



USER MANUAL
ENGLISH

TURBO 40 & 50

COMMODORE 64/128

TURBO 40 & 50

INTRODUCTION

Welcome to one of the unique range of ROBCOM TURBOTOOL products that you have just bought. You are in possession of a highly sophisticated product that will help you to use your Commodore computer to its full capacity. To be able to enjoy the full benefits of this cartridge it is important that you read the instructions carefully.

SETTING UP THE ROBCOM CARTRIDGE

1. Turn the computer off, before you insert the cartridge.

WARNING : NEVER INSERT OR REMOVE YOUR ROBCOM CARTRIDGE WHILE THE POWER TO THE COMPUTER IS ON. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN PERMANENT DAMAGE TO THE CARTRIDGE OR THE COMPUTER.

2. Plug the cartridge into the cartridge port at the back of the computer, ROBCOM LOGO uppermost.

3. Do not force the cartridge, as it has been designed to TURBOTOOL startup message will now appear on your screen.

6. The ROBCOM cartridge is now ready for use.

USEFUL TIPS

1. If you want to see all the additional commands that are available with this cartridge, type in the command SHOW <RETURN>.

2. If for some reason you do not want to use the cartridge anymore, instead of turning the computer off type in the command QUIT <RETURN>.

3. If for some reason your computer will not respond to any command or action, just press the RESET BUTTON on the side of the cartridge. The normal startup screen will now be displayed without having to turn the computer off and on.

RESET BUTTON

The RESET BUTTON is one of the most important and certainly the easiest feature of the cartridge to use. If your computer locks up while testing or running a program in Basic or Machine-Code, the RESET button will return you to your initial startup screen. If you use the OLD command it is always possible to retrieve your Basic program. Also in lots of cases it is possible to retrieve your Machine-Code program as well. This means that not only can you reset your computer without turning it off and on, but you can also retrieve programs that you normally would have lost. Therefore not only does it save you a lot of time and work, but it will also save wear and tear on your computer.

ROBCOM COMMANDS

TOOLKIT	: AUTO HELP PLIST RESET DUMP (not available for ROBCOM cartridge TURBO 50)	DEC HEX QUIT SET	DEL KEY RENUM SHOW	FIND OLD REP TRACE
DISK	: DLOAD FLOPPY	DMERGE .	DSAVE /	DVERIFY 1
CASSETTE	: PUT MERGE	PUT*	GET	COMP
COPY	: COPY	RECOPY	DEV.	
CENTRONICS: CENT COLUMN (Centronics commands are not available in ROBCOM cartridges TURBO 20 and 30)				
MONITOR	: ASSEMBLER EDITOR INTERROGATE MEMTOP QUICKTRACE VIDEO + !	BREAKPOINT FILL JUMP NEWLOCATOR REGISTER WALK - ?	COMPARE GO LOAD ORIGIN SAVE EXIT \$ #	DISASSEMBLER HUNT MEMORY PRINTER TRANSFER ZIP % >

(Monitor commands are not available in ROBCOM cartridges TURBO 10 and 30)

All 8 function keys are pre-programmed with very easy & useful commands.

COPY" ",2,2	COPY" ",2,8	DLOAD	PLIST
GET	HELP	QUIT & RUN	RUN

GUARANTEE : THIS ROBCOM CARTRIDGE IS PROTECTED BY A SIX MONTHS GUARANTEE. IF THERE ARE ANY PROBLEMS CONTACT YOUR LOCAL DEALER WHERE YOU PURCHASED THE CARTRIDGE.

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BASIC TOOLKIT

The range of commands provided make it an essential tool for anyone interested in getting more from the Commodore 64 Basic. This Toolkit has not been designed to teach you Basic programming, but to aid you to write in a simple, fast and efficient way. The Toolkit is divided into two sections :
1. Beginners and 2. Advanced.

SECTION 1 : BEGINNERS BASIC TOOLKIT

This section is for people who can already write simple Basic programs.

AUTO

This command is designed to automatically create program line numbers with a specific step size. This command is very useful because you never have to number your program lines which saves time and eliminates the chance of a mistake. There is no longer the problem of using the same line number twice and losing the information that was in the first.

TRY THE FOLLOWING EXAMPLE :

TYPE IN : AUTO 10,5 <RETURN>

DISPLAY : 10

TYPE IN : PRINT"ROBCOM" <RETURN>

DISPLAY : 10 PRINT"ROBCOM"
15

To terminate this command simply press <RETURN> when the line number is displayed.

RESULT : Each time you enter a line of code and press <RETURN>, a line number 5 larger than the previous number is displayed.

If you type in AUTO <RETURN> without any numbers the computer will automatically start at line 100 and increase all lines in steps of 10.

