The Dick Smith System 80 Mk.II Business Computer

The Dick Smith System 80 Mark II Business Computer is a development from the original System 80 computer. It provides virtually all of the features which have made the basic machine so widely used by schools, colleges and private individuals, together with many additional features designed to make it more suitable for serious business use. These features include full video display of lower-case letters (essential for serious word processing), and a separate numerical keypad for fast and easy entry of numbers. The machine also features a built-in "communications terminal" program, making it ideal for accessing data base services.

The additional features of the Business Computer make it virtually three machines in one: a computer, a word processor (with suitable software), and a data communications terminal.

Like the original System 80, the Mark II Business Computer provides the powerful industry-standard Microsoft "Level II" 12K BASIC as standard. This means that it can run just about all of the enormous range of software that has been written in this version of BASIC. This includes most of the software written for the Tandy TRS-80 machine.

As with the basic System 80, the new Business Computer is based on the powerful Z-80 microprocessor, now used in most personal and small business machines.

The Business Computer itself consists of the Z-80 based CPU (central processing unit) with 13K of read-only memory (ROM) containing the system monitor, BASIC interpreter and a number of powerful utility routines (described later), together with 16K of read-write RAM memory for user programs. These are housed in an attractive typewriter-sized case which also includes operator input keyboards, video display circuitry designed to work with a standard video monitor, and a power supply. So when combined with a standard video monitor (such as our X-1196), it forms a fully operational basic computer system.

A cable is supplied with the machine to allow a standard audio cassette recorder to be used for storage of the computer's programs and data, if desired. An optional printer interface is also available for this basic configuration. However the Business Computer is primarily intended to form the heart of an expanded system, with up to 48K of user RAM memory, from one to four floppy disk drives for program and data storage, one of a number of printers, and quite possibly a modem unit for data communications.

16K Cat. X-4100
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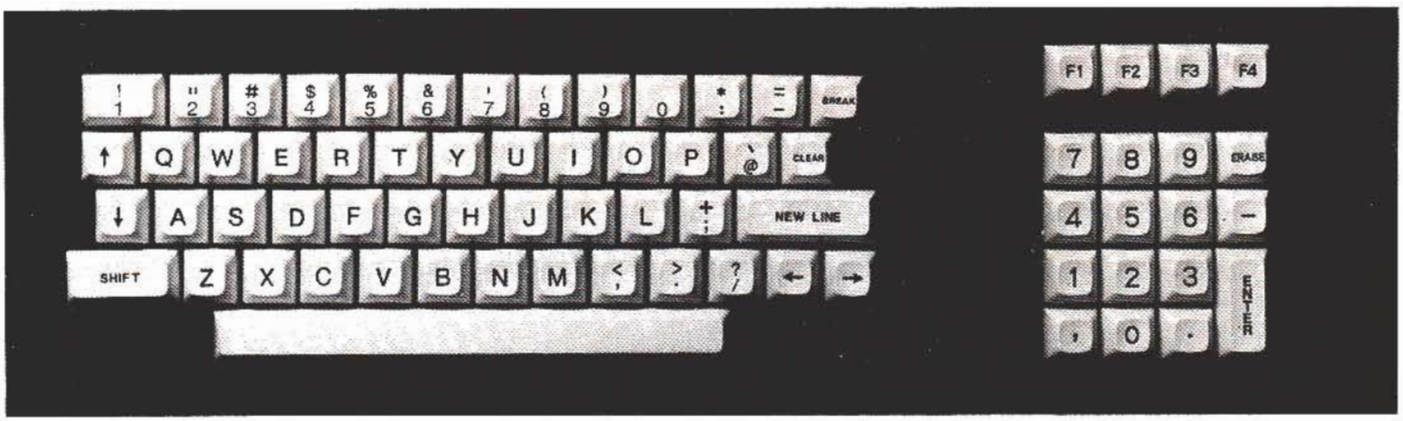

The System 80 Business Computer's special features

Along with all of the main features of the original System 80 computer, the Mark II Business Computer offers many exciting new features designed to make it of particular value for serious business applications:

1. FULL UPPER AND LOWER-CASE VIDEO DISPLAY

For serious word processing, a computer must be able to display the full upper and lower case character set on its video screen. The Business Computer provides the full character set, with the lower case letters having "true descenders" for maximum clarity.

2. OPTIONAL "TYPEWRITER" KEYBOARD MODE

For a computer to be used for serious word processing, its keyboard should also allow operation in conventional "typewriter" mode (lower case letters normal, with the SHIFT key used for capitals) rather than "computer" mode (upper case letters normal). The Business Computer lets you change from one mode to the other at any time, making it ideal for both word processing and normal computing.

