

Chapter 1: Introduction

1-1 System BIOS

1-2 Setup Program

DTK BIOS

Chapter 2: System BIOS

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26-20N, 26-20NR, 26-90N User's Manual

DTK BIOS

26-20N, 26-20NR, 26-90N User's Manual



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DTK BIOS
User's Manual

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Chapter 1: Introduction

This manual will acquaint you with the ROM on your motherboard. The software contained in ROM is composed of two important portions — system BIOS and the setup program.

1-1 System BIOS

System BIOS is fully IBM BIOS compatible. In addition, many special functions are provided. If you want to use them, you should enable them in the setup program.

You will find more information about the system BIOS in Chapter 2.

1-2 Setup Program

A system setup program included in your BIOS is used to set up your system hardware. Specifically, you can set the date, time, base memory, extended memory, number of floppy/hard disk drives and display configuration.

The setup program is simple to use: follow the instructions on the screen as they appear. If you want your computer to function normally, you should respond correctly to the screen prompts. Chapter 3 will explain the setup program in detail.

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Chapter 2: System BIOS

Your system BIOS is fully compatible with IBM BIOS that contains a POST (Power-on Self Test). In addition, this system BIOS supports the following:

- device drivers for standard AT system components such as fixed disks, monitors, keyboards and coprocessors
- 360KB, 1.2MB, 720KB and 1.44MB floppy drives
- a low-level fixed disk format utility
- three system utilities (a calculator, a hard disk park, and a timer)
- system password
- user-defined hard disk types
- NEAT chip set

These special functions provided by the BIOS in your system will be described in the following overview.

2-1 Hard Disk Preformat



System BIOS supports a low-level format utility through a preformatting process. Before becoming usable to save data, all hard disks need to be preformatted. If a hard disk contains defective tracks, you should first build the Bad Tracks Table to identify them. Then, you can start the preformatting process.

Note:

The preformatting process will destroy all data on the hard disk.

2-2 System Utilities

Three system utilities, a calculator, a hard disk park and a timer, are in your system BIOS.

These utilities are enabled by the setup program.

Note:

- You have to disable these utilities before you can run any diagnostic software.
- These utilities can be used in the text display mode only.
- When these utilities are enabled, base memory will be reduced by 7KB.

2-3 Password

You may create a password with the setup program to deny unauthorized users access to the computer.

When a password is set, the computer allows a user three chances to key in the password after the system has booted up.

If you have a short memory, you may want to keep a record of the password in a safe place.

2-4 User-defined Hard Disk Type

This system BIOS provides broad support for special hard disks that may be not on the list of 47 hard disk types. If you want to set up a hard disk which is not listed, the first step is to enter the ROM setup program for hard disk type to set the number of cylinders, heads, etc. Next, select hard disk type 48 or 49. When the system is rebooted, the hard disk in your system will work.

2-5 NEAT Chip Set

Your motherboard was designed around the NEAT chip set. The hardware supports NEAT functions and this system BIOS supports NEAT configuration functions. You may enable NEAT functions in the setup program. When the system is rebooted, the NEAT chip set will be reprogrammed to match the configuration settings you give in the setup utility.

Note that the setup program allows you to select a variety of system speeds. In some cases, the system may hang up. For example, at an operating speed of 16MHz on a 100ns DRAM motherboard, if you set the system for zero wait state and disable page-interleave in Turbo mode, the system will crash.

There are two methods to restart the system: set the system to normal mode with the hardware Turbo switch; press <Ins> (on the keypad) and do not release it until "*NEAT chips reset!*" appears on the screen. The latter will reset the NEAT chips to the default setting. If the memory mismatches the speed you want, enter the setup program to reset the configuration.

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Chapter 3: Setup Program

This chapter will guide you through the setup program.

3-1 Entering the Setup Program

There are two ways to enter the setup program: by pressing <F1> or by pressing <ESC>.

1. Pressing <F1> to Enter the Setup Program

You will need to press <F1> to enter the setup program in the following situations:

- when your computer is turned on for the first time
- when the rechargeable battery is dead
- when the hardware configuration is changed

If the battery for CMOS chip is dead or the system configuration does not match your actual hardware configuration, you will have to reconfigure your system. The computer will give you this screen message:

Press the F1 key to enter the setup
program or
press any other key to continue

Under the above three conditions, pressing <F1> will automatically start the setup program.

