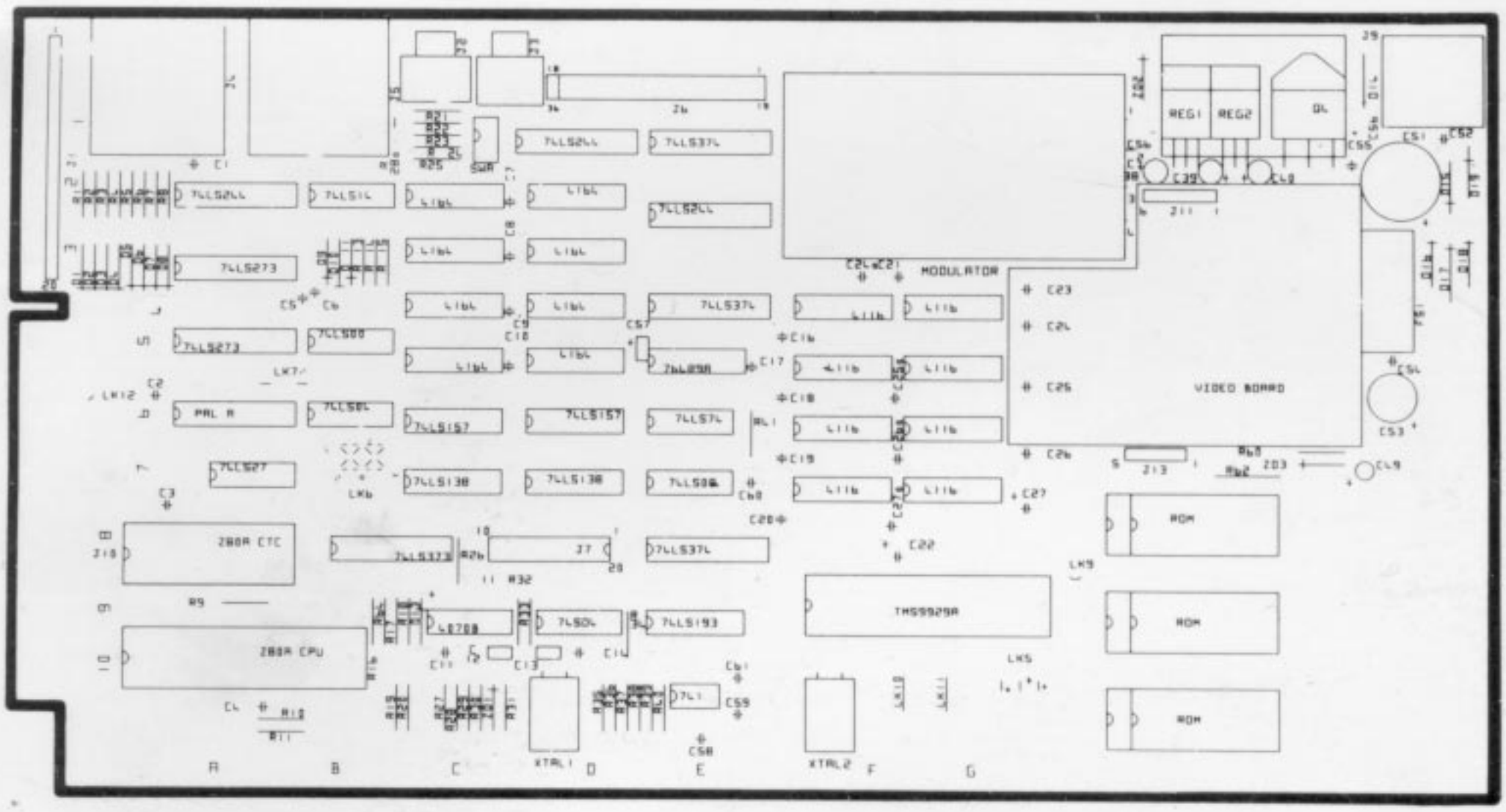
TECHNICAL SPECIFICATION



MEMOTECH

MTX

SERIES

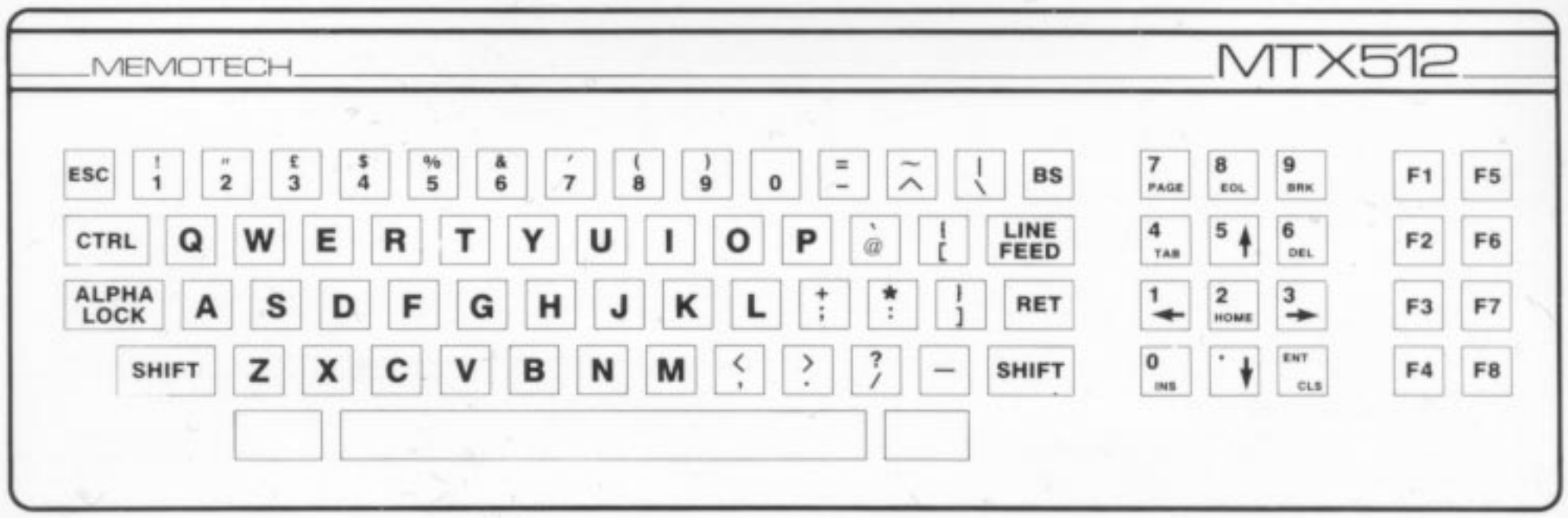
MEMOTECH MTX SERIES

TECHNICAL SPECIFICATION

Hardware

Chassis
Two front-hinged black anodised brushed aluminium extrusions are separated at the rear by a black plastic moulding. The extrusions act as heatsinks for the voltage regulation circuitry. Two matt black powder coated stamped aluminium endplates, are secured by 3 screws each.
Dimensions in millimetres: Width 488 Depth 202 Height 56
Weight: 2.6 kilograms

Keyboard
A 1mm mild steel sheet is bolted to the upper chassis and supports 79 keys which are interconnected by an independent p.c.b. The keys are arranged as:
Standard U.K. QWERTY layout with 57 professional typewriter keys, standard pitch and spacing. Keys F and J are recessed for easy fingertip location wherever possible. Foreign language keyboards are available. Twelve dual function keys are arranged as a separate numeric keypad with cursor control and editing keys. Eight function keys (programmable in conjunction with shift to provide 16 user definable functions).
Two unmarked keys, which must be depressed simulataneously to reset the computer.
Auto repeat is standard on the alpha-numeric keys.



CPU Board
Mounted in the lower chassis, the CPU board accomodates:
Zilog Z80A CPU operating at 4MHz.
24K of ROM which contains: MTX BASIC - incorporating sophisticated MTX LOGO-type graphics commands.
MTX NODDY - interactive screen manipulation routines.