DEL

The DEL command allows you to delete lines from a Basic program in the computer memory. It is possible with this command to delete a certain range of lines in a program. The great advantage is that it is now possible to delete more than one line at the same time. Normally to delete a line in a program you must type in the line number <RETURN> for every single line that you want to delete. Now you will not only save a lot of time, but it will mean that chance of deleting the wrong line is much smaller.

EXAMPLES : TYPE IN RESULT

DEL 50- <RETURN>	deletes only from line 50 until the end
DEL -50 <RETURN>	deletes from beginning until line 50
DEL 50-200 <RETURN>	delete lines 50 to 200

FIND

The FIND command is used to search a Basic program for certain information that you are looking for. It is no longer necessary to search for the same information line by line. It

is now possible to search the entire program (straight away) for information that occurs more than once using the FIND command.

TRY THE FOLLOWING EXAMPLE :

```
TYPE IN : 10 REM TURBO <RETURN>
          20 PRINT "TURBO" <RETURN>
          30 AS="TURBO" <RETURN>
          40 FOR X=1 TO 10 <RETURN>
          50 PRINTX <RETURN>
          60 NEXT <RETURN>
```

TYPE IN : FIND "TURBO" <RETURN>

DISPLAY : Lines 20 and 30 will be shown

RESULT : Each line of the program containing the word "TURBO" enclosed within quotation marks is displayed. Note that line 10 is not displayed because the word TURBO is not within quotation marks.

HELP

The HELP command is used to find an error in a program that has just been executed. This command makes it much easier to find the exact place of a mistake in a program, which is especially a great help if you are writing a long program where a lot of errors can occur. After typing in HELP <RETURN> the line where the error has occurred will be displayed on your screen. You will see that one position of the line will be highlighted, this means that the position from the highlighted character shows the place of the error. The HELP command must always be used immediately after an error occurs, if you want to see the error again after you have used HELP you must re-run the program. To make things even easier the F6 function key is pre-programmed with the HELP command.

TRY THE FOLLOWING EXAMPLE :

```
TYPE IN : 10 FOR X=1 TO 10 <RETURN>
          20 PRIN X <RETURN>
          30 NEXT X <RETURN>
```

TYPE IN : RUN <RETURN>

RESULT : SYNTAX ERROR IN 20

TYPE IN : HELP <RETURN>

RESULT : The following line will be displayed 20 PRIN X (the X is highlighted)

TYPE IN : 20 PRINT X <RETURN>

TYPE IN : RUN <RETURN>

RESULT : *The different values of X will be displayed on the screen.*

OLD

The OLD command will retrieve a program that normally you would lose if the computer memory was cleared. If you make a mistake by clearing the computers memory (with the command NEW or the RESET button) you do not have to worry that all your work has been for nothing. All you have to do is type in OLD <RETURN> and you will get back your program that you would have normally lost.

TRY THE FOLLOWING EXAMPLE :

ACTION : Load a Basic program from disk or cassette

ACTION : Press the RESET button on the ROBCOM cartridge (you have now lost your Basic program)

TYPE IN : OLD <RETURN>

RESULT : Program that was in memory before you cleared the computer has now been recalled

TYPE IN : LIST <RETURN> - to list your program on
your screen OR
RUN <RETURN> - to execute the program
again.

PLIST

This command displays an entire Basic program page by page or a certain range of lines on your screen. This means that the list of your program will always start with a new screen after you have typed in the PLIST command. It will stop after the screen is filled with information instead of carrying on to the end of the program. To look at the following page all you have to do is press <RETURN> (any other key will return you to the edit mode). To make things even easier the F4 function key is pre-programmed with the PLIST command.

TRY THE FOLLOWING 2 EXAMPLES :

TYPE IN : PLIST <RETURN>

RESULT : The entire program will be displayed on your screen page by page (press <RETURN> to list the following page).

TYPE IN : PLIST 40-100 <RETURN>

RESULT : The program lines from 40 until 100 will be displayed on your screen.

RENUM

This command is used to automatically renumber lines in your program. The great advantage of this command is that if you need space in your program to insert lines it is now

possible to do this without having to change any line numbers yourself.

TRY THE FOLLOWING EXAMPLE :

```
TYPE IN : 1 FOR X=1 TO 10 <RETURN>
          2 PRINT X <RETURN>
          3 NEXT X <RETURN>
```

```
TYPE IN : RENUM 10,10 <RETURN>
```

```
TYPE IN : LIST <RETURN>
```

```
DISPLAY : 10 FOR X=1 TO 10
          20 PRINT X
          30 NEXT X
```

RESULT : The line numbers of your program have now been changed to start at line number 10 with an increase of 10 for each line that follows.

If you type in the command **RENUM <RETURN>** your program will be renumbered automatically starting at line 100 with an increase in steps of 10 for each line that follows.