Under any conditions within DOS, you can use the DOS DEBUG command as follows:

```
A> DEBUG      ↵  
-g=F000:FF60  ↵
```

This command will start the setup program.

2. Pressing <ESC> to Enter the Setup Program

If you want to set up special functions provided by BIOS or reconfigure your system, you will need to enter the setup program. After starting your computer, press the <Esc> key quickly before the RAM test finishes. If you miss the chance to do so, reset your system and repeat the above procedures to enter the setup program. Before the setup program appears, the following message will appear on the screen:

SETUP utility will be starting

When the system self test is completed, the setup program will take over.

Once you have entered the setup program, you will see the following initial screen:

ROM SETUP PROGRAM VERSION 2.0
(C) COPYRIGHT DATATECH ENTERPRISES CO., LTD 1990.
ALL RIGHTS RESERVED.

- 1. SET UP SYSTEM CONFIGURATION.**

2. PREFORMAT HARD DISK.

3. SET UP BUILT-IN UTILITY.

4. SET UP PASSWORD.

5. SET UP USER-DEFINED HARD DISK TYPE.

6. SET UP NEAT CHIP SET.

9. QUIT SETUP PROGRAM.

CHOOSE ITEM NUMBER : [1]

3-2 Running the Setup Program

The menu of the setup program highlights the selected command. You can use the up <↑> and down <↓> arrows to select the desired item. Pressing the enter key <↵> confirms your selection or enters the next screen. If the option on the screen does not match your configuration, you have two ways to make modifications. You may either highlight selections and press <↵> to enter the command or use the left <←> and right <→> arrows to show different options and select from them.

If you want to exit a current screen, you may press <Esc> or select the exit item of the screen.

The following are examples of setup program screens and prompt windows you will see in using the program.

1. Setting Up System Configuration

If you choose item 1 from the screen on the previous page, the following will appear:

ROM SETUP PROGRAM VERSION 2.0
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SET UP SYSTEM CONFIGURATION

1. CURRENT DATE : [04-26-1990]
2. CURRENT TIME : [05:30:00]
3. COPROCESSOR : [1]
4. BASE MEMORY : [640 KB]
5. EXTENDED MEMORY : [1280 KB]
6. DISKETTE DRIVE A : [1.2 M]
- DISKETTE DRIVE B : [NO]
7. FIXED DISK TYPE C : [40 / MFM]
- FIXED DISK TYPE D : [NO / NONE]
8. PRIMARY DISPLAY CARD : [MGA]
9. EXIT

CHOOSE ITEM NUMBER : [1]

↑↓:CHANGE ITEM ←→:MODIFY ↵:ACCEPT

Setting Date and Time

The date and time will be maintained and updated by the real time clock in the system (if the battery is not dead), even when the system is off.

Setting Coprocessor

A math coprocessor is used to accelerate processing of calculation-intensive tasks. After it is installed in your system, the BIOS detects it and sets it up automatically. You don't need to change anything to indicate its presence.

Setting Base Memory

Base memory is usually 640KB. Correct base memory is set on the setup program menu. You may use the <←> and <→> direction keys to change entries or press the <↓> to key in correct information.

Setting Extended Memory

You may do this if your system has more than 1MB of RAM: 640KB of base memory and 384KB of shadow RAM.

You may use the <←> and <→> direction keys to change the amount of extended memory or press <↓> to key in correct information.