FRONT PANEL DISPLAY - incorporating Z80 Assembler/Disassembler plus Z80 Register, Memory and Program display and manipulation routines, plus single stepping.
VIDEO DISPLAY PROCESSOR - with 16K dedicated video-RAM.
USER-RAM - 32K on the MTX500 and 64K on the MTX512.
VIDEO BOARD - for television and sound signal encoding.
Real Time Clock.
CHARACTER SETS - Numeric, upper case, lower case, user-definable characters and user-definable sprites.Resident international character sets and appropriate keyboard layouts for UK, USA,France, Germany, Spain and Sweden. Character sets for Denmark and Italy are also available.

Expansions

Up to two expansion boards may be added internally. These may be Memory (RAM) Boards or the Communications Board.

MEMORY BOARDS.

RAM may be increased by the addition of boards which provide 32K,64K, 128K or 256K of memory, up to a maximum of 512K.

COMMUNICATIONS BOARD

Available as an internal expansion, this board carries two completely independent RS232 interfaces (running at up to 19 200 baud) with full handshaking and modem communication lines, and also the disc drive bus. The communications board is required to run the FDX and HDX disc based systems and the MTX Node/Ring System.

NODE/RING SYSTEM - Communications software and interfacing. The system is interrupt driven, runs in conjunction with the twin RS232 communications board, and is controlled by simple Basic Commands to transfer Mail Programs and data to a ring of up to 255 MTX computers.

Compatability of the memory boards and communications board is given below.