SET

This command allows you to change the colour of the screen background and the border. All you have to do is type in the command **SET** followed by 2 numbers to change the colours. The first number is for the colour of the screen background and the second number is for the border. Colours can be selected by choosing a number from the table shown below :

Colours available :	0 = BLACK	1 = WHITE	2 = RED
	3 = CYAN	4 = PURPLE	5 = GREEN
	6 = BLUE	7 = YELLOW	8 = ORANGE
	9 = BROWN	10 = LIGHT RED	11 = GRAY 1
	12 = GRAY 2	13 = LIGHT GREEN	14 = LIGHT BLUE
	15 = GRAY 3		

TRY THE FOLLOWING EXAMPLE :

```
TYPE IN : SET 7,2 <RETURN>
```

RESULT : Screen colour will change to YELLOW, and the border colour to RED.

SHOW

This command will display a list on your screen of all the additional commands that are available for your ROBCOM cartridge.

```
TYPE IN : SHOW <RETURN>
```

RESULT : A list of additional commands are displayed on your screen.

SECTION 2 : ADVANCED BASIC TOOLKIT

This section is for the more experienced computer user who is already fluent in writing Basic programs.

DEC

FORMAT : DEC number <RETURN>

This command will convert a hexadecimal number into its decimal equivalent. This command will assist you when handling numeric data.

TYPE IN : DEC0801 <RETURN>

RESULT : The decimal equivalent is displayed on your screen : 2049

DUMP (not available in ROBCOM cartridge nr.50)

FORMAT : DUMP <RETURN>

This command lists all values of all variables. The values shown are those contained in the variables when the program was stopped either by pressing the RUN/STOP key or by reaching a program terminator. The variables are listed in the order in which they were defined in the program and are displayed in the format :

Variable Name = value (a variable is a symbol that stands for a value).

EXAMPLE: To display the variables from the following program.

```
TYPE IN      10 Y$="RANDOM COLOURS"  
              20 PRINT"CHR$(147)",Y$  
              30 X=INT(RND(8)*15)  
              40 POKE53281,X  
              50 FOR A=1TO50:NEXTA  
              60 GOTO 30
```

TYPE IN : RUN <RETURN>

ACTION : After the screen has changed colour a few times, press the RUN/STOP key in to interrupt the program.

TYPE IN : DUMP <RETURN>

```
DISPLAY : Y$ = RANDOM COLOURS  
          X  5  
          A 40
```

Note that because the values of X and A are generated randomly, the numbers displayed for those two variables will depend on when the program is stopped.

HEX

FORMAT : HEX number <RETURN>

This command is used to convert decimal numbers into its hexadecimal equivalent (maximum 63999). This command will assist you when handling numeric data.

TYPE IN : HEX 2049 <RETURN>

RESULT : The hexadecimal equivalent will be displayed on your screen : 0801

KEY

FORMAT : KEY number <RETURN>

This command is used to enable or disable the function keys. This is very useful if you have to use the function keys for another purpose.

TYPE IN : KEY0 <RETURN>

RESULT : This will disable all the function keys

TYPE IN : KEY1 <RETURN>

RESULT : This will enable all the function keys (this is necessary if you have stopped a program with the RUN/STOP and RESTORE keys).

QUIT

FORMAT : QUIT <RETURN>

This command disables the ROBCOM cartridge, the memory space from HEX C000 to CFFF will now be free (this is sometimes necessary if you want to run special machine-code programs). You can enable the cartridge again by typing in a SYS <number> :

TURBO 10 & 40 = SYS49152

TURBO 30 & 50 = SYS49179

TYPE IN : QUIT <RETURN>

RESULT : All commands and features of the cartridge are now disabled

TYPE IN : SYS49152 or SYS49179 <RETURN>

RESULT : All commands and features of the cartridge are now available again.

REP

FORMAT : REP <RETURN>

This command enables autorepeat for all keys, the second time will disable this function.

TYPE IN : REP <RETURN>

RESULT : Autorepeat for all keys are on
TYPE IN : REP <RETURN>
RESULT : Autorepeat for all keys are turned off.

RESET

FORMAT : RESET <RETURN>

RESET will clear any program held in memory of the COMMODORE 64 and display the screen that appeared when you switched on the computer (ie. the normal Commodore 64 screen). To enable the cartridge type in the SYS number (see command QUIT) or use the RESET BUTTON.

EXAMPLE: To reset the Commodore 64 to its initial screen.

TYPE IN : RESET <RETURN>

RESULT : The normal Commodore 64 startup screen is displayed.

If you make a mistake with this command do not worry that all your work was for nothing. It is still possible to recall your program use the RESET button or type in the SYS command, and then use command OLD.

TRACE

FORMAT : TRACE number <RETURN>

The TRACE command is used to display the number of the program line being executed, it has to be entered before a program is run. If a value of 10 is used as the command parameter, the trace will start at line number 10. If no line number is specified the execution will start at the beginning of the program. The line that is being executed is displayed at the top of the screen. The commands that are highlighted have already been executed. A step is executed by pressing the SHIFT key, if you press the SHIFT-LOCK key you can follow automatically the progress of the program execution, line by line.

