The MMBASIC User Program Library contains programs written or modified to run on the Maximite family of computers. They are provided for the benefit and edification of the Maximite community, without any warranty as to suitability for any use. They are free of any copyright and may be copied, modified and distributed as you see fit. Enjoy them and learn.

If you have written a program for MMBasic and you believe that it is worth sharing with the world please send it to mmlb@geoffg.net and include a short (2 to 4 line) description of what the program does for the library index either in the email or in comments in the code. If you modify one from this library and see a benefit in your mod for others, by all means submit it for inclusion. Please acknowledge the source if it is not all your own work.

Note that many email systems will refuse to transmit a file with an extension of .BAS so you may need to append .TXT to the file name before attaching it to the email.

For up to date errata, notes and news of MMBasic go to http://geoffg.net/maximite.html

In this listing, programs have been categorised to help you find what you want:

- **Colour Maximite programs** a collection of programs demonstrating features of the Colour Maximite. In some cases they are updated versions of programs in other categories.
- **Control and Monitoring** do exactly that and require external connections and/or hardware. They are often associated with magazine articles. e.g. Silicon Chip
- **Games** generally do not require any external connection - MagicBox is an exception
- **Stand Alone Applications** do not require external connections
- **Techniques and Demonstrations** show off MMBASIC capabilities and coding solutions
- **Tools** are programs to help with coding or running Maximite

All programs in the library should run on the Colour Maximite under the latest version of MMBasic. Only those in the Colour Demos and ColourMM Library folders take advantage of the additional features of the Colour Maximite.

What's New

B&W Maximite Programs

Added	PotTest	A program to calibrate a potentiometer
Added	PSYCTEST	A port of an old psychology test

Table of Contents

Colour Maximite programs

All programs in this category require
MMBasic v4.0 or later.

Colour Demos

CMM4_TST a test program that demonstrates various graphics on the Colour Maximite running in MODE 4. These include coloured lines, boxes, circles and moving images on the screen using the BLIT command.
Author: Fabrice Muller

A collection of ColourMM demos from Geoff Graham demonstrating features of the ColourMM.
A readme.txt file in the folder explains each.

Colour-1 - draws random colour-filled circles

Colour-2 - demonstrates the MODE command

Music - plays a sequence of music files

Julia - plots a Julia fractal set in colour

ColourMM Library

Clock-C - a ColourMM version of CLOCK. You will find it in the Analogue Clock folder.
A collection of ColourMM programs by Fabrice Muller of France demonstrating features of the ColourMM.
A readme.txt file in the folder explains each.

Arcade - an arcade game with sound

Breakout - shows how to use BMP, sprites, files, arrays and potentiometer input.

Invaders - A colour version of Space Invaders.

Lander - A moon lander with sound and random moon terrain.

Sprites3 - shows coding methods for sprites, blitter and music.

Control and Monitoring

BATTERY

This is the battery capacity tester described in the Silicon Chip May 2011 article "Using The Maximite". It uses 4 relays to control the battery load.
Refer BATTERY.JPG for the circuit diagram.
Author: Geoff Graham

BATTERY2

An extended version of the battery capacity tester described above. Additional features include:
- Draws a graph of the battery voltage on the video output as the test progresses
- Choice of constant current, power or resistance load
- Optionally saves the data in an Excel compatible file
- Optionally uses 5 relays for a finer level of load control
Author: Geoff Graham

COILWIND

Describes the development of a coil winder using pulse width modulation to control motor speed and a Hall Effect transducer to count coil turns. There is a YouTube demonstration of the completed device and schematics of the interfaces. Have a look at the "I built a coil winder" document.
Latest version PWMS.BAS added 12/6/2012
Author: Ron Pugh

CVanBM

I started as a caravanner wanting a good/better method of monitoring the status of the van batteries, the solar charging system and how long till "brownout" when free-camping. This is a work in progress.
The CVanBM folder contains program, circuit diagram and explanation.
Author: Douglas Pankhurst

FRIDGE

This is the refrigerator temperature monitoring program described in the Silicon Chip May 2011 article "Using The Maximite".
Refer FRIDGE.JPG for the circuit diagram.