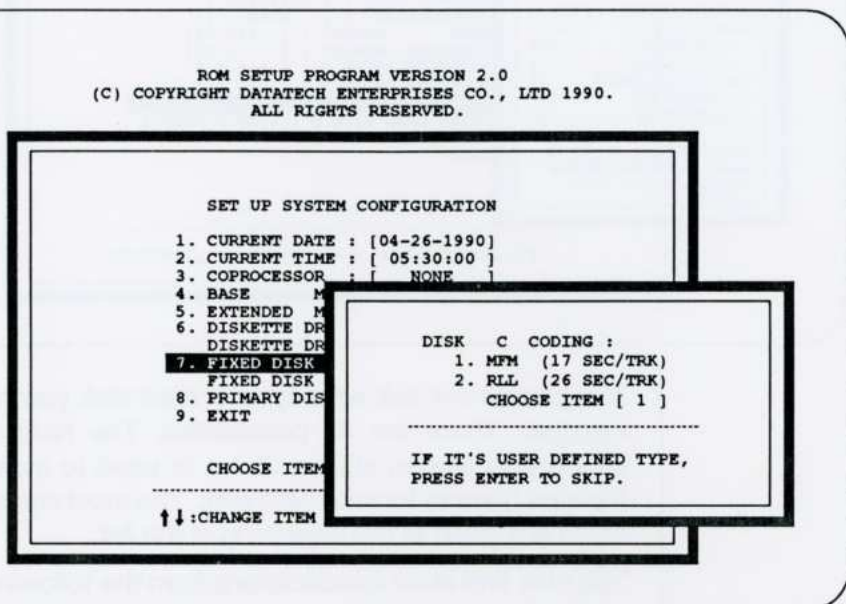
Setting Diskette Drive

You have five options for your diskette drive:

- 360K
- 1.2M
- 720K
- 1.4M
- not installed

Setting Fixed Disk Type

If you are about to set the fixed disk type, the screen will ask you how many fixed disks you have. Key in the number and press <↓> to confirm it. If you key in 1 or 2, the following screen will appear.



The fixed disk controllers that use the MFM and RLL encoding methods are supported. Fixed disk drives with 17 or 26 sectors per track may be configured with an MFM or RLL controller.

Select item 1 for a standard fixed disk.

Then, the next screen appears.

SET UP SYSTEM CONFIGURATION

SELECT DRIVE C TYPE

TYPE (1-49) : 1

CYLINDER : 306

HEAD : 4

SECTOR/CYLINDER: 17

PRE-COMP : 128

LAND-ZONE : 305

USE NUMERIC, ←→ AND
← KEYS TO SELECT
PRESS ESC TO EXIT

CURRENT DATE : [04-26-1990]

CURRENT TIME : [05:30:00]

COPROCESSOR : [NONE]

BASE MEMORY : [640 KB]

EXTENDED MEMORY : [0 KB]

DISKETTE DRIVE A : [1.4 M]

DISKETTE DRIVE B : [NO]

FIXED DISK TYPE C : [40 / MFM]

FIXED DISK TYPE D : [NO / NONE]

PRIMARY DISPLAY CARD : [VGA]

EXIT

CHOOSE ITEM NUMBER : [7]

↑↓:CHANGE ITEM ←→:MODIFY ↵:ACCEPT

The prompt will ask what type of hard disk you have installed. There are 47 possibilities. The hard disk information screen shown above is used to indicate the type number for your hard disk. The most common types are given at the beginning of the list.

You may find drive specifications from the following:

- the drive documentation provided with the drive,
- the information printed on the disk drive label, or
- the manufacturer of the fixed disk drive.

After you finish setting fixed disk type C, the *Disk D Coding* screen will appear if you selected two fixed disks earlier in the program. Then, you may proceed accordingly.

Note:

Two user-defined types can also be selected. Refer to page 19 for more information about it.



Setting Up Display Card

Setup for all display adapters except a CGA card is simply a matter of inserting the card in an expansion slot. If you have installed a CGA card, you should select the column configuration you want — 80 or 40 columns.

Final Confirmation of System Configuration

Once you have entered all appropriate information and exited via item 9, you will be asked to confirm that the configuration data are correct.

Answer Y or N. If you answer N, the program will return to the beginning of the setup sequence.

If you answer Y, the program will continue. The setup program will restart the computer from the RAM test.