EXAMPLE: To display the program line numbers one at a time when the following program is RUN.

```
TYPE IN : 10 FOR X=1TO10
          20 FOR Y=2TO8
          30 PRINTX,Y
          40 NEXTY
          50 NEXTX
          60 PRINT"THIS IS THE END"
```

COMMAND: TRACE <RETURN>

ACTION : Hold down the SHIFT or SHIFT-LOCK key.
RESULT : Each line of the program, as it is executed is shown at the top of the screen.
If you type in the command Trace with a line number then the trace will begin from that line number in your program.

PRE-PROGRAMMED FUNCTION KEYS

All the function keys are pre-programmed with useful features to help you use your computer much easier. You no longer have to type the whole command in anymore, all you have to do is press a function key.

F1 = COPY" ",2,2	Copy turbo-tape to turbo-tape.
F2 = COPY" ",2,8	Copy turbo-tape to disk.
F3 = DLOAD	Load a program from disk more than 5 times faster.
F4 = PLIST	List a program page by page.
F5 = GET	Loads a program from tape more than 10 times faster.
F6 = HELP	Finds the error in your Basic program.
F7 = QUIT:RUN	Quits the turbotool and runs a program.
F8 = RUN	Runs a program loaded by turbotool.

CASSETTE COMMANDS

It is now possible to load and save your programs more than 10 times faster with this unique ROBCOM cartridge.

VERY IMPORTANT : It is not possible to turbo load protected programs (ie. original) using this cartridge. The reason is that the program has to be saved faster first, before you can turbo load any program. However all your own or unprotected programs can be turbo loaded, all you have to do is save them faster first.

To turbo load a program carry out the following instructions.

PUT and PUT*

This command is used to save programs on tape in a special format, which is more than 10 times faster than using the normal command 'SAVE'.

TRY THIS EXAMPLE :

ACTION : Save a program that you have written or

already have on cassette using the PUT command.

TYPE IN : PUT"PROGRAM NAME"

DISPLAY PRESS PLAY AND RECORD ON TAPE

DISPLAY : SAVING
READY

RESULT : The program has now been saved 10 times faster.

Try this example again using the same program but instead of using the PUT command try it this time with the normal 'SAVE' command. You will see that if you check the counter on your cassette recorder not only does it take much longer, but it also needs much more tape to save the same program.

You can also use the PUT* command to save time, this command will only write a small header label on the cassette. This means that before you save a program with PUT* wind the tape past the tape leader strip. The PUT command cannot be used to save programs that are protected (ie. original).

GET

This command loads a program from tape more than 10 times faster than normal. It only applies to programs that have been saved with the command PUT or PUT* as shown above. The GET command is used in the same way as the Basic command 'LOAD'.

TRY THIS EXAMPLE :

ACTION : Use a program that has already been saved with the PUT command.

TYPE IN : GET"PROGRAM NAME" <RETURN>

DISPLAY : PRESS PLAY ON TAPE

DISPLAY : LOADING
READY

RESULT : The program has now been loaded 10 times faster.

To make it even easier just press function key F5 to execute the GET command.

Very important, the GET command will not load any protected programs (ie. original), faster than normal.

MERGE

This command loads a program from tape that has been saved with the PUT command and merges it with a program that is already in the computers memory. The line

numbers of the second program have to be higher than the line numbers of the first program. If this is not the case then use the command RENUM to change the line numbers.

TRY THIS EXAMPLE :

ACTION : Write a small program and save it on cassette with the PUT command using the name "TURBO".

TYPE IN : NEW <RETURN>

ACTION : Write another small program

TYPE IN : MERGE "TURBO" <RETURN>

DISPLAY : Press play on tape

DISPLAY : LOADING TURBO
READY

RESULT : The two programs have now been merged into one program.

COMP

The COMP command is used to check the contents of a program that has just been saved on cassette to make sure that the program has been stored properly.

TRY THIS EXAMPLE :

ACTION : Save a program on the cassette recorder

TYPE IN : COMP "PROGRAM NAME"

RESULT : The contents of the program saved are checked to see if it has been stored properly.

DISK COMMANDS

It is now possible to load your program more than 5 times faster from disk using the ROBCOM disk turbo cartridge (this feature is not available in ROBCOM cartridges TURBO 10, 20 and 40)

VERY IMPORTANT : It is not possible to load programs faster that already have their own turbo loader. Also programs that use the same area as the ROBCOM disk turbo cannot be loaded faster.

DLOAD

The DLOAD command is used to load a program from disk. If you have bought one of the ROBCOM disk turbo cartridges then you will be able to use this command to load your program automatically more than 5 times faster than normal. If you have bought a ROBCOM cartridge without a disk turbo the program will be loaded at normal speed.

Loading instructions : In place of typing LOAD"PROGRAM NAME",8 you can simply use DLOAD"PROGRAM NAME" and the program will be loaded.