GPS

An example of how to get data from a GPS module using the serial interface. Shows how to extract the individual fields from the data.
See http://home.mira.net/~gnb/gps/nmea.html for details of the GPRMC string produced by a GPS and http://geoffg.net/maximite.html for a number of GPS applications.
Author: Geoff Graham

I2C

Example of using the I2C protocol to get the temperature from a DS1621 sensor. The full description can be found at:
http://www.thebackshed.com/forum/forum_posts.asp?TID=4112&TPN=1
Author: Geoff Graham

I2CLCD

This code is for driving a standard HD44780 character LCD using the I2C interface and a PCF8574. The circuit diagram is in the code.
Author: John Gerrard

I2CTIME

Sets and reads time from DS1307 real time clock.
Author: Ian Quirk

PotTest

A program to calibrate and read the value of a potentiometer connected between Maximite I/O pins 8 and 10.
Author: Graeme Anderson

PWM

A "pwm" program with several variables it can be used to run an inverter or what ever you may find suitable for it.
If you have problems getting it to run, try installing the hex MMBasic ver 2050 provided (author unknown - possibly Gerard).
The main buss "a" will depend on the primary input voltage...everything else speaks for itsself...
Author: Gerard Sexton
Submitted by: *sparkey265@hotkey.net.au*

Games

CHECKER

A game based on the old 'One Check' solitaire checker game from creative computing.
Author: Bill Brown

HAMURABI

The game of Hamurabi. You can try your hand at governing ancient Sumeria for a 10-yr term of office. It was popular on the Tandy TRS-80 computer many years ago.
Author: David Ahl
Ported: Peter Turnbull

HEARTS

A version of Hearts and Bones, similar to the one on the HP 200LX Palmtop Computer in 1991. Capture as many Hearts as you can without stepping on a Bone. In many ways it is like Minesweeper.
Author: Hugh Buckle

HIGHIQ

A game based on the program high i-q from creative computing.
Origin: Creative Computing
Ported: Bill Brown

INVADERS

This is a version of the Space Invaders game for the Maximite.
It must be run using MMBasic v3.0A or later as it relies on some advanced features of this version to control the invaders. It looks best if played on a composite PAL monitor but it will also run fine on a VGA monitor.
Author: Fabrice Muller (France).

MAGICBOX

This is rewrite of the magic switchboard program to suit MMbasic.
This program uses the four switches connected to pins 11, 12, 13 and 14 and the output (either white LEDs with colour tops or 6Vcoloured lamps) connected to Pins 15,16,17 and 18. The lamps will require driver transistors. You can see a demonstration on YouTube at *www.youtube.com/watch?v=0lGP8nQLANU*.
Origin: Picaxe technical for the picaxe 18x
Ported to MMbasic by Bill Brown

MAGICSW2

Another version of Magic Switchboard based on Bill Brown's port to MMBasic.
Author: Keith Williams

MAXMAN

The game of PacMan rewritten by Nick Marentes for Maximite.

MMFOUR

A port of the old Microbee game of Connect Four.
Ported: Glenn Littleford

MMPREY

A short graphical environment simulation
Ported from a old Apple II program in ETI magazine 1982
Author: Phil Cohen ETI
Ported: Glenn Littleford

MMSUDOKU

SUDOKU v1.0 for Maximite MMbasic v3.1 by Raros/BFTI from an idea by Digitalquirk for the Vic20. There are two versions; one with a graphical intro and the other that goes straight to the game. Well worth a try.
Author: Raros on The Back Shed forum

NUMBERS

A simple memory test program whereby a number appears on the screen and you must type that number within the time limit. Each time you answer, the number grows by one random digit.
You can go into the program and lengthen the time the numbers are displayed... but they get quicker as time goes by.
Author: Frank Papadopouios from an old magazine
Submitted by: sparkey265@hotkey.net.au

REVERSE

A simple game that challenges you to set a row of numbers in order in the minimum of moves.
Origin: Creative Computing

Functions and Subroutines

BIN8

A library of functions and subroutines that perform bit manipulation on 8 bit numbers. The routines include left/right shift, bit set/clear and more.
Written by crackerjack.

BBLSORT1

A bubble sort is a very simple technique for sorting an array. It is efficient for small amounts of data.
This two subroutine sorts a text array into ascending Non-case-sensitive sequence. See the note in the code about the collating sequence, which can easily be changed to sort into case sensitive or numeric sequence.