Compatibility table of internal expansion boards

	RAM boards				
	32K	64K	128K	256K	Comms. Board
RAM boards 32K		●	●	●	●
RAM boards 64K	●	●	●	●	●
RAM boards 128K	●	●	●	●	●
RAM boards 256K	●	●	●	●	●
Comms. Board	●	●	●	●	

● = compatible

ROM Expansions

Via the cartridge port or disc drive bus these provide:

MTX PASCAL

NODE SYSTEM software

Business, Education and Games software

Display

Colour TV and/or Video Monitor

40 column x 24 line display as standard, with optional Colour 80 column board. (FDX or HDX disc based system required)

Display Facilities:

FULL SCREEN HANDLING

EIGHT USER DEFINABLE VIRTUAL SCREENS

SCREEN FORMATS

Text: 40 x 24 characters Text with graphics: 32 x 24 text with 256 x 192 graphics in 16 colours (maximum graphics resolution)

Graphics Facilities

Up to 32 independently controllable user definable sprites, plus pattern plane and backdrop plane. High level sprite-orientated graphics commands. See also MTX Graphics Commands at the end of this section.

Input/Output

Provided as standard:
Cassette Port (variable rate, up to 2 400 baud)
Uncommitted parallel input/output port
Two joystick ports with industry standard pin-outs
Four channel sound under software control - three independent voices plus pink noise output through TV speaker, or through separate Hi-Fi output
Monitor output - composite video signal (1V peak to peak)
Cartridge port
Parallel printer port (compatible with Centronics-type printers)
Available as an expansion:
Communications board with two RS232 interfaces and disc drive bus

Suitable Printers

Centronics-type parallel printers
RS232 serial printers (requires communications board)

Power Supply Unit

Input: 220/240 VAC 50/60 Hz. or 110/115 VAC 50/60 Hz.
Output: 22.5 VAC, 1A tapped at 18V and 9V.
Dimensions in millimetres: Width 92 Depth 110 Height 70
Weight: 1.0 kilogram
The PSU is double insulated and has a side mounted rocker switch which is internally illuminated when the unit is on. The mains transformer is located between two groups of four anti-vibration, noise absorbing rubber mounts. Extensive strain relief mouldings are incorporated in the PSU casing to support the input and output cables. The output cable terminates in a 240 degree, six pin DIN connector. The PSU is supplied as a sealed unit.

Software

High Level Facilities

The MTX Series software can be considered as a group of independent, highly interactive modules.

MTX BASIC

The BASIC resident in ROM contains the standard commands offered by most microcomputers, and in addition is extended with a number of reserved words designed to: a) allow easy manipulation of the display, b) enable a highly structured form of programming, and c) enable assembly language programs to be written and run within BASIC programs.
Other facilities include reserved word abbreviations, auto scrolling and recovery from assembly program loops.

MTX Graphics Commands

Sophisticated graphics manipulation commands are incorporated, which simplify the type of programming necessary to create effective games and serious graphics applications. These commands do not replace, but are in addition to the normal graphics commands offered by BASIC such as PLOT, CIRCLE and DRAW. See the end of this section for a list of command words and functions.

MTX NODDY

At its simplest level, NODDY immediately provides a filing system comparable to a card index. Without going any further this could be an address book, information records or just a note pad. Taken a stage further, the NODDY language allows records (pages) to be systematically displayed to give an electronic book or interactive information retrieval system. In many situations all that is required to reach an answer to a problem is to ask a series of questions where the next question depends on the previous answer. This method is used successfully in medical diagnosis. NODDY provides a very simple method of programming the computer to display information or ask questions and then move on to another display, depending on the previous response. Complete screens may be named and constructed and later called from within BASIC programs. On exit from NODDY to BASIC all NODDY screens/programs are saved intact. Coupled with the MTX ring facility, NODDY can be the basis of an interactive two way system, with applications in commerce, education and process control.

NODDY COMMANDS

BRANCH ENTER PAUSE
IF ADVANCE LIST
GOTO RETURN OFF
STACK DISPLAY
When working in NODDY you can:
1) create a page by giving it a title of your choice,
2) type DIR to see what pages already exist,
3) look at a page already in the DIRectory by typing its title.
NODDY also allows you to construct PROGRAM PAGES using the commands listed above, to manipulate and display text interactively.

SOUND

Your MTX 500 can produce a wide variety of sounds which can make your programs more interesting and which are sufficiently complex to turn the computer into a synthesiser.
Sound is obtained by inputting a sound statement which can be in two forms:
1. DIRECT
This mode plays a single note until stopped.
2. CONTINUOUS
Sequences of notes can be played by loading them into a sound buffer, with commands to adjust volume or pitch. The continuous sound made allows sound effects or music to be played without affecting the speed of programs running at the same time.