TRY THIS EXAMPLE :

TYPE IN : DLOAD"PROGRAM NAME"

RESULT : The program in your DLOAD instruction will be loaded.

To make it even easier function key F3 has now been pre-programmed as DLOAD. Another great advantage is that it is now possible to load a program directly from your disk directory.

TYPE IN : ↑ <RETURN>

DISPLAY : The directory from your disk will be shown.

ACTION : Move your cursor to the first position from the line of the program that you want to load. All you have to do is press the F3 function key and the word DLOAD will appear before the program that you want to load, the program will now be automatically loaded from disk.

DMERGE

This command loads a program from disk (more than 5 times faster if a DISK TURBO is included in the cartridge) and merges it with the program that is already in the computers memory. The line numbers from the second program have to be higher than the line numbers of the first program. If this is not the case then use the command RENUM to change the line numbers (see MERGE command for an example).

DSAVE

The DSAVE command is used to save the program that is in the computers memory onto your disk. In place of typing in SAVE"PROGRAM NAME",8 you can type in DSAVE"PROGRAM NAME" <RETURN>.

TYPE IN : DSAVE"PROGRAM NAME" <RETURN>

RESULT : Program is now saved on disk.

DVERIFY

This command is used to compare the contents of a program on disk, with a program currently in the computers memory.

TYPE IN : DVERIFY"TEST" <RETURN>

RESULT : The contents of the program in the computers memory and the contents of the program just saved are checked to see if they are the same.

↑ (arrow up)

This command displays the directory (table of contents) from a disk on your screen without using any memory or disturbing the program already in memory.

TYPE IN : ↑ <RETURN>

RESULT : The directory will be displayed on your screen.

. (full stop)

If this command is only followed by <RETURN> it will read the error channel from your disk drive. This means that if the red light is flashing on your disk drive you only have to type this command in to find out exactly what the problem is. The other great advantages when using this command is that it will not only save you time, but also make the standard CBM disk commands much simpler to work with. All you have to do is to type in . (full stop) followed by a disk command as shown in the table below.

.N:diskname,id	- formats a floppy disk.
.S:name	- scratches a file with the name that is specified.
.R:new=old	- renames an old file with a new name.
.V	- validates a floppy disk.
.U:	- resets your disk drive.

/ (slash)

This command will load a program from disk (more than five times faster with the disk turbo versions) without relocating it (load"prg.name",8,1). The great advantage of this command is that all you do is type in a / in front of the program you want to load. It is also possible to load a program directly from your directory, by moving the cursor to the place of the program that you want to load and then typing /

TYPE IN : /PROGRAM NAME <RETURN>

RESULT : The program will be loaded or turbo loaded from your disk.

VERY IMPORTANT : See DEV command for the loading of programs that consist of more than one part.

FLOPPY

This command is used to change the number from your disk drive from unit 8 to unit 9. This is very useful when you want to use 2 disk drives (eg. for fast file copy). To return

back to normal disk operation (unit 8) just turn your disk drive off and then on again.

TYPE IN : FLOPPY

RESULT : Disk drive is now recognised as unit 9.

COPY COMMANDS

The COPY commands allow you to make backups from your programs on both cassette and disk.

COPY

The COPY command allows you to make backups of programs up to 46k (186 blocks) in size. This includes autostart and machine-code programs (loading from disk will be 5 times faster if you use ROBCOM cartridge NO.30 or NO.50). All you have to do is type in the COPY command followed by two numbers. The input unit is the first number and the output unit is the second number.

The unit numbers are as follows :

Tape normal speed : unit number 1

Tape turbo speed : unit number 2

Disk drive : unit number 8 or 9

There are four different possibilities to copy programs :

CASSETTE TO CASSETTE
CASSETTE TO DISK
DISK TO CASSETTE
DISK TO DISK*

*Using the DISK to DISK feature, it is possible to copy sequential, program and user files, using 1 or 2 disk drives.

TRY THIS EXAMPLE :

TYPE IN : COPY"PROGRAM NAME",8,2 <RETURN>

This means that unit 8 (first number) is where the original program is, and that unit 2 (second number) is where you want the copy to come.

DISPLAY : After the program is loaded from disk, the following message will appear on your screen: 'ENTER DESTINATION CASSETTE'.

ACTION : Place the tape in cassette recorder and press the SPACE BAR.

RESULT : The program will be saved on tape in turbo tape format.

VERY IMPORTANT

It is also possible to have the same unit numbers for the original and the copy, ie. cassette to cassette & disk to disk.

If you want to copy a program to cassette saving it with turbo tape format, do not forget to wind the tape leader strip past the begin strip.

If you copy from cassette and you do not give a program name, the next program on cassette will be automatically copied.

It is also possible to change the name of a copy by typing in N after the text "ENTER DESTINATION CASSETTE" has been displayed. All you have to do is enter the new name and then press <return>.