Because MMBasic cannot yet pass whole arrays by reference (hopefully it will one day), it cannot be included as a defined subroutine so you will need to replace the array name with the one you wish to sort. Requires MMBasic v3.1 or later due to use of defined subroutine SWAP x,y.
Ported from GW-Basic by Hugh Buckle

BSEARCH1

A Binary Search routine for a text array, which has been sorted in non-case-sensitive ascending order.
A binary search routine is an efficient way to find a matching value in a sorted array.
If a matching value is found, it returns the array index in Indx and sets the variable Found = 1. If not, it returns Found = 0.
You can easily modify this routine to search a case-sensitive sorted array or a numeric array. See comments in the program.
Because MMBasic cannot pass arrays by reference to Defined Subroutines, you will need to change the array name to the one you wish to search.
Author: Hugh Buckle

Stand Alone Applications

ALPHANUM

Alphanum was written as an aid to solving cryptograms, in that it helps to know which are the most common letters and double letters in a typical document. It reads a plain text document (.txt) and counts the number of times each letter appears in it and the number of times each double letter appears. Counts of each letter and double letter are written to a .CSV file so that they can be input to a spreadsheet such as Excel or OpenOffice Calc for further analysis and the percentage of each letter and each double letter is shown in a bar graph.
Subsequent executions of Alphanum can accumulate totals by adding counts from this document to counts in the .CSV file from previous runs. In this case, the bar graphs first show the results from the input text document on its own and then from the accumulated totals. You can toggle back and forth between the two pairs of graphs to highlight the changes.

Analogue_Clock

An animated analog clock complete with second hand.
Drawn using the graphic capabilities of MMBasic.
CLOCK.BAS is a version for the B&W Maximite.
Author: Eugene Villar
Ported: Bob Devries
Modified: Hugh Buckle
CLOCK-C.BAS was modified by Geoff Graham for the Colour Maximite.

DATE_DAY

The Gregorian calendar came into use in 1582, so day of the week for a particular date is not relevant for dates prior to the year 1582, although this program will generate a day of the week from the year zero to the year 9999.
Author: Theo Reimer

DIVTEST

Division practice for 6 year olds. See Basic Divide Program on the Back Shed forum.
Author: YT2059 on The Back Shed forum
Modified: Hugh buckle to remove line numbers and substitute DO loops for GOTOs.

MORSE

This will generate Morse code for any message that you type in. It will flash the front panel power LED and generate a sound (you need to connect amplified speakers to hear the sound).

PSYCTEST

This program is just for a bit of fun. It is a psychological type testing program that the author modified for MMBasic from some old program that he had had floating around for about 25 years. The coding techniques may be interesting and useful.
Author: Graeme Anderson

Techniques and Demonstrations

1WDS1820

Based on ONE-WIRE.BAS this program uses the 1-wire protocol to determine which version of the Dallas DS18x20 family is connected to the 1-wire bus and the method of connection, ROM code and temperature. Using this information you can easily devise a program using the ROM codes to interrogate multiple devices on the same 1-wire bus without the need to use a ROM Search routine.
Author: Ian Delaney

BBLSORT

Demonstration of the Bubble Sort routine BBLSORT1.
Author: Hugh Buckle

BIGINT

A demonstration of MMBasic's ability to handle large integers. It uses integer maths to calculate 1, 1×2, 1×2×3, 1×2×3×4, etc., the successive factorial numbers. The limit in MM Basic is the length of a string or 255 digits. At this stage, only positive integers are allowed as inputs. Now I need to go the next step and allow negative numbers.

This code is SLOW and I have not made any attempt to speed it up. Working in base 1000 (3 digits at a time) is the obvious way to gain speed but this exercise was a proof of concept rather than good code.
It needs MM Basic V3.1 as it uses user defined subroutines.
Author: TassyJim on The Back Shed forum 7/2/2012

BSEARCH

Demonstration of the Binary Search routine BSEARCH1.
You could use BSEARCH in conjunction with the Bubble Sort which is also in this library as Hugh has done in this demonstration code.
Author: Hugh Buckle

DATALOG

This is a demonstration of how the Maximite can be used as a datalogger. Pins 1 to 10 are set as analogue inputs while pins 11 to 20 are set as digital inputs. The data is written once every second to the file "DATALOG.XLS". This is an Excel compatible spreadsheet file.

DATE_DAY

DAY OF THE WEEK FOR ANY DATE
Developed January 2012 for MMBasic 3.1
The Gregorian calendar came into use in 1582, so day of the week for a particular date is not relevant for dates prior to the year 1582, although this program will generate a day of the week from year zero to the year 9999.
Author: Theo Reimer

FUN1WIRE

A demonstration program that shows how to get the temperature from Dallas DS18B20. It is similar to ONEWIRE.BAS except that it uses a function instead of a subroutine.

GRAPH

This is a demonstration of the Maximite's capability for drawing graphs on the video display.