2. Preformatting Hard Disk

If you want to preformat your hard disk(s), reenter the setup program and select item 2. The program will then proceed as below:

```
ROM SETUP PROGRAM VERSION 2.0
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```

```
1. SET UP SYSTEM CONFIGURATION.
```

```
2. PR
```

```
3. SE
```

```
4. SE
```

```
5. SE
```

```
6. SE
```

```
9. QU
```

```
CH
```

PREFORMAT HARD DISK

1. DRIVE TO PREFORMAT (C,D) : [C]
2. INTERLEAVE RATE (1,2,3) : [3]
3. BUILD BAD TRACKS TABLE : [0]
4. BEGIN TO PREFORMAT.
5. EXIT

```
SELECTION [5]
```

```
↑↓:CHANGE ITEM
```

```
↵:ACCEPT
```

Interleave Rate

The mechanical read/write head on the hard disk cannot access information as rapidly as the microprocessor can handle it; therefore, information is usually not written to or read from a hard disk in contiguous sectors. Instead, sectors are skipped over, thereby allowing the drive head to catch up with the faster electronic parts of your computer.

Consult your computer dealer if you are in doubt as to which rate above to choose.

Bad Tracks

The following information is needed to configure bad tracks:

- number of cylinders
- number of heads

You may find the above information from the following:

- the disk drive documentation provided with the drive,
- the information printed on the disk drive label, or
- the manufacturer of the fixed disk drive.

After you have finished the entries, press the <E> key to accept the entries and exit. Then, the number of bad track(s) which you have built will appear at item 3 on the screen.

Preformatting

If you choose to preformat your hard disk(s), the program will display windows with the information you have entered.

The values for head and cylinder will keep decrementing until the formatting process is completed. The cylinder number, when doing hard disk preformat, can be greater than 1024.

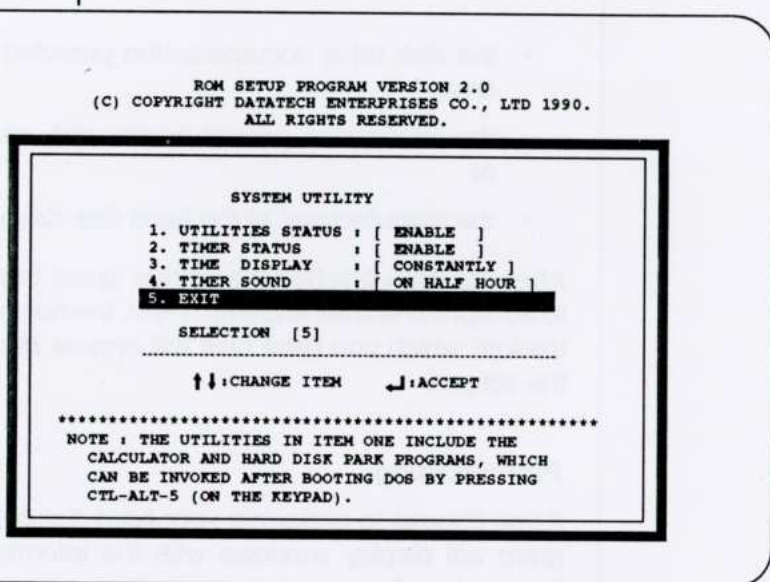
Preformatting Another Hard Disk

When you finish the preformatting process for hard disk C, the program will return to the *Preformat Hard Disk* screen. If you want to preformat hard disk D, you should select drive D by using the <←> and <→> keys. Then, you may proceed accordingly.

3. Setting Up Built-in Utility

If you want to enable the utilities — the calculator, the hard disk park, and the timer, you should enter the setup program and select item 3. Before entering the system utility, you will see a warning message. It has no effect on any function of your system.

The built-in utility screen will look like this:



Utilities Status — Calculator and Hard Disk Park

The utilities status controls two system utilities, which are enabled through the setup program. Then, you can press <Ctrl>, <Alt> and <5> (on the numeric keypad) in the 80-column text mode to start the following program:



Use the <↑> and <↓> keys to select entries. Press <↓> to accept entries. Pressing <ESC> will exit the program.

- **Calculator:**
Refer to *Appendix* in this manual for detailed information about the calculator.
- **Hard Disk Park:**
If you select HDISK PARK, the following screen will appear:



This utility can park your hard disk before moving your computer to prevent data loss or hard disk errors.

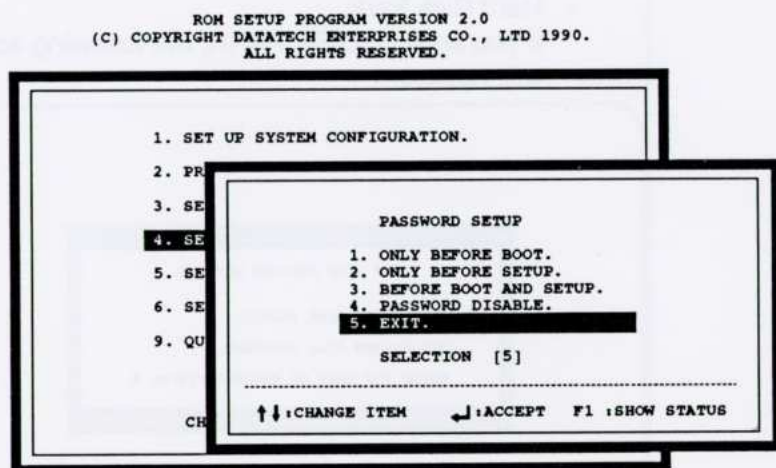
Timer

The timer has two basic functions:

- Current time can be turned off, set to display on the hour, or set to display constantly.
- An alarm can be set for each hour, half an hour, or turned off.

