DISK ANTI-PIRATE

DISK ANTI-PIRATE IS A Utility Program ℮ TRS-80 EXTENDED BASIC COLOR COMPUTER. It is mainly a ML program that combines many features no other single program offers. If you write Basic or ML programs, DISK ANTI-PIRATE will help you protect your programs in the best possible way and add professionalism to your software.

IMPORTANT FEATURES:

- Creates a ML Autostart loader for your Basic and ML programs.
- Effectively encrypts your programs to prevent listing or disassembly.
- Even protects ML SUBROUTINES called from Basic programs.
- Disables the RESET BUTTON (restarts your program when Reset-Button is pressed), BREAK KEY and CLEAR KEY.
- Masks the code so that LIST, LLIST, CLOAD(M) CSAVE(M), MERGE will work ONLY with YOUR Passwords.
- Creates an 'ONERR GOTO' routine to trap errors (even for ML programs!).
- Includes a TITLE SCREEN EDITOR to create title screens, which can be displayed while your program is loading. The editor allows a choice of 9 Background and Border colors, allows you to mix text and graphics and provides 4-way cursor control. The Title Screens can be saved to or loaded back from disk.
- Menu Oriented.
- NO ROYALTIES/AGREEMENTS/CONTRACTS.
- Compatible WITH DISK BASIC 1.0/1.1 AND CoCoI and CoCoII.
- Works with 16K/32K/64K Disk Systems.
- Full Easy-to-Follow documentation.

Min 16K ECB Disk System.

MICROCOM SOFTWARE

P.O. BOX 214, FAIRPORT, N.Y. 14450
(716)223-1477
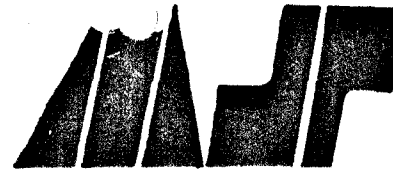
MICROCOM SOFTWARE

PRESENTS

DISK ANTI-PIRATE

By
Kishore M. Santwani

DISK ANTI-PIRATE

by

KISHORE M. SANTWANI

SOFTWARE AUTHORS

In case you use DISK ANTI-PIRATE for your BASIC or ML PROGRAMS, MICROCOM SOFTWARE will allow you to do so without requesting any royalties.

However, we ask you to send us a copy of your product that uses DISK ANTI-PIRATE and include the following credit in your documentation:

YOUR PRODUCT uses DISK ANTI-PIRATE, available from MICROCOM SOFTWARE, PO BOX 214, FAIRPORT, NY 14450.

LOADING AND MODIFYING YOUR PROGRAM

DISK ANTI-PIRATE can be used for 3 types of programs, namely, (1) Basic programs, (2) ML programs and (3) ML SUBROUTINES CALLED FROM BASIC. If you have a Basic program which calls ML subroutine(s) within it, AND you want to protect BOTH the Basic Program and the ML Subroutine(s), first follow thru the complete procedure for BASIC PROGRAMS ONLY. Then follow the procedure for ML SUBROUTINES CALLED FROM BASIC from the beginning.

For Basic Programs Only

LOAD YOUR Basic program from disk and follow the procedure given below:

(a) Make a note of the PCLEAR statement, if any, in your Basic Program.

(b) If you decide to disable the BREAK KEY during your program, change CLOADM or CSAVEM commands, if any, in your program as follows:

Substitute 'EXEC &H8324' for the CSAVEM command and 'EXEC &H8C6E' for the CLOADM command.

For Example

10 CSAVEM "TITLE", 1024, 1535, 1024
20 CLOADM "TITLE"

should be changed as:

10 EXEC &H8324 "TITLE", 1024, 1535, 1024
20 EXEC &H8C6E "TITLE"

(c) In case you have a RUN command WITHIN your Basic Program, make sure to qualify it

with a statement number, say 'RUN 10'.

(d) DISK ANTI-PIRATE includes an ONERR GOTO feature which allows you to trap errors. In case you wish to use the ONERR GOTO routine, follow the procedure given below, otherwise skip to step (e):

Add the following statements AFTER THE LAST STATEMENT OF YOUR PROGRAM. The statement numbers given here can be changed suitably.

```
9000      POKE    111,0:LN=PEEK(&HFE)    *256+
PEEK(&HFF):  E=PEEK(&HFD):  IF  E  >=54  THEN
AE=(PEEK(402)*256+PEEK(403))-11+E    ELSE    IF
E>=50 THEN AE= &H88D9 + E ELSE AE=&HABAF+E
9010 E$=CHR$(PEEK(AE))+CHR$(PEEK(AE+1))
```