SOUND,CHANNEL,FREQUENCY,VOLUME
CHANNEL - There are four channels available. 0,1 and 2 produce pure tone and channel 3 produces pink noise
FREQUENCY - Frequency is determined by values in the range 0 to 1023.
VOLUME - The volume is determined by entering a value between 0 and 15 where 15 is the loudest and 0 is off.
CONTINUOUS SOUND is produced by a longer statement with seven parameters to enable you to make the sound change in pitch, volume and duration. To produce the continuous sounds the computer loads the statement into a sound buffer.
The sound buffer is a block of memory allocated for use by the continuous sound command SBUF. SBUF 3 for example allocates three blocks for each channel. The default value is two blocks per channel and therefore, if you do not specify a value high enough to accomodate your sound then part or all of your statement will not operate. In this way the SBUF commnand is similar to the DIM statement.

Assembler/Disassembler

An assembler/disassembler is included to enable fast and efficient development of machine code programs. The source code and object code occupy the same space in memory, allowing very compact storage of large assembly language programs. Machine code programs may be included within a BASIC program and are assembled as the BASIC program is run, allowing interaction of BASIC and machine code at a high level and avoiding the need to define fixed areas in which the machine code must reside, i.e. in REM statements or above RAMTOP.

Front Panel Display

The Front Panel Display is an interactive program which displays and allows manipulation of the contents of the computer's memory and registers. It is very useful for debugging and testing machine code programs, and the display of the internal interactions of the computer whilst a simple program is running is an effective way of becoming familiar with assembly language instructions. A list of Front Panel commands is given at the end of this section.

BASIC Editor

The BASIC Editor provides full editing facilities on BASIC lines.
All syntax errors are found as the BASIC line is entered, allowing error messages to be brief.

Applications

The MTX Series ROM contains the essential routines to allow a user to easily exploit the hardware facilities which are available.
Some of the features are demonstrated by the following examples of uses in education, business and games.

Education

The MTX Series is effective both in the classroom through CAL, using the Node/Ring system, and in the laboratory when utilising the extensive I/O and system monitor facilities.

Games and Graphics

As well as the normal BASIC graphics commands, LOGO-type commands are provided to enable the definition and animation of characters and sprites. A sprite can be thought of as a user definable character which can be moved around in front of the normal graphics display using comprehensive and powerful commands.

Business

The high quality keyboard and disc operating system (q.v.) allow the MTX user access to the wide range of business software available under CP/M. Where necessary, the Colour 80 column board can be used together with a monochrome or colour monitor to provide a powerful business computer comparable with larger, more expensive systems.

Command Words — MTX BASIC

ADJSPR
ANGLE
ARC
ASSEM
ATTR
AUTO
BAUD
CIRCLE
CLEAR
CLOCK
CLS
CODE
COLOUR
CONT
CRVS
CSR
CTLSPR
DATA
DIM
DRAW
DSI
EDIT
EDITOR
ELSE
FOR
GENPAT
GOSUB
GOTO
IF
INK
INPUT
LET
LINE
LIST
LLIST
LOAD
LPRINT
MSVPR
NEW
NEXT
NODDY
NODE
ON
OUT
PANEL
PAPER
PAUSE
PHI
PLOD
PLOT
POKE
PRINT
RAND
READ
REM
RESTORE
RETURN
ROM
RUN
SAVE
SBUF
SOUND
SPRITE
STEP
STOP
THEN
TO
VERIFY
VIEW
VS

MTX Operands

+
-
*
/
>
=
>
<
> =

MTX Functions

ABS
AND
ASC
ATN
COS
EXP
INP
INT
LEN
LN
MOD
NOT
OR
PEEK
PI
RND
SGN
SIN
SQR
TAN
USR
VAL

MTX Strings Functions

CHR$
GR$
INKEY$
LEFT$
MID$
RIGHT$
SPK$
STR$
TIME$

MTX Node Commands

BAUD
CALL
CANCELQ
CLEAR
CLEARQ
CONT
DIR
DISPLAY
ENTER
ERROR
EXT
FLAG
FORMAT
GOSUB
LIST
MAIL
MESSAGE
MRCV
MSEND
NAME
OFF
ON
POST
PRINT
PROGRAM
RCV
RESTORE
SEND
SET
STAT
STRING
SUSPEND