4. Setting Up Password

Selecting item 4 in the setup menu will start the system password setup. The following is the screen for setting up a password:



You can key in a password with a maximum of seven alphanumeric units. The password may be kept in a DOS formatted diskette if you have a short memory.

When the password is set, the user is given three chances to key in the password after the computer is booted up. If the correct password is not given during the three tries, the system will not function. The system will ask you to insert the diskette (if you have one) on which your password is saved.

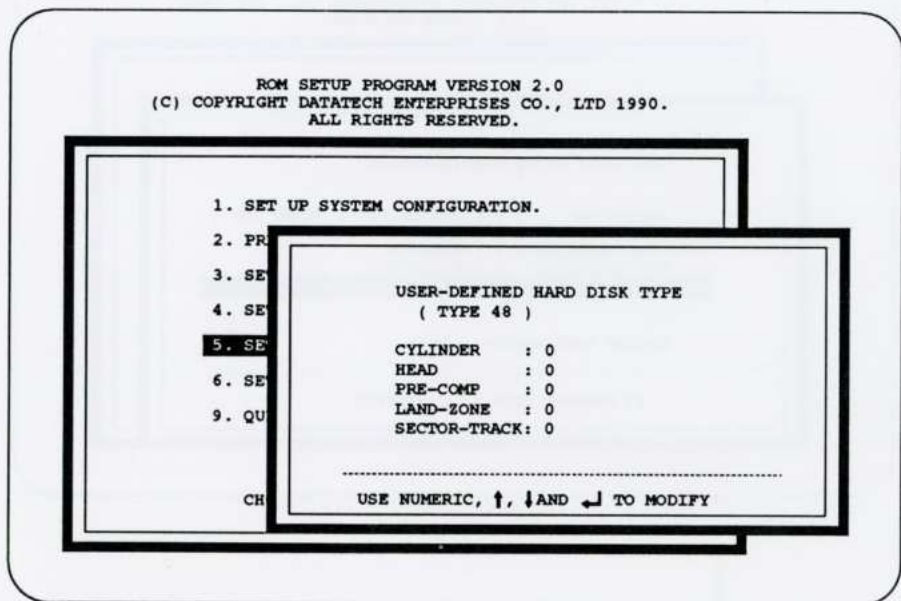
If you disable the password function, the new setup program will clear the previous password.

You may press <F1> to see the present password status.

5. Setting Up User-Defined Hard Disk Type

If none of the drive types (1-47) match the fixed disk drive specifications you have, select item 5 to configure a user-defined hard disk type. Then, the screen will ask you which type you want to define.

Confirm your selection. If you choose type 48, you will see the following screen:



When you finish keying in these numbers, this user-defined option may be used and will be defined as type 48.

Note:

The cylinder number can be greater than 1024.



6. Setting Up NEAT Chip Set

Selecting item 6 in the setup menu will let you set up the NEAT chip set.

You will see the following screen:

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NEAT CHIP SETUP CONFIGURATION

- 1. SHADOW RAM : [SYSTEM OFF , VIDEO OFF]
- 2. DRAM WAIT STATE : [ZERO WAIT STATE]
- 3. PAGE/INTERLEAVE : [DISABLE]
- 4. EMS INSTALLED : [DISABLE]
- 5. EXIT

CHOOSE ITEM NUMBER : [5]

↑↓:CHANGE ITEM ↵:ACCEPT

Shadow RAM

Shadow RAM can reduce the read time for system BIOS or video BIOS, thereby enhancing performance. There are four possibilities as follows:

- system off, video off
- system on, video off
- system off, video on
- system on, video on

You may use the <←> and <→> direction keys to change entries. The initial chipset default is system off, video off.

DRAM Wait State

DRAM is an abbreviation for dynamic random access memory.

You have two choices as follows:

- zero wait state
- one wait state

Zero wait state means that there are no pauses when the contents of the memory chips are being read.

Page / Interleave

Page-interleave mode can be enabled when there are even banks of memory (2 or 4 banks) on the motherboard. If you set on the page-interleave mode with odd bank(s) —1 or 3 banks, the system BIOS will neglect the setting while booting up.

EMS Installation

This computer supports the Expanded Memory System (EMS) to increase system memory capacity. This feature allows extended memory to be used as LIM EMS version 4.0 expanded memory.

If total system memory is less than 1MB, you won't have any expanded memory.

If total system memory is greater than 1MB, you can enable EMS.

If you want to install EMS, you should first enter the EMS installation item in the setup program and select the EMS size desired .

To install the EMS driver included on the utility diskette, follow the steps below:

- After booting DOS, insert the utility diskette into drive A.
- Change to NEAT_EMS directory, and type:
INSTALL
- Choose the configuration you want, and press <F1> to complete setup.
- Reboot your system after the installation is complete. The screen will look like this:

```
=====
DTK NEAT Expanded Memory Manager Ver. 1.10 1990
(C) Copyright Datatech Enterprise Co.,Ltd
All Rights Reserved
# 11060790
=====
```

```
User specified PAGE PORT = 208H
User specified PAGE FRAME = D000H
Test Expanded Memory Page 128
There are 128 PAGEs for EMS.
NEMM.SYS has been installed.
```

7. Exiting the Program

Once you have entered all appropriate information, you may exit the setup program by choosing item 9. The system will restart from the RAM test. If at a later date you alter the configuration of your system, you will need to go through the program again and make the appropriate changes.

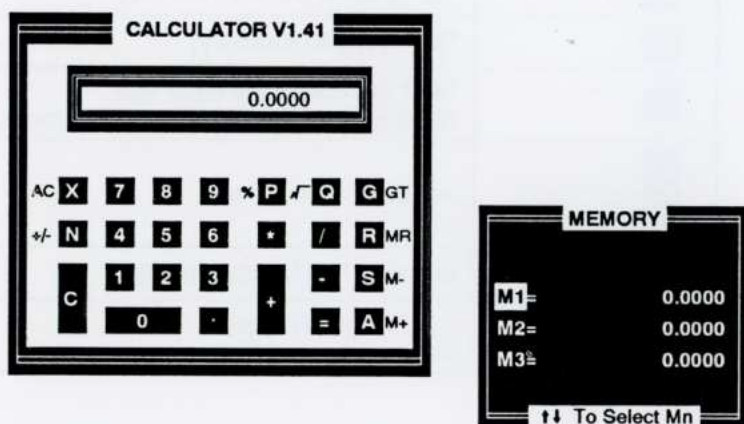
This page is intentionally left blank.

This appendix includes two sections :

- calculator
- system BIOS error messages

A: Calculator

Your calculator is a 12-digit and 4-decimal business calculator. After you start the calculator, the screen will appear as below:



Note:

This calculator runs only in the 80 columns text mode.

1. Key Functions

Keys	Function
0 – 9	number keys
+ - / * =	basic operators
P	"%" (percent)
Q	"√" (square root)
R	"MR" (memory recall)
S	"M-" (remove from memory)
A	"M+" (add to memory)
X	"AC" (all clear) will clear the number on screen and other memory.
C	will clear the screen
G	equal to "GT" (grand total)
N	"+/-" (sign change) will toggle sign of the number

2. Basic Calculations

- When any of the four basic calculations is performed, the command sign will appear on the screen.
- A present function command will replace the previous function command.

For example:

$$(3+5) \times 22 / 7$$

You should press 3, +, 5, *, 22, /, 7, and =.
The following will appear:

G	25.1428
---	---------

$$4 \times (-7) + 13$$

You should press 4, *, 7, N, +, 13, and =.
The following will appear:

G	-15.0000
---	----------

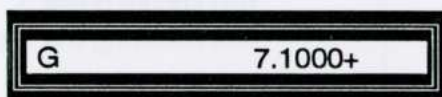
3. Using Constants

Press the same basic function command twice to set a number as a constant, and the "k" sign will appear on the screen.

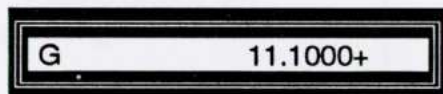
For example:

$$4 + 3.1$$

You should press 4, +, +, 3, ., 1, and =.
The following will appear:



If you press the $\leftrightarrow$ key again, the following will appear because the number +4 is a constant.



4. Square Roots

For example:

$$\sqrt{3}$$

You should press 3, then Q.

$$\sqrt{2} \times \sqrt{4.3}$$

You should press 2, Q, *, 4, ., 3, Q, and =.

$$(\sqrt{2} + \sqrt{3}) \times 5$$

You should press 2, Q, +, 3, Q, *, 5, and =.

5. Memory Calculations

For example:

If you select memory M1

$$(53 + 6) + (23 - 8)$$

You should press 53, +, 6, and A (A stands for M+).

The following will appear:

MEMORY	
M1=	59.0000
M2=	0.0000
M3=	0.0000
↑↓ To Select Mn	

Then press 23, -, 8, and A.

The following will appear.