The E$ contains the Error Type and the variable LN contains the statement number where the error occurred. The basic concept of this routine is to have Basic jump to a particular statement number (9000 in this case) in case of an error and allow you to rectify the error without erasing any variables or strings of your program. You MAY include additional statements to print specific messages for different errors. For example:

```
9020  IF E$="OV" THEN PRINT"NUMBER TOO LARGE"
ELSE IF E$="IO" THEN PRINT"BAD   TAPE/DISK  ..
CANNOT READ"
9030 GOTO 10
```

Note how statement 9020 has been setup to print specific messages in case of OV or IO errors. Make sure to include a 'GOTO xx' statement as the final statement in your program, where xx is ANY statement number in your program, the Basic should jump to after it has executed the ONERR GOTO

STATEMENTS (9000-9030 in this case).

Make a note of the STARTING STATEMENT NUMBER of the ONERR GOTO STATEMENTS (9000 in the example above. This number will be later referred to as the ONERR GOTO LINE NUMBER.

(e) If you are calling a ML subroutine from your Basic program by LOADM"filename" and you wish to protect the ML subroutine, modify your program as follows:

For example

10 LOADM"MLSUB":PRINT"START OF PROGRAM"

should be changed to:

10   LOADM"MLSUB/DSK":EXEC   465:1234567890: PRINT "START OF PROGRAM"

The 10-digit number after 'EXEC 465:' is the password for your ML subroutine. You may choose ANY 10-DIGIT NUMBER as a password for your ML subroutine. Make a note of this number. This number will be referred to as NUMBER A.

(f) Disabling the RESET BUTTON / BREAK KEY/ CLEAR KEY and changing the passwords of various   BASIC/ECB/   DISK   BASIC commands/functions may take UPTO 700 bytes from your Basic Program. Hence, keep your program as compact as possible. Note: Use the table at the end of this instruction manual to figure out exactly how much memory the DISK ANTI-PIRATE disable routines will take from your Basic Program.

(g) If you have a 'RUN "filename"' statement WITHIN your Basic Program, replace it with 'LOAD"filename",R'.

(h) Now SAVE this MODIFIED BASIC PROGRAM on

a disk and make a note of the filename under which this MODIFIED BASIC PROGRAM is saved. (This filename will be referred to as FILENAME A). Note: FILENAME A should NOT be the same as your original Basic Program Filename.

For ML Programs AND ML SUBROUTINES CALLED FROM BASIC

Use an EDITOR / ASSEMBLER to modify your ML program. Now LOADM your ML program from disk. IF YOU ARE USING DISK ANTI-PIRATE TO PROTECT ML SUBROUTINES CALLED FROM BASIC , FOLLOW STEPS (b) and (e) OR ELSE follow steps (a) thru (e).

(a) In case you decide to disable the RESET BUTTON, replace instructions such as 'CLR $71', 'STX $72', 'STU $72' , 'STY $72' and 'STD $72' with 'NOP's.

(b) DISK ANTI-PIRATE uses memory locations $1D1 to $2C0. If your ML program is located between these locations make sure to relocate your program at a different address.

(c) In case you decide to use the ONERR GOTO routine for trapping errors, follow the procedure given below, otherwise skip to step (d):

Add the following statements AFTER THE LAST STATEMENT in your program. The statement numbers given here can be changed suitably:

```
9000 ONERR  CLR    $6F
9010        CLRA
9030        LDB    $FD
9035        TFR    D,X
9037        CMPB   #54
9040        BLO    ONER1
9050        LDD    $192
9052        SUBD   #11
9055        LDU    D,X
9060        BRA    RET
9070 ONER1  CMPB   #50
9080        BLO    ONER2
9090        LDU    $88D9,X
9100        BRA    RET
9110 ONER2  LDU    $ABAF,X
9120 RET    NOP
```

Register U contains the Error Type. You may add as many statements after 9110 to handle errors. Make sure to have a BRA, LBRA or a JMP instruction at the end of your program.

Now assemble the program to disk and make a note of the address where 'ONERR' assembles. This address can be found besides the word ONERR in the SYMBOL TABLE. This address will be referred to as the ONERR GOTO LINE NUMBER.

(d) If you are using the DISK ANTI-PIRATE disable routines (such as the BREAK KEY DISABLE), DISK ANTI-PIRATE will take UPTO 700 bytes beginning at the TOP OF RAM for your system. Turn to the end of thismanual and ADD UP the memory requirements of the disables you want to use. Now subtract this number from the TOP OF RAM(16382 for 16K & 32766 for 32K/64K). This number indicates the address the DISK ANTI-PIRATE will use for the disable routines. Make sure that your ML program resides BELOW this address.