You can also copy sequential and user files from disk to disk. Type 'S' or 'U' behind the name of the file you want to copy. Disk drive owners can make backups of all files (PGM,USR,SEQ) on tape.

If you use the turbotape format it is possible to store on a 60 minute tape more than 6 times as much information as on a full disk with 664 blocks.

DEV

This command gives you the possibility to save a program to tape that is in two parts on disk. All you have to do is type in DEV number (see COPY command for device numbers), then all the LOAD commands are automatically sent to the device number that is specified in the DEV command.

TYPE IN : DEV2 <RETURN>

RESULT : All loads are sent to device 2, which is TURBO TAPE. For example LOAD"NAME",8,1 will not be sent to DISK but TURBO TAPE. If you type in DEV <RETURN> this will return the device back to normal operation.

If you have a disk program that is in two parts, it is also possible using this command to load programs that are in more than one part five times faster (only with ROBCOM cartridges TURBO 30 & 50). This only applies to programs where the other parts are normally automatically loaded.

TYPE IN : DEV8 <RETURN>

ACTION : Load program from disk

RESULT : Program will be loaded from disk 5 times faster.

RECOP

This command makes it possible to make a second copy of

the program you have just copied. This is very useful if the disk becomes full or you want to make more than one copy from the same program. This will save you a lot of time, because you will not have to do the whole operation again.

PRINTER COMMANDS (not available in ROBCOM cartridges TURBO 20 and 30)

The ROBCOM CARTRIDGE has its own Centronics software program. This means it is now possible to use a non Commodore printer that is connected via the user port of your computer. All you need is a standard Centronics cable to be able to use these printers.

CENT

This command is used for working with a non Commodore printer. Before you use these commands it is advisable to read your printer manual thoroughly.

The following commands are available :

- A. CENT0,0 Centronics-port and listing mode is off.
- B. CENT1,0 Centronics-port on, listing mode off (transparent mode on).
- C. CENT1,1 Centronics-port on, listing mode on.
- D. CENT0,1 Centronics-port off, listing mode on.

TYPE IN : CENT1,1:OPEN4,4:CMD4:LIST

RESULT : This will print a listing on your printer giving a readable translation of all special characters (eg. colours, function keys etc.)

VERY IMPORTANT : For people who use a normal Commodore printer instead of a centronics type printer it is also possible to use the 'listing mode'. All you have to do is use the command CENT0,1.

COLUMN

You can now select the number of characters that you want to print from a program listing on one line. If you enter COLUMN <return> the standard 80 characters will be restored.

TYPE IN : COLUMN 40 <RETURN>

RESULT : A maximum of 40 characters will be printed on one line.

ROBCOM CASSETTE ALIGNMENT SYSTEM

The ROBCOM CARTRIDGE has a special program that makes it possible to adjust the tape head alignment of your CBM 64 recorder. Badly aligned tape heads are the most frequent cause of tape loading errors on pre-recorded cassettes. The problem has become more acute with the introduction of fast loading systems, longer programs and mass produced recordings. In most cases where commercial tapes have been returned because they failed to load, it is the alignment of the users recorder which is at fault. Now using this very simple alignment system from ROBCOM you can solve these 'LOAD ERRORS'.

VERY IMPORTANT : It is advisable to clean the tape heads and pinch roller before you start the alignment procedure.

HOW TO ALIGN THE TAPE HEAD

1. Insert the ROBCOM CARTRIDGE and switch the computer on.
2. Place the ROBCOM REFERENCE TAPE in the recorder and press 'play'.
3. Type GET (to start the program) and press <RETURN>.
4. Observe now the pattern on the screen:
 - A. If the tape head is properly aligned, you will see very small wavy horizontal stripes (the stripes will be moving slightly).
 - B. If the head alignment is not correct you will see wide coloured stripes or your screen will change colour.Insert the screwdriver into the small hole on the top of your recorder. Now turn the screw very slowly, you can turn the adjustment screw clockwise or anti-clockwise. You will have to decide which direction yourself, but never turn the screw more than 1.5 turns. The pattern on the screen will now change until you get the horizontal stripes as described in A. Turn the screw until you find the correct pattern as described in A.
5. When you get the right pattern on your screen, take out the screwdriver and press stop on your cassette recorder.

VERY IMPORTANT : Not only a badly aligned recorder is the cause of 'load errors', but also dirt, dust, strong magnetic fields, high temperatures etc.

NOTE : On some Commodore compatible recorders the screw is only accessible with the cassette compartment removed. On these, press the lid sides to release the catches and lift out. Perform the operation without the cover and replace it afterwards.

ROBCOM MACHINE-CODE MONITOR

INTRODUCTION

The ROBCOM monitor is a machine language monitor for the Commodore 64. It contains many features that will enable you to create, modify and test machine language programs and subroutines. It only uses 4 kbyte of memory, there are no addresses or zero page addresses needed outside these 4 kbytes. It is now very easy to test programs with this monitor without disturbing program execution.

