic coupler on

Dial computer's telephone number

Listen for tone from phone

Insert phone into acoustic coupler

Turn typewriter on

Wait 5 seconds

Press RETURN on 2741

103F Data Phone

Turn typewriter on

Set LCL-COM switch to COM

Wait 5 seconds

Press RETURN on 2741

Direct Wire to Computer

Turn typewriter on

Set LCL-COM switch to COM

Wait 5 seconds

Press RETURN on 2741

The final step in establishing contact is pressing the carrier RETURN. If you are connected to a DOS system, the computer will respond in this way asking you to identify yourself:

```
MATH at your service
Initials please:
```

Enter your initials, as they were reported to the computation center, and strik RETURN. In response to "Plus file number:", enter a plus sign and follow it with the file number that you were issued.

After you have pressed RETURN, the computer prints: Please key "Head.". Roll the paper to the bottom of the fanfold sheet, key "Head." on the last line of the sheet, and strike RETURN. On the top line of the next fanfold sheet the computer prints a page heading containing the time, the date, your initials, th page number, and an optional message. When the paper spaces down one inch, MATH is at your service. This procedure is shown in the example below:

```
MATH at your service
Initials please: JRD
Plus file number: +247
Please key "Head.".

Head.
11:35 - 4-15-68 - JRD - (1)
```

In this and all other examples throughout the manual, the typist's entries are printed in green and the computer's responses in black. In every respect these examples show real MATH actions exactly as they are recorded at a terminal. That is, the examples do not show you what might happen, but what actually did happen as these examples were entered on the MATH terminal. If your instructio to MATH are not being printed in green, your terminal may lack the ribbon shift

feature or a green and black ribbon. Information on how to order these items is provided later in this section.

If you are connected to a CTS system, the sign on is different. In response to your initial carrier RETURN the computer will give you the location and ask you to identify yourself:

```
ASDD Los Gatos CTS/360 4-15-68 11:34
TYPE name;#;key
```

Enter the requested information exactly as it was reported to the computer and in the precise form illustrated -- three fields for each of the three items, semicolons between the fields, and no spaces after the semicolons. After you have typed the information, strike RETURN.

If you have made an error, you will receive the OFF message. Begin the whole procedure again and correct what was wrong. If your first entry was error-free, the OFF message means the computer does not recognize you. In that case, check with your computation center again about the administrative arrangements. When the computer recognizes you, it prints "SELECTION:" and waits for your response. Type the word "math+" and press RETURN. This procedure is shown in the example below:

```
ASDD Los Gatos CTS/360 4-15-68 11:34
TYPE name;#;key
 John R. Disbrow;935;key
SELECTION: math+
Please key "Head."

 Head.
11:35  4-15-68  JRD  (1)
```

TWO KEYBOARDS

MATH(JOSS) service can be obtained from terminals which have either the CTS or the JOSS keyboard. The former is the standard 2741 correspondence keyboard supported by TEXT, MATH and other CTS applications. The latter keyboard was developed specifically for JOSS from human factor studies at the RAND Corporation.

CTS KEYBOARD

JOSS KEYBOARD

The JOSS keyboard has been used for the examples in this manual and throughout the documents in the bibliography. Note the presence of the raised dot for the multiply operation, the location of the brackets, the inclusion of symbols for the relational operators, and the placement of all basic arithmetic operators in lower shift. If you are a DOS/MATH user or a CTS subscriber who is primarily interested in using MATH, you will want to use this keyboard.

If you have a CTS keyboard and 043 print element, you should know the following equivalents:

JOSS		CTS
·	(multiply)	*
*	(raise to power)	'
|	(absolute value)	!
≤	(less than or equal to)	le
≥	(greater than or equal to)	ge
<	(less than)	lt
>	(greater than)	gt
≠	(not equal)	ne

Thus a request to type the result of $2x^3$ (if x is greater than zero) would be entered as:

```
Type 2·x*3 if x>0.          (JOSS keyboard)
Type 2*x'3 if x gt 0.       (CTS keyboard)
```

If you wish to order a JOSS print element and a set of keytops from your IBM branch office, you will need this list of IBM part numbers.

ITEM	PART
JOSS print element	1167934
' over 1 keytop	1158410
" over 2 keytop	1127846
≤ over 5 keytop	1158411
≥ over 6 keytop	1158412
< over 7 keytop	1133953
> over 8 keytop	1133954
* over + keytop	1158413
| over • keytop	1158414
≠ over = keytop	1158415
[over , keytop	1158416
] over . keytop	1158417

A customer engineer can replace the keytops in about 20 minutes.

MATH uses the plus sign to determine which keyboard you are using. In CTS the plus sign follows the name selected:

SELECTION: math+

In DOS the plus sign precedes the file number:

Plus file number: +247

If you receive an unusually punctuated MATH message (e.g., Please key @Head.@.) check that the plus sign was correctly entered during sign on.

TWO-COLOR PRINTING

It is convenient to distinguish what you and the computer type. In the MATH and CTS/TEXT manuals, for example, the user entries are printed in green and the computer responses in black. If you use CTS or DOS/MATH at a properly equipped terminal, this color shifting occurs automatically.

Red ribbon shift, a standard 1050 and 2740 feature, has not yet been announced for the 2741. However, there has evolved a standard 2741 Red Ribbon Shift RPQ, and both the CTS monitor and DOS/MATH support it. It is RPQ 868019 and can be field installed. Green and black ribbons may be purchased from either IBM'S Office Products Division or the Columbia Ribbon Co. Purchase orders should include the following information:

from:

IBM - Office Products Division
740 New Circle Rd.
Lexington, Kentucky

Selectric ribbon cartridge
Black and medium green fabric ribbon
Wound green above black

from:

Columbia Ribbon and Carbon Co.
1159 E. Duarte Rd.
Duarte, California

Selectric Ribbon Cartridge
No. 40 medium ink on silk guaze
Black and No. 1553 ocean green
Wound green above black
Hermetically sealed.

The Columbia ribbon provides better contrast than the currently available IBM ribbon. This increased contrast improves the readability considerably. Both are comparably priced.