(e) Now assemble this MODIFIED ML PROGRAM to DISK and make a note of the Starting and

Ending Address of your program and the filename under which this MODIFIED ML PROGRAM is saved. This filename will be referred to as FILENAME A. Note: FILENAME A should be the same as your original ML program filename for 'ML SUBROUTINES CALLED FROM BASIC' and different for ML programs.

LOADING DISK ANTI-PIRATE

Insert the DISK ANTI-PIRATE disk in the disk drive and type: LOADM"PIRATE" <ENTER>. The program will display the title screen, load and start automatically.

The title screen is followed by a menu as follows:

CREATE TITLE SCREEN

PRODUCE PROGRAM DISK

EXIT TO BASIC

If you DO NOT want a title screen for your program(s), skip to the section labelled 'PRODUCE PROGRAM DISK'

CREATE TITLE SCREEN

Enter 'C' for this option. This option leads to the following menu:

INITIALIZE TITLE SCREEN

EDIT TITLE SCREEN

LOAD TITLE SCREEN

SAVE TITLE SCREEN

CLEAR FOR MENU

Initialize Title Screen

Enter 'I' for this option. ENTER THIS OPTION ONLY WHEN YOU ARE CREATING A NEW TITLE SCREEN or else the existing title screen, if any, will be erased from memory.

This option will help you choose the Border and the Background color for your title screen. Use the Up and Down arrows for glancing at the Border and the Background colors available to you. Press <ENTER> after selection of the suitable color. Use the commands listed in the 'COMMANDS TABLE' to create your title screen.

COMMANDS TABLE

KEY	FUNCTIONS
C0	Sets Black Cursor
C1	Sets Green Cursor
C2	Sets Yellow Cursor
C3	Sets Blue Cursor
C4	Sets Purple Cursor
C5	Sets White Cursor
C6	Sets Light Green Cursor
C7	Sets Dark Blue Cursor
C8	Sets Orange Cursor
S	Sets a pixel of Cursor Color
B	Sets Border Color (Use Up and Down Arrows to select Border Color)
X	Sets text mode
Up Arrow	Moves Cursor up
Down Arrow	Moves Cursor Down
Right Arrow	Moves Cursor Right
Left Arrow	Moves Cursor Left
T	Activates trail of Cursor Color
<SPACE BAR>	Stops Cursor Movement AND deactives trail
<CLEAR>	Returns to menu

. ONLY and GRAPHICS AND
TEXT modes

NOTE: In the GRAPHICS ONLY mode, all unwanted
text on the screen can be erased simply by
moving the cursor over the unwanted text.

Edit Title Screen

Enter 'E' for this option. Enter this
option to edit an existng title or to edit a
title screen loaded from disk. This option
DOES NOT erase any existing title sceren from
memory. Use the same commands as given in the
Commands Table under 'Initializing Title
Screen'.

Load Title Screen

Enter 'L' for this option. To load a
previously saved title screen from disk,
enter the appropriate filename and press
<ENTER>. Use the Right arrow for 'DIR', if
necessary. Use the <CLEAR KEY> to return to
previous menu.

Save Title Screen

Enter 'S' for this option to save an
existing title screen to disk. Enter the
appropriate filename and press <ENTER>. Make
a note of this filename. This filename will
be referred to as FILENAME B. Use the right
arrow for 'DIR', if necessary. Use the <CLEAR
KEY> to return to previous menu.

NOTE: To return to MAIN MENU, insert the DISK
ANTI-PIRATE DISK and press <CLEAR>.

PRODUCE PROGRAM DISK

Enter 'P' for this option. This option
leads you to the following menu:

DEFINE PARAMETERS

SAVE ANTI-PIRATE TO DISK

CLEAR FOR MENU

Define Parameters

Enter 'D' for this option. Use this option
to define various parameters before saving
DISK ANTI-PIRATE to disk. Enter the
appropriate information for the following
parameters:

TITLE SCREEN (Y/N)

Enter 'Y' to this option if you wish that
a title screen should precede your program.
Otherwise enter 'N'. NOTE: If you are using
DISK ANTI-PIRATE for protecting ML
SUBROUTINES CALLED FROM BASIC, then enter
'N' to this option.

FILENAME:

If you answered 'Y' to the above option,
enter FILENAME B and press <ENTER>.

IS YOUR PROGRAM Basic / ML:

Enter 'B' or 'M' for this options. Note:
For ML SUBROUTINES CALLED FROM BASIC, enter
'M'.

STARTING ADDRESS OF YOUR BASIC PROGRAM

If you answered 'B' to the above option, you
must enter the starting address of your
Basic program. Earlier, you made a note of
the PCLEAR STATEMENT, if any, within your
program. Use that PCLEAR VALUE to determine

you do not have a PCLEAR Statement in your Basic Program, use the address for PCLEAR 4.