MTX Graphics commands

CLS
Clears the graphics (and text) screen
CSR x,y
Cursor Positioning
x,y must be in the range 0 to 255. This function does not change the cursor state but moves the stored print position to x,y
CRVS n,t,x,y,w,h,s,
Creates a Virtual Screen
n is the screen number in the range 0 to 7
t is the screen type. Currently two screen types are defined: 0 = text screen, 1 = graphic screen
x is the x origin i.e. the horizontal distance, in character blocks, from the top left hand corner of the screen
y is the y origin i.e. the vertical distance, in character blocks, from the top left hand corner of the screen
w is the number of characters on a line. This can be greater or less than the screen width
h is the number of lines of width w
s is the distance, in characters, from the start of one line to the start of the next. If 0 is input, s defaults to the screen width
The virtual screen default for colour is white ink on black paper
VS n
Calls a virtual screen
Switches to virtual screen n; n must be in the range 0 to 7
PAPER n
Selects paper colour
INK n
Selects ink colour
n must be in the range 0 to 15 for all colour commands
COLOUR p,n
Specific colour definition
n defines the colour
p is the control parameter
p = 0 Print paper
p = 1 Print ink
p = 2 Non-print (i.e. plot) paper
p = 3 Non-print (i.e. plot) ink
p = 4 Defines border colour
Two sets of colours can be defined
1. The print colours refer to the colours used when characters are printed
2. The non-print colours (i.e. plot colours) refer to two things:
   a) The colours used when plotting points, and
   b) The colours used on the screen when spaces are printed implicitly, i.e. during CLS, insert line and erase to end of line

ATTR p,state
Character Attributes
state 0 switches off ATTR
state 1 switches on ATTR
p is the control parameter
p = 0 Inverse print attribute
p = 1 Overprint attribute
p = 2 Unplot attribute
p = 3 Overplot attribute
PLOT x,y
Plots a pixel and also sets stored plot position co-ordinates
PLOT LINE x,y,x',y'
Draws a line from x,y to x',y' and does not change stored plot position co-ordinates
CIRCLE x,y,r
Draws a circle with centre x,y, radius r, and does not change stored plot position co-ordinates

ANGLE x
x in radians
Sets absolute angle to x radians. The angle is orientated using standard polar co-ordinates
PHI x
x in radians
Adds an angle of x radians to the current angle (R stands for Relative)
DRAW x
Draws a line of length x from the current stored plot position along a previously defined angle, and updates the stored plot position
ARC x,theta
Draws an arc of length x while turning through an angle theta The start position is the stored plot position, and initial orientation is the current angle Updates stored plot position and current angle

SPRITES

Up to 32 sprites, numbered 1 to 32
CTLSPR p,x
p is a control parameter controlling either speed, distance moved, number of sprites, number of circling sprites, plot sprite number, number of moving sprites and magnitude or size of sprites
x must lie within the range of p
SPRITE n,pat,xp,yp,xs,ys,col
n is the sprite number
pat is the pattern number
xp is the x axis position of the centre of the sprite
yp is the y axis position of the centre of the sprite
xs is the sprite speed in the x axis direction
ys is the sprite speed in the y axis direction
col is the sprite colour
Sprite co-ordinates are absolute and ignore virtual screen origins
MVSPR p,n,d
Moves a sprite
p is the control parameter
bit 0 means move sprite
bit 1 means rotate sprite
bit 2 means redirect sprite
bit 3 means plot a point at sprite centre
p is a complete parameter made up of bits as above
i.e. 10 (binary 1010) rotates sprite and plots a point at sprite centre (bit 1 plus bit 3)
n is the sprite number
d is the sprite direction
ADJSPR p,n,v
Alters previously defined sprite
p is the control parameter
p = 0 Pattern change
p = 1 Colour change
p = 2 Redefines x position
p = 3 Redefines y position
p = 4 Redefines x speed
P = 5 Redefines y speed
n is the sprite number
v must lie within the range of p
VIEW direction, distance
Controls the position of the display over the larger virtual graphics screen, which is 4095 x 4095 pixels
GENPAT p,ch,8 bytes
Generates a sprite pattern
p is the control parameter
p = 0 Bytes are input in ASCII code

p = 1 User defined graphics
p = 2 User defined graphics colour
p = 3 Defines 8 x 8 sprite pattern
p = 4 Defines top left quadrant of 16 x 16 sprite
p = 5 Defines bottom left quadrant of 16 x 16 sprite
p = 6 Defines top right quadrant of 16 x 16 sprite
p = 7 Defines bottom right quadrant of 16 x 16 sprite
ch must lie within the range of p

MTX Graphics Functions

SPK
Peeks the character at current cursor location, puts the character into a previously DIMensioned string array, auto increments the cursor position and repeats this until the string is full GR$ x,y,b
Reads bits directly off the screen
x,y are co-ordinates on the virtual graphics screen (4095 x 4095)
b is the number of vertical bits read in a downward direction
DSI
Direct screen input
Allows the user to roam about freely within the screen, ending when carriage return is pressed. Control W tabs back, control ĵ switches the cursor on, control underline switches the cursor off, control D followed by letters A to O changes paper colour (A to O = 1 to 15), control F changes ink colour as for paper, ESC I inserts a line, ESC J deletes a line, ESC K duplicates a line