3. ADDITIONAL 15-KEY NUMERIC KEYPAD

A normal typewriter-format keyboard is fine for many purposes, but it's not ideal for keying in big lists of numbers. Here a separate numeric keypad is best, as it lets you key in numbers rapidly with one hand and a minimum of effort. The System 80 Business Computer gives you a 15-key numeric pad complete with BACKSPACE/ERASE, decimal point, comma and duplicate ENTER keys, quite separate from the main keyboard.

4. FOUR USER-DEFINED SPECIAL FUNCTION KEYS

Many business programs require the operator to key in special control codes to call up certain functions or select a new operation. The System 80 Business Computer provides four additional keys which your programs can use for this purpose. Your programs can give these keys any significance they require.

5. INBUILT "SCREEN PRINT" FACILITY

In many business computing applications, it is very desirable from time to time to be able to get a "hard copy" printout of the information currently visible on the video screen. The System 80 Business Computer lets you do this at any time (assuming you have a printer, of course!) simply by pressing a special combination of keys. After printing out the screen, control returns automatically to your program.

6. INBUILT COMMUNICATIONS TERMINAL PROGRAM

The System 80 Business Computer isn't the only small system that can be used as a communications terminal for accessing central data bases and exchanging information with other computers. But with most such computers, you can't do this until you have loaded in the appropriate terminal program, from disk or tape cassette — quite a hassle. Our Business Computer has a unique inbuilt communications terminal program, which can be called up at any time simply by keying in a couple of simple commands. So your computer becomes a communications terminal in seconds!

NOTE: To use the computer for communication over the telephone network, you will also need the X-4010 Expansion Unit and the X-3270 Acoustic Coupler Modem.

7. PROVISION FOR REMOTE OPERATOR TERMINAL

In many business applications, it can be very handy to be able to control of feed data into the computer from a second operator console. The System 80 Business Computer has an inbuilt provision to allow transfer of control to a second terminal or computer. So you can have one keyboard near the telephone and another near the sales counter, for example!

8. OPTIONAL FLASHING CURSOR

A flashing video cursor is generally very handy on a computer used for serious business work, because after an interruption it allows the operator to see at a glance where the work had reached. However there are some programs which provide their own cursor, as part of an integrated video display format. The System 80 Business Computer is very flexible here: it gives you an optional automatic flashing cursor, which may be used or disabled as desired. It also provides improved "anti-bounce" protection on the keyboard scanning, for even greater reliability.

powerful BASIC

Let's now take a closer look at the 'Level II' BASIC in the Dick Smith Business Computer. This Microsoft 12K BASIC can be divided into eight sections:

1. ACTIVE COMMANDS
2. TEXT EDITING
3. BASIC STATEMENTS
4. ARRAYS
5. STRINGS
6. ARITHMETIC FUNCTIONS
7. GRAPHICS
8. SPECIAL FEATURES

There are four different operating levels:

1. Active command level; In this level, the computer responds to commands as soon as they are entered (by pressing the new line key). Whenever the >__ signs are on the display, the user is in the active command level.
2. The Program Execution Level: This level is entered by typing RUN, causing the BASIC program in the memory to be executed. On entering this level all variables are set to null (empty) before execution starts.
3. Text Editing Level: This level allows the user to modify, add or delete characters and lines of the BASIC program source resident in the memory. The most significant feature of this level is that the user can change any portion of a line without having to re-type the entire line.
4. Monitor Level: This level permits the user to load machine-language programs into the memory. This may be a machine language executable program or even data files. Such 'object' files can also be accessed by BASIC programs.

Microsoft 12K BASIC accepts variable names which can be longer than two characters; however, only the first two characters will be recognised as the variable name by the computer. Variables must start with a letter; the second character may be a letter or a digit. Therefore variables may be from AA to ZZ and A0 to Z9. Note however, that when using long variable names that they must not contain 'reserved' words. These reserved words are BASIC instructions such as 'GOTO'; 'PRINT'; 'RUN' etc.

There are four kinds of variables: Integer, Single precision floating point, Double precision floating point and String. These are distinguished by appending one of the following special characters, respectively: %, !, #, $.

The following operators are used by the Business Computer:

+	Addition
–	Subtraction
*	Multiplication
/	Division
[(↑)	Exponentiation
<	Less than
>	Greater than
<>	Not equal
<=	Less than or equal to
>=	Greater than or equal to
=	Equal to

In addition, the BASIC recognises three logical operators:

AND, OR, NOT

and string operators for comparing the precedence of strings.