NEW COMMANDS

(added to the toolkit commands)

MON (hexaddress)

This is the command that is used to start the monitor. (eg. MON8000 places the monitor in memory \$8000 to \$9000). Once the monitor has been started up, all you have to do the next time is type in MON <RETURN> and this will save you time. The MONITOR will respond by displaying the CPU registers, typing a period and flashing the cursor. The period is a prompt that lets you know the MONITOR is waiting for your command. The commands are described on the following pages.

MEMTOP (hexaddress) (NOT AVAILABLE IN ROBCOM 20)

The MEMTOP command sets the top of memory for Basic-Programs. If you have placed the monitor for example in the memory from \$9000 to \$9FFF (by entering MON \$9000), you can protect the Monitor from destruction by a Basic-Program by setting the top of the memory to \$9000. Now the computer "thinks" that the memory for Basic ends at the address \$9000 and it will not try to store values above that address. You can now run Basic programs and later use the Monitor again.

MONITOR COMMANDS

A - ASSEMBLE

A 0350 LDA F5

You type in the mnemonic code and the monitor will translate it right away to machine-code. If there is text that no longer is needed on the same line, you can delete this by typing in ':', the rest of the text will then be ignored. A

<RETURN> is used to indicate the end of the assembly line. If there are any errors in the line, a question mark is displayed to indicate an error, and a period is typed on the next line. After a line of code is successfully assembled, the assembler will print a prompt containing the next legal memory location for an instruction. To exit the assembler, type <RETURN> after the address prompt.

B – BREAKPOINT SET

B 0350

The command BRK (that is 00) is placed in the given address (the original code is saved), the example gives a Break at \$0350. By typing in a B without an address the breakpoint will be erased. If you give a breakpoint for a new address, then the old address will be erased.

C – COMPARE MEMORY

C AAAA BBBB CCCC

This command compares two sections of memory and reports any differences by printing the address of one member of the mismatched pair(s). You can compare the memory range from \$AAAA – \$BBBB with the memory that begins at \$CCCC.

D – DISASSEMBLE

D AAAA

This command is the reverse of the assemble command, it interprets memory contents as machine-code instructions and displays the assembly language equivalent. Disassemble can be used in two ways, the first is used to disassemble a section of memory by specifying an address range. The disassemble command can be started by entering a single parameter, the begin address (the disassembler begins at address \$AAAA). With <RETURN> it is possible after every full screen to load the following page. With only a D <RETURN> it is possible to load the last defined address again. If you type after A “:”, it is then possible to change the hexbytes directly.

E – EDITOR IN SCREEN CODE

E AAAA BBBB

Shows the memory range from \$AAAA to \$BBBB (exactly as it is in memory). Not in hexbytes, but just the same as if you poked into screen memory. The characters can be edited or altered by typing over the old ones, and pressing <RETURN>.

F – FILL MEMORY

F AAAA BBBB CC

This command is used to set a section of memory to a particular value. It fills memory from \$AAAA – \$BBBB with the hexadecimal number \$CC. This command is useful for initializing data structures or any other RAM area.

G – GO

G AAAA

This command executes a machine-code program starting at hexaddress AAAA. If no address parameter is given, execution begins at the address that is in the program counter of the register display command. If there is a BRK in the program you will return to the monitor.

H – HUNT MEMORY

H AAAA BBBB CC DD

This command locates a specific range of bytes in memory. Looks in memory within the range \$AAAA – \$BBBB for the bytes \$CC, \$DD and prints the address where it is found. H AAAA BBBB 'TEXT' looks for the ascii string 'text'.

I – INTERROGATE MEMORY

I AAAA BBBB

Displays the contents of memory between AAAA – BBBB in hexbytes and ascii. Use <RETURN> for a new page, and I <RETURN> to begin again. The Bytes following the : can be changed by typing over them and then typing a <RETURN>.

J – JUMP ROUTINE

J AAAA

This command will run a machine-code subroutine starting at the hexaddress AAAA. If no address parameter is given, execution begins at the address that is in the program counter as displayed with the 'R' command. With RTS (\$60) you can return to the monitor.

L – LOAD A PROGRAM

L "name", Ox

This command loads a program into memory from an external device such as disk or tape.

x = 1 – cassette recorder normal.

x = 2 – cassette recorder turbo.

x = 8 – floppy disk.

If you want to load a program faster from the 1541 disk drive (available only in ROBCOM cartridges NO.3 and NO.5), first you type in Basic 'Dev8', then start the monitor, the program will be automatically loaded faster from the monitor (the only time that this does not work is when you load a program that needs to use the same area as the disk turbo).

You can also load a program in a memory place of your choice. In that case you have to specify the address where the start program has to be loaded, eg. L"TEST", 08,5000 will load the program named TEST in the memory starting at hexaddress \$5000, independently from the original address of the program.