Front Panel Display commands

B followed by Y (i.e. BASIC, then Y/N) returns user to BASIC
C clears the List screen
D displays memory in hexadecimal
G (go) runs a block of code defined by the user
I cycles the display between ASCII characters or machine code values currently in memory
L lists memory contents from a given hex address
L. lists memory contents from current Program Counter address
M moves a block of memory to a given address
R alters contents of a given Register
S single steps through code from current Program Counter address
T as above but treats Calls as one instruction
X displays alternate Register set
. moves Register cursor
- moves memory display cursor backwards
<enter(moves memory display cursor forwards
_ moves display up
↓ moves display down
<brk> stops a program and displays register contents

MTX Assembler commands

The assembler is invoked by typing ASSEM line number e.g. ASSEM 100 or ASS. 100 This tells the computer to insert a CODE line at BASIC line 100 The word ASSEMBLE will appear at the bottom of the screen

To insert code type <return>. The instruction occupying the location of the current BASIC line will be displayed. This can be overwritten, or retained by pressing <return> To exit press the CLS key followed by <return>

E (line number) allows you to edit the line number entered
L (line number) lists from the line number entered
T. moves to top of code
T. <return> followed by L. lists from top of code. Pressing <page> will temporarily halt listing
P. prints to printer
B returns to basic and assembles the code

MTX Series Disc Based Systems

Disc Options

The MTX computers support a range of mass memory storage devices using one of two types of disc system. These are the

FDX Floppy Disc System

and the

HDX Winchester Disc System

Both of these systems require the communications board expansion within the MTX computer, and a minimum of 64K RAM. Both systems have the following features:

A 19 inch wide chassis comprising four black anodised brushed aluminium extrusions. Black powder coated end plates are each secured by six screws. The chassis contains a card cage which can accomodate:

One computer expansion board
One Colour 80 column board
Four silicon disc memory boards
One floppy disc controller board

An integral power supply which also powers the MTX computer.

Inputs can be 240/220 VAC 50/60 Hz or 110/115 VAC 50/60 Hz. An illuminated on/off rocker switch is located on the front face. Parallel port for bus expansion

Two slots are provided on the front face for horizontally mounted five and a quarter inch disc drives.

External battery backup facilities are optionally available

A license to use the Digital Research Inc. CP/M 2.2 operating system is provided with the FDX and HDX systems.

Colour 80 column board

Mounted in the FDX or HDX systems the board permits the use of colour programs requiring an 80 column screen running under CP/M 2.2, such as Colour Wordstar. Also available is the wide range of existing CP/M based software.

Input and Output

RGB monitor output with selectable positive/negative sync. Monochrome composite video output, 1V peak to peak, negative sync.
Light pen input
Single channel sound
Screen display formats:
80 columns x 24 lines text (max)
160 x 96 graphics mode
Two alternate 96 element character sets with true lower case descenders.
4K ROM based graphics characters
Teletext compatability
High speed glitch free screen update (average 25 000 baud)
The Colour 80 column board provides a complete emulation of a CP/M terminal via ROM software, and features:
Full cursor control
Vector plot, point plot
Powerful editing facilities with screen dump
Complete attribute control for colour and monochrome displays

Silicon Discs

These are a quarter or one megabytes fast access RAM boards which are full emulators of CP/M drives 0 to 13. Four silicon discs may be mounted within the HDX or FDX chassis, providing from one to four megabytes per card frame. However, the silicon disc controllers can supervise four logical drives, of up to eight megabytes each giving a maximum silicon storage of 32 megabytes. This is in addition to the four five and a quarter and/or eight inch conventional floppy disc drives handled by the floppy disc controller board. Numerous advantages include:
Speed - up to five times faster than a Winchester disc, and fifty times faster than a floppy disc.
A dramatic increase in efficiency of proven eight bit CP/M software to 16/32 bit software levels, obviating the need for complex and costly memory management techniques
Permits single floppy disc CP/M system which is ideal for database manipulation, word processing and compilation
Greatly reduces disc wear and prolongs life of mechanical disc drives, enhancing reliability especially in disc intensive transactions.

Floppy Disc Controller Board

This board uses the full Western Digital 1791 chip set and supports most CP/M floppy drives, types 0 to 13, which range from single sided single density five and a quarter inch floppies to double sided double density eight inch floppies, using SASI (Shugart) standard interfaces. Any combination of four SASI compatible drives can be controlled. The WD 1791 controller set together with a bipoler DMA controller provides a high speed processor interface minimising latency and facilitating rapid data transfer especially on high capacity discs. Variable and fixed write precompensation is software selectable. Bus extenders permit the connection of external floppy drives.

HRX SYSTEM

The HRX system is a computer graphics package which has been developed for picture and image processing. The basic monochrome system uses one colour plane and gives four pages of 256 × 256 × 8 bit storage. This gives 256 grey levels per pixel. By placing two pages side by side the system can display in its wide screen format 384 × 256 pixel resolution.