LCD & LCD_1

A driver for standard 16 x 2 LCD displays. Note: This has been updated for MMBasic 3.1 and uses defined subroutines which are much easier to use. The first few lines are an example of how to use the driver. Refer to the file LCD.pdf for details of how to connect the LCD to the Maximite.
James Deakins says the updated version, LCD_1.BAS, works with 20 x 4 displays, and should work with 16 x 1 and 8 x 1 displays , although he hasn't tested them. It may even work with a 40 x 4.
Author: Geoff Graham

Updated: James Deakins

MCP_POT

Small program that demonstrates using the SPI functions to communicate with the MCP4xxx rang of chips from Microchip. These chips include one or two digitally controlled potentiometers and they give the Maximite the ability to adjust a potentiometer from within a MMBasic program.
Author: Geoff Graham

ONE-WIRE

A demonstration of using both the defined subroutines and 1-wire features introduced in version 3.1. This subroutine encapsulates the code necessary to get the temperature from a Dallas DA18B20 temperature sensor. If you include this subroutine in a program it will be the same as adding a temperature measuring command to MMBasic.
Author: Geoff Graham

PWMSIN and PWMTRI

Two interrupt driven programs to blink the front panel LED. Both use pulse width modulation to produce a 'soft' flash. Rather than just switching the LED on and off by toggling Pin 0 and pausing in between, this program effectively modulates the width of pulses sent to Pin 0 so that the LED appears to shine brightly, dims again then repeats.; PWMTRI uses a triangular wave whereas PWMSIN uses a SIN function.
You could use this code to indicate that a program is still running.
Author: Graeme Anderson

SSTRING

Code that demonstrates a way of storing small strings efficiently. Normally each string takes up 255 bytes. With this method each string takes up less space.
See SString,readme.txt in the library for a full explanation.
Author: TassyJim from The Back Shed

TWINKLE

A demonstration of the Maximite's ability to turn on and off any pixel.

Tools

AUTORUN

A sample file demonstrating the use of AUTORUN.BAS to setup options in MMBasic on startup. This example includes loading often used commands into the programmable function keys and setting the prompt.

BMPSHOW

A program for loading and displaying bit map images (BMP format). The zip file includes some images to practice on.
Author: Bruce Mitchell

BENCHMRK

A series of benchmark tests derived from those published by the US magazine Kilobaud in 1977 that could be used on any version of BASIC and would give an idea of how fast the computer ran. With slight modifications and the addition of an eighth test these 'benchmark' programs were adopted by the UK magazine Personal Computer World and all their computer reviews were accompanied by a list of the benchmark timings.
Ported to MMBasic by Rob Severson
For further information see
http://en.wikipedia.org/wiki/ABC_800
and
http://www.geocities.ws/peterochocki/computers/pcwbm.html

HEXDUMP

Dumps a text file to the screen in hex and ascii. Useful for analysing a text file contents.
Author: Douglas Pankhurst
See also TEXTLOOK in this library.

KEYBOARD

This program will show you the codes generated when various keys on the keyboard are pressed. Use this to find the codes associated with special keys such as the function keys.

MAXIFONT

A full screen editor for creating and editing font files. Several versions added.
Author: Dennis Wyatt

Maxi-Menu

A program launcher styled in a somewhat Ipod fashion with icons that the user selects from to launch their desired application.
Author: Nick Marentes

NONUMBER

Removed - out of date - contact mmlib@geoffg.net for the last available version. Please note that it does not handle all situations successfully.

PAGELIST

This lists any text file to the screen page by page, accounting for wrapped lines.
Similar to LIST, but not confined to loaded .BAS files.

It is useful for looking at text files generated during data acquisition on the MM itself.
Emulates Unix PAGE from the 1980s.
 Author: Rodney Entwistle

TEXTLOOK

This reads any text file character by character and dumps each character to the screen, which then pages

the output. The printables are echoed and the non-printables listed by their ASCII codes.
It is useful for seeing exactly what is in a text file (e.g. tabs).
Emulates a similar Unix program from the 1980s.
Author: Rodney Entwistle
See also HEXDUMP in this library.

Change Log

11-11-2012

Added	PWMTRI	Pulse width modulation of the front panel LED using a triangular wave
Added	PWMSIN	A variation of the same program but using a SIN function

24-10-2012

Added	hexdump	Dumps text file to screen in hex and text
Added	CVanBM	Solar charge and battery monitor for caravan
Updated	Music.bas	Fixed a fault in Music.bas in Colour Demos
Added	SString	Demonstrates a way of storin small strings effiently

28-08-2012

Colour Demos folder

Added	CMM4_TST	A test program that demonstrates various graphics on the Colour Maximite running in MODE 4.

ColourMM Library folder

Added	Clock-C	A version of Clock for the ColourMM - Find it in the Analogue Clock folder
Added	Lander	An updated version of Lunar Lander
Added	Invaders	A colour version of Space invaders.