MEMORY	
M1=	74.0000
M2=	0.0000
M3=	0.0000
↑↓ To Select Mn	

6. Percentage Calculations

For example:

20% of 7500

You should press the 7500 , *, 20, and P keys.

Ratio of 360 to 800

You should press the 360, /, 800, and P keys.

15% add on of 1500

You should press 1500, *, 15, P, and +.

25% discount of 3200

You should press 3200, *, 25, P, and -.

7. GT Memory

GT memory gives the grand total of amounts stored in memory.

Be sure to press the AC key prior to starting a memory calculation.

For example:

$$(70 + 20 + 5) + (21 - 5 + 6.32)$$

First, you should calculate the amount $(70+20+5)$. Then, calculate that of $(21-5+6.32)$ and press G.

The following will appear:



8. Business Applications

Mark-up

For example:

What are the selling price and profit when the purchasing price of an item is \$720 and the profit is 25%?

Press 720, +, 25, P. The selling price is \$960.

Pressing <-> will show the profit of \$240.

Mark-down

For example:

What will the bargain price and loss be if a \$270 item is sold at a loss of 8% of the bargain price?

Press 270, +, 8, N, and P. The bargain price is \$250.

Pressing <-> again will show the loss of \$20 on the screen.

9. Increase / Decrease

For example:

If you made \$160 last week and \$200 this week, what is the percent increase?

Pressing 200, -, 160, P will get the answer: 25%.

ROM BIOS Checksum Error

- Indicates an invalid ROM BIOS failure.

8254 Error

- Indicates a 8254 timer controller failure.

8237 Error

- Indicates a 8237 DMA controller failure.

74612 Error

- Indicates a 74612 page register failure.

8259 Error

- Indicates a 8259 interrupt controller failure.

8742 Error

- Indicates a 8742 controller failure.

Check Battery

- Indicates a system backup battery disconnection or power loss.

RTC Checksum Error

- Indicates that the system memory refresh function does not work.

Refresh Indicator Error

- Indicates that the system memory refresh does not work.

Base 64K Memory Error

- Indicates that the system's first 64K memory does not work.

FDC Error User Check

- Indicates that the floppy diskette controller does not work.

FDD Seek Failure

- Indicates a failure of the floppy diskette drive “seek” operation.

Keyboard Error User Check

- Indicates the disconnection of the keyboard from the system or a keyboard device failure.

Parity Error but Segment not Found, Press any Key to Continue

- Indicates that the NMI circuit has detected a RAM parity error.

System Memory Mismatch, Run SETUP

- Indicates a mismatch of memory size in the CMOS RAM as well as onboard. You need to run the setup program.

Display Card Mismatch, Run SETUP

- Indicates a mismatch of a record typed in the CMOS RAM as well as onboard. You need to run the setup program.