1. ACTIVE COMMANDS

1	AUTO	Automatic line numbering
2	CLEAR	Resets variables to zero and sets aside string space
3	CLOAD	Loads a program of specified filename from specified tape unit
4	CLOAD?	Verifies that the loaded program is correct
5	CONT	Continue execution after stopping
6	CSAVE	Saves BASIC program to tape
7	DELETE	Deletes line or lines specified from program
8	EDIT	Enters EDIT mode to correct part of a line
9	LIST	Lists the program lines specified
10	NEW	Clears the current program from memory
11	RUN	Starts program execution
12	SYSTEM	Enters monitor mode
13	TROFF	Turns off the trace diagnostic
14	TRON	Turns on the trace diagnostic
15	LPRINT	Prints a file to the printer
16	LLIST	Lists the program to the printer

2. TEXT EDITING

By typing in EDIT 100, for example, the BASIC will prepare to edit line 100. You can:

1. Insert text
2. Delete from end of line
3. Delete from cursor to end of line and insert text.
4. Add to end of line
5. List line
6. Quit and restart edit
7. Change characters

3. BASIC STATEMENTS

1. PRINT	18. STOP
2. PRINT@	19. GOTO
3. PRINT USING	20. GOSUB
4. INPUT	21. RETURN
5. DATA	22. ON GOTO
6. READ	23. ON GOSUB
7. RESTORE	24. FOR TO STEP
8. PRINT#	25. NEXT
9. INPUT#	26. RUN
10. DEFINT	27. ON ERROR GOTO
11. DEFSNG	28. ERROR
12. DEFDBL	29. RESUME
13. DEFSTR	30. REM
14. CLEAR	31. IF
15. DIM	32. THEN
16. LET	33. ELSE
17. END	34. INKEY$

4. ARRAYS

Microsoft 12K BASIC is capable of accepting both numeric and string arrays. An array is simply a list or table of data which is set out in the memory of the computer for easy access by programs. The dimension of an array is simply the number of ways it is expanded from a single value. Thus a table of data with eight columns and eight rows is a two dimensional array containing sixty-four separate variables. In the computer these are represented with subscripts: e.g. A(1,1), A(1,2), A(1,3). . . .A(8,8) These arrays are set up in the computer using the DIM statement.

5. STRINGS

Microsoft 12K BASIC uses two kinds of strings:

1. Constants – these are always represented within quotes inside the program: e.g. "YES"
2. Variables – e.g. A$

As you can see, a string is simply a 'string of characters'; they can, of course, be letters, numbers or special punctuation and mathematical characters. The computer can add, divide, compare and create strings as you desire. The functions it uses are:

1. ASC
2. CHR$
3. LEFT$
4. RIGHT$
5. LEN
6. MID$
7. STR$
8. STRING$
9. VAL

6. ARITHMETIC FUNCTIONS

There are sixteen built-in arithmetic functions:

1. ABS
2. ATN
3. CDBL
4. CINT
5. COS
6. CSNG
7. EXP
8. FIX
9. INT
10. LOG
11. RANDOM
12. RND
13. SGN
14. SIN
15. SQR
16. TAN

7. GRAPHICS

The graphics are arranged as 48 lines of 128 columns. The graphics commands available are as follows:

1. SET
2. RESET
3. CLS
4. POINT

8. SPECIAL FEATURES

The following special features are implemented:

1. INP – This command will input an 8-bit byte from the port specified.
2. OUT – This command outputs a byte to the port specified.
3. PEEK – This command returns the decimal value of the contents of the memory location specified.
4. POKE – This command lets you insert a value into the specified location in memory.
5. POS – This command returns a number from 0 to 63 indicating the current cursor position on the display line.
6. MEM – This command returns the number of unused and unprotected bytes in memory.
7. USR – This command calls a machine language subroutine and passes the argument to the subroutine.
8. VARPTR – This command returns an address value for the operand, a variable name.

9. ERROR CODES

To assist in trapping errors in your program, the Microsoft 12K BASIC has twenty-two error codes:

1	NF	NEXT without FOR
2	SN	Syntax error
3	RG	RETURN without GOSUB
4	OD	Out of data
5	FC	Illegal function call
6	OV	Overflow
7	OM	Out of memory
8	UL	Undefined line
9	BS	Subscript out of range
10	DD	Redimensioned array
11	/0	Division by zero
12	ID	Illegal direct command
13	TM	Type mismatch
14	OS	Out of string space
15	LS	String to long
16	ST	String formula too complex
17	CN	Cannot continue
18	NR	No resume
19	RW	RESUME without error
20	UE	Unprintable error
21	MO	Missing operand
22	FD	Bad file data

10. VARIABLE/CONSTANT RANGE AND PRECISION

Microsoft 12K BASIC as provided in the System 80 Business Computer is very flexible in terms of the range of variable/constant values. There is also more than sufficient numerical precision for all normal calculations:

A. INTEGERS:

These may have any whole number value between −32769 and +32768 – i.e., a maximum of 4-½ significant figures.