The display is standard 625 line 50Hz interlaced format to allow compatibility with UK TV standards. It is possible to view any of the stored pages, to view two pages side by side in wide screen format or to interlace pages together. The colour system uses three colour planes (R, G, and B) to provide 2^{24} or 16 million colours per pixel. This is more than is required for the display of a colour TV picture (250,000 colour shades). The extra storage allows for picture processing which can enhance or point out features of the picture previously indistinguishable.

The HRX system is designed to allow direct TV or camera input into its frame store. The system has a set of A-D converters which take work at video speed and a faster method of interleaved DMA storage which allows data to be written into a colour system at video frame rate. (88M bits per second). This facility allows for the system to grab video frames from a video system or TV camera. It takes place in real time and by the use of a palate look-up table the HRX system can perform real time contrast enhancement or video colour transformations. By re-displaying the information stored in the frame store memory an instant appreciation of the colour and contrast transformations can be seen.

In addition to the real time processing as described above a software package operating on the MTX Series computers allows the graphic system to perform fast off-line processing of stored pictures. The system can perform all features offered by standard graphic systems, such as dot and vector drawing and other line-oriented functions, but also offers very powerful picture processing functions.
Once a picture is held in the HRX frame memory, software allows the processing of the picture in many ways, for example you can:

zoom	in an area of a picture
shrink	a picture to small size
rotate	a picture
detect edges	in a picture
filter	perform two-dimensional filtering on a picture
average	two pictures
change	contrast and brightness of a picture
enhance	the edges of a picture
change	the colour cast or complete colour change of a picture
save	a picture on disc
retrieve	a picture from disc
logical operations	perform logical operations on a picture or pictures

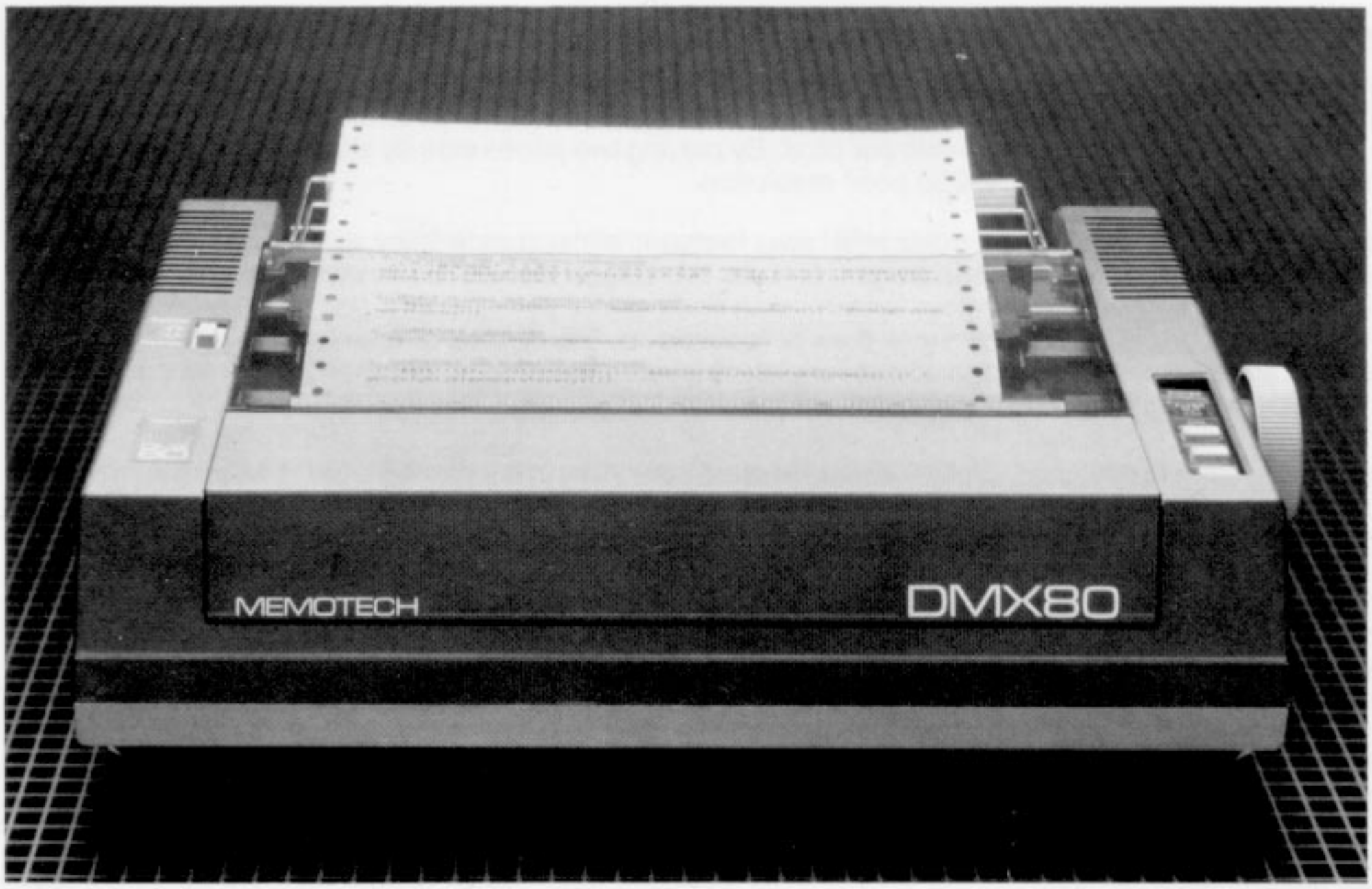
This is not a comprehensive list but gives examples of the software. End user applications software is easily implemented in BASIC, PASCAL, or Z80 on the MTX Series. The applications of the machine are many and include:

1. Graphic design (right up to a full typesetting capability)
2. Picture composition
3. Image enhancement in many forms
4. Simple animation
5. Page layout design
6. Component testing

The HRX graphics computer involves a new type of computer graphics which opens up avenues previously closed to conventional graphics systems.

MEMOTECH

MTX SERIES



DMX80 Printer

Bidirectional minimum-distance access cartridge.

Compact cartridge-type ribbon designed for long life and easy replacement.

Seamless, continuous ribbon surface provides uniformly outstanding print quality.

Precision print head utilizes special wires for sharp, quality printing and greater durability.

Underlining, elongated characters and skipping between characters.

The Memotech DMX80 printer is under application for UL and FCC approval.

SPECIFICATIONS

PRINTING CHARACTERISTIC	
Matrix	9 x 9
Character set	Full 96 character ASCII with descenders + 62 customer specified chrs

CHARACTER STRUCTURE	Horizontal	Vertical
Normal	5	9
Graphics	6	7
Elongated	10	9

PRINT METHOD	Serial impact dot matrix
CHARACTER SET	Pica Elite
PRINT SPEED	80 cps 96 cps
PRINT DIRECTION	Bidirectional with logical seeking Unidirectional in the bit image mode
HEAD SIZE	9 pin
HEAD LIFE	150 million characters + pins
LINE SPACING	4.23 mm (1/6") and 3.18 mm (1/8"), n/72", n/144" programmable

BIT IMAGES	
(1 line x Ver.)	Standard 576 x 8 Double density 1152 x 8
PRINTING SIZES	Selectable by DIP SW or programmable

	Characters per inch		Characters per line	
	Pica	Elite	Pica	Elite
Normal	10	12	80	96
Elongated	5	6	40	48
Condensed	14	17	113	136

MEDIA HANDLING	
Paper Feed	Adjustable sprocket tractor feed and Friction feed.
Paper Width Range	Sprocket or single sheet paper from 4" to 10"
Copies	3 (Original Plus 2 non-carbon copies)
Paper Path	Rear
INTERFACES	
Standard	8 bit parallel
Optional	(4K Buffer Parallel) (RS232C + 2K Buffer)
NOISE LEVEL	60 dB
ENVIRONMENTAL CONDITIONS	
Temperature Range	5°C to 40°C (41°F to 104°F)
Operating Humidity	20% to 80% non-condensing
POWER REQUIREMENT	
Voltage/Current	240 V AC 50 Hz/1 Amp
Power Consumption	240 VA
PHYSICAL CHARACTERISTICS	
H x W x D	115 mm x 399 mm x 286 mm
Weight	7.0 kg (15.47 lbs)

Interactive Node Ring

The MTX Node Ring system can support up to 255 "nodes", which are essentially MTX series computers, fitted with the MTX Ring ROM, and uses one channel of the two channel RS232 communications board. The Ring is constructed using simple three-wire cables. A typical system might be an FDX Floppy Disc System acting as a "master" controlling a number of MTX 500/512 "slaves".

All node commands are written in BASIC and are therefore simple to use and understand.

MTX Node Commands

BAUD	ERROR	MSEND	SEND
CALL	EXT	NAME	SET
CANCELQ	FLAG	OFF	STAT
CLEAR	FORMAT	ON	STRING
CLEARQ	GOSUB	POST	SUSPEND
CONT	LIST	PRINT	
DIR	MAIL	PROGRAM	
DISPLAY	MESSAGE	RCV	
ENTER	MRCV	RESTORE	

Messages can be transmitted around the Ring and stored selectively in nodes, and then printed on a printer.

Data can also be transmitted as BASIC strings or as blocks of memory. Each node can specify what it wishes to accept or reject and commands can be enabled or disabled within a specific node. Any node can set up the above conditions within any other, so that BASIC programs can be sent to any or all other nodes, and auto-run if required.

The Ring has a monitor which displays messages on screen as they are received, along with information on the Ring status.

The second channel of the RS232 Communications Board can be used to join two Ring systems together.

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