B&W Maximite Programs

Added	BigInt	Somehow was left out of the last update.
Updated	Clock	In Analogue folder. Minor changes.
Removed	Nonumber	No longer handles all situations - contact mmlib@geoffg.net for last available version.

21-8-2012

This is the first distribution of the Library with programs for the Colour Maximite. They are all contained in 'Colour...' folders and for these you will need to download MMBasic v4.0 or later.

Colour Maximite Programs		These programs all require MMBasic v4.0 or later.
Added	Colour Demos	A set of programs from Geoff Graham demonstrating new colour features. A readme.txt file explains the purpose of each
Added	ColourMM Library	A set of test programs from Fabrice Muller of France demonstrating Colour Maximite features. A read me in ColourMM Library explains each demo.

B&W Maximite Programs		These programs all require MMBasic v3.2C or later
Added	BigInt	Somehow got left out of the last update

20-7-2012

Added	Numbers.bas	A simple memory test
Added	PWM.bas	to run an inverter or other like application

12-6-2012

Added	PWMS.BAS	to Coilwind folder - the latest version of Ron Pugh's coil winder control program

18-4-2012

Added	Bin8	A library of functions and subroutines that perform bit manipulation on 8 bit numbers
Added	Fun1Wire	Demonstrates how to get temperature from Dallas DS18B20
Added	Hearts	The game of Hearts and Bones found on HP 200LX Palmtop Computer circa 1991

Added	MCP_POT	Demonstrates using SPI functions to communicate with MCP4xxx range of Microchip chips

6-4-2012
Added	I2CLCD	code for driving HD44780 character LCD using the I2C interface and a PCF8574
Added	MAXMAN	PacMan game ported to MM by Nick Marentes
Added	1WDS1820	uses the 1-wire protocol to find which version of the Dallas DS18x20 family is connected

12-3-2012
Added	COILWIND	Coil winder using PWM motor control and Hall Effect turns counter.
Added	PAGELIST	Lists a text file to the screen, wrapping long lines.
Added	TEXTLOOK	Dumps a text file character by character to screen; non-printables in ASCII.

4-3-2012
| Added | I2CTIME | Sets and reads time from DS1307 real time clock |
| Updated | MAXIFONT | Several new versions added including one without line numbers. |

25-2-2012
Added	MMSUDOKU	Sudoku for Maximite from Raros of the BlackFire Team Italy
Added	BENCHMRK	Benchmarks devised by Kilobaud magazine & adopted by Personal Computer World
Added	DATE_DAY	Returns the day-of-week for any given date
Added	DIVTEST	A program for young children to practice simple division
Updated	MAXIFONT	Several new versions added including one without line numbers.
Updated	LCD_1	An update to LCD which should support larger displays

10-2-2012
Added	BIGINT	Shows MMBasic can do big integer maths. Calculates integer factorials to 55.
Added	DATE_DAY	Print day of the week for any date from year 0000 to 9999.
Added	MAGICSW2	Alternative version of Magic Switchboard
Updated	LCD	Supports 20x4 displays. Should work with 16x1, 8x1 and possibly 40x4.
Updated	BATTERY	To set default values if <enter> pressed
Updated	BATTERY2	Corrected output file name and minor formatting changes

Note: Some of these additions and updates require MMBasic v3.1 or later because they use a defined subroutine.

29-1-2012
Added	BSEARCH	A binary search routine to find a matching value in a sorted array.
Added	MAGICBOX	A seemingly magic device ported from PicAxe - uses external hardware
Added	ONE-WIRE	A demonstration of using both the defined subroutines and 1-wire features
Updated	BBLSORT	With a defined subroutine mimicing GW-Basic SWAP x,y
Updated	NONUMBER	To fix a problem when the is more than one reference to a line number plus support for keywords Open, I2CEN and I2Sen.

Note: Some of these additions and updates require MMBasic v3.1 or later because they use a defined subroutine.

18-1-2012
Added	INVADERS	Space invaders game
Added	MAXIFONT	Font editor
Added	NONUMBER	Removes line numbers and replaces with labels where necessary
Added	ALPHANUM	Aid to cryptography - Shows percent of each letter in text documents
Added	BBLSORT	Bubble sort taken from GW-BASIC on-line manual
Updated	CLOCK.BAS	to ask for date and time.
Updated	BATTERY2	To allow <enter> key to select default values
Updated	MMPREY	Minor fix
Removed	RENUMBER	No longer relevant
Removed	TESTPINS	A test program