B. SINGLE PRECISION FLOATING POINT NUMBERS:

These are stored with 7 digits of precision, but only the most significant 6 digits are displayed or printed out. Single precision numbers can have a value between 1.701411E−38 and 1.701411E+38.

C. DOUBLE PRECISION FLOATING POINT NUMBERS:

These are stored with 17 digits of precision, but the most significant 16 digits are displayed or printed out. Double precision numbers can have a value between 1.701411834544556E−38 and 1.701411834544556E+38.

D. STRINGS:

Any string or element in a string array can consist of up to 255 characters.

This powerful BASIC interpreter is functionally identical with Tandy TRS-80 Level II BASIC. This means that you can use most of the enormous number of programs that have been written for the TRS-80 computer since it was first released several years ago. So now you can have the latest innovations in computer design – with software ready and waiting.

but that's not all. It's also designed for full expansion:

The Dick Smith System 80 MkII Business Computer is far more than just a desk-top computer with dual keyboards and a powerful inbuilt BASIC. In reality it's designed to form the heart of a fully expanded system, capable of doing just about any of the computing jobs required by the average small business. Using the X-4010 Expansion Unit (described in a separate data sheet) and various peripheral units such as printers (X-3252, X-3255 or X-3265), floppy disk drives (X-4050) and a modem (X-3270), you can expand your system as follows:

1. MEMORY EXPANSION

The user RAM memory of your Business Computer system can be expanded to either 32,768 bytes ("32K") or 49,152 bytes ("48K"), as required. The larger of these figures is the maximum user RAM available on the majority of the current small computers, and is sufficient to run virtually any small business software.

2. FLOPPY DISK DRIVES

The Business Computer's Expansion Unit features a floppy disk controller capable of operating from one to four 135mm (5¼in) mini-floppy disk drives. As each drive takes a disk capable of storing up to 100,000 bytes, this means that your system can have up to 400,000 bytes of data available on disks at any one time, to supplement its RAM memory capacity.

3. A PRINTER OF YOUR CHOICE

The Business Computer Expansion Unit gives you a full Centronics-type parallel printer port, the fastest and most efficient type of printer interface available. And Dick Smith Electronics can supply you with the most appropriate and cost-effective printer for your particular needs: from a low-cost dot matrix printer (X-3252), through a medium-cost high speed 80/132 column printer (X-3255) to a full daisy-wheel machine (X-3265) capable of superb word processor quality and proportional/boldface printing!

4. AN RS-232C COMMUNICATIONS PORT

The Business Computer's Expansion Unit also provides a serial data communications port, which meets the full RS-232C specification. The port is programmable for a full range of 10 different communication rates (from 110 to 2400 baud), and is also fully programmable in terms of data format. It is provided with all "handshaking" logic normally required for correct operation with modems and remote data terminals.

NOTE: It is also possible to use the RS-232C port as an alternative printer port. This allows the use of an older type serial printer, if you have one, in place of the modem parallel type.

5. AN ACOUSTIC MODEM FOR COMMUNICATIONS

In order to use your Business Computer for data communications over the telephone network, you will need a modulator/demodulator or "modem" unit. Our Acoustic Modem X-3270 connects directly to the RS-232C port on the Business Computer's Expansion Unit, to provide it with a high performance, high reliability communications facility at a price far lower than has been previously possible.

With the modem and its inbuilt communications terminal program, your Business Computer becomes a powerful, easy to use communications terminal – ideal for accessing remote data bases!

EXPANSION COMPONENTS AVAILABLE FOR YOUR BUSINESS COMPUTER:

Expansion Unit (X-4020)	$399.00
16K RAM Expansion Kit (X-1186)	$29.95
100K Floppy Disk Drive (X-4060)	$419.00
Drive Cable (X-3232)	$55.00
Low Cost Printer (X-3252)	$399.00
80/132 Column Printer (X-3255)	$799.00
Word Processing Printer (X-3265)	$1995.00
Printer Cable (X-4014)	$39.90
Acoustic Coupler Modem (X-3270)	$399.00

For further information on these items, please refer to their individual data sheets.