M – MEMORY DUMP

M AAAA BBBB

Displays the contents of memory between AAAA – BBBB in hexbytes and ASCII, use <RETURN> for a new page.

N – NEW LOCATOR

N AAAA BBBB CCCC DDDD EEEE

NEW LOCATOR is designed to convert all absolute address references in a machine-code program. By adding the specified offset \$CCCC to this address reference, it will prepare the program for execution at another place in memory.

\$AAAA	– start address from the code.
\$BBBB	– end address from the code.
\$CCCC	– offset for the changing.
\$DDDD	– start range.
\$EEEE	– end range.

Only the addresses change that are in the range of \$DDDD – \$EEEE, the other ones usually ROM routines will stay the same.

O – ORIGIN

O AAAA

This very powerful command will move the monitor to the specified address \$AAAA. The monitor uses only 4 kbyte, the place is now AAAA to AAAA + \$0FFF). As soon as you give the command O, then the monitor is placed in memory and started. (If you use the Monitor in conjunction with the ROBCOM-Toolkit you must QUIT the Toolkit if you want to place the Monitor in the range from \$C000 to \$CFFF. Re-enter the Monitor with a SYS and then give O C000).

P – PRINTER OUTPUT

P+

This command switches the output of the Monitor to the printer (same as the Basic command – OPEN4, 4:CMD4). With P <RETURN> it will restore the output to the screen.

Q – QUICKTRACE

Q AAAA BBBB

This command is used for debugging machine-code programs. It tests a program starting from the address that is in the Program Counter (see command R). The program stops outside the range of \$AAAA – \$BBBB and comes in the WALK MODE. You can stop at any time by pressing the RUN/STOP key. Q <RETURN> gives a quick trace without using the WALK MODE.

R – REGISTER DISPLAY

R <RETURN>

PC	AC	XR	YR	SP	NV*BDIZC
.; AAAA	BB	CC	DD	EE	11010011

Displays the contents of the registers before a program is run with G, J, Q, or W. When the processor returns to the monitor (eg. BRK) then its registers are shown exactly as they are at that moment. You can modify the information by just typing over what is shown. The flags can be simply set or reset by typing 0 or 1 at the respective place.

S – SAVE A PROGRAM

S“name”,OX,AAAA,BBBB

This command saves the contents of a specified range of memory to an external device. It writes the memory area from \$AAAA to \$BBBB to device OX (see command L for device information).

T – TRANSFER MEMORY

T AAAA BBBB CCCC

This command transfers the contents of a block of memory to another area. It will copy the information in the memory area \$AAAA – \$BBBB to the area that begins at \$CCCC.

V – VIDEO SCREEN INPUT

V AAAA TEXT. . .

Places from address \$AAAA the text and/or alphanumeric characters in memory in the same form as command E displays it.

W – WALK MODE

W AAAA BBBB

Executes a program step by step, starting at the address that is in the Program Counter (see command R). The content of all the registers will be shown together with a disassembly of the instruction. Different speeds can be set with various keys (CONTROL, C=, & SPACE). Subroutines or parts of the program that are outside of the specified address range from \$AAAA to \$BBBB are executed in QUICKTRACE MODE. Q <RETURN> gives a WALK without using the Quicktrace Mode. By pressing the RUN/STOP key you can leave the Walk Mode.

X – EXIT MONITOR

X

This command gives control back to Basic. If you use the Monitor in conjunction with the ROBCOM Turbo-Toolkit you can return to the Monitor using MON <RETURN>. Otherwise you will have to use a SYS command (for the startaddress) to start the Monitor up again.

Z – ZIP THROUGH WORD-TABLES

Z AAAA BBBB CCCC DDDD EEEE

This command changes tables of address words. The definition from the input parameters are the same as under command N (between \$AAAA – \$BBBB there is a table of address words).

+ ADDITION

+ AAAA BBBB

The two hex numbers (input) are added and the sum is displayed.

- SUBTRACTION

- AAAA BBBB

The second number is subtracted from the first and the difference is displayed.

\$ HEXADECIMAL CONVERSION

\$00F0 #240 %11110000

Converts a hexadecimal number (input) to binary and decimal numbers.

% BINARY CONVERSION

%1001 #9 \$0009

Converts a binary number (input) to hexadecimal and decimal numbers.

DECIMAL CONVERSION

#10 \$0A %0001010

Converts a decimal number (input) to binary and hexadecimal numbers.

↑ DIRECTORY

↑

Loads the directory (table of contents) from disk and displays it on the screen (does not affect memory).

? ERROR REQUEST

? <RETURN>

Displays the contents from the error channel of your 1541 disk drive.

> DISK COMMAND

>'disk command'

Sends command to the disk drive, eg. >I or >V (see COMMODORE 1541 MANUAL).

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