PCLEAR VALUE	STARTING ADDRESS IN DECIMAL
0	3585
1	5120
2	6656
3	8192
4	9728
5	11264
6	12800
7	14336
8	15872

You may now input the appropriate starting address and press <ENTER>.

PROGRAM ENCRYPTION(Y/N)

Enter 'Y' if you wish to encrypt your program. Otherwise enter 'N'. Note: For ML SUBROUTINES CALLED FROM BASIC, enter 'Y'.

If YOUR Program is in BASIC, skip to the section 'OPTIONS SCREEN'.

If YOUR Program is in ML, the program will present the following options:

(1) FORMAT I

(2) FORMAT II

If your program is 100% ML, enter 1 and skip to the section 'OPTIONS SCREEN'. If your program is a ML SUBROUTINE which you call from your Basic program, enter 2 and follow the procedure given below:

(a) Enter NUMBER A, when the program asks

you for a ENCRYPTION CODE.

(b) When the program asks you for 'INITIAL FILENAME', enter FILENAME A and press <ENTER>.

(c) Skip to the section 'SAVE ANTI-PIRATE TO DISK'

OPTIONS SCREEN

The program will present you with the following menu:

```
RESET BUTTON DISABLE(Y/N)
BREAK KEY DISABLE(Y/N)
CLEAR KEY DISABLE(Y/N)
COLOR BASIC COMMANDS DISABLE(Y/N)
COLOR BASIC FUNCTION DISABLE(Y/N)
ECB COMMANDS DISABLE(Y/N)
DISK BASIC COMMANDS DISABLE(Y/N)
ONERR GOTO(Y/N)
```

Enter 'Y' or 'N' to each of the above options.

NOTE: Color Basic Commands are LIST, LLIST, EXEC, CLOAD(M), CSAVE(M) and POKE. Color Basic Functions are PEEK and USR. ECB Commands are DEL, EDIT, TRON and TROFF. Disk Basic Commands are LOAD(M), SAVE(M) and MERGE. The 'Y' or 'N' response applies to a WHOLE ROW of commands and not a part. For example, if you want to disable ONLY the 'EDIT' command but NOT the DEL, TRON, TROFF commands, you will have to answer 'Y' to the 'ECB COMMANDS DISABLE'.

If you answered 'Y' to any of the COMMANDS/ FUNCTIONS disables, the program will list those specific COMMANDS/ FUNCTIONS to enable you to enter your PASSWORD for EACH command. The following considerations should be kept

in mind when entering the passwords:

(a) Use LETTERS of the alphabet only. (No Lowercase)

(b) The number of letters in your PASSWORD should be EXACTLY the same as in the COMMAND / FUNCTION.

(c) Any part of the password or the whole password of one COMMAND / FUNCTION should NOT overlap with any other PASSWORD. For example, if you chose the word 'LAD' for the DEL command, you CANNOT use 'LADY' for the TRON command.

(d) Do not choose any password by simply reversing the letters of the COMMAND / FUNCTION for the sake of safety. For example, do not use TSIL as the password for LIST command.

ONERR LINE

If earlier you opted for the ONERR GOTO routine, enter the ONERR GOTO LINE NUMBER and press <ENTER>. Note: For ML programs, prefix the ONERR GOTO LINE NUMBER with '&H' to allow input in Hex.

ENCRYPTION CODE

If earlier you opted for the ENCRYPTION of your program, enter your codeword (max 50 characters) and press <ENTER>.

INITIAL FILENAME

Enter FILENAME A and press <ENTER>

SET ALL RAM IF 64K PRESENT

option. In case you have a 64K system and would like to set the 64K ALL-RAM MODE, enter 'Y' to this option. This will put the DISK ANTI-PIRATE Disable Routines in HIGH RAM and thus the various disables will NOT use up ANY memory from your program.

Save Anti-Pirate To Disk

Enter 'S' for this option. If you have MORE THAN 1 disk drive, insert YOUR disk in Drive 1 and insert the DISK ANTI-PIRATE disk in Drive 0. If you have only 1 disk drive, insert the DISK ANTI-PIRATE disk in Drive 0.

Enter the Source and the Destination Drive Number when the program asks you so. The Source Disk Drive is the one with the DISK ANTI-PIRATE disk. The Destination Disk Drive is the one with YOUR disk. For those with only 1 disk drive, enter 0 for both Source and Destination Drive Numbers.

Enter the appropriate filename and press <ENTER>. NOTE: The filename you enter now MUST NOT BE THE same as the FILENAME A and should preferably have an extension '/BIN'. For ML SUBROUTINES CALLED FROM BASIC, enter FILENAME A followed by the extention '/DSK'. Make a note of this filename(later to be referred to as FILENAME D).

If you have more than one disk drive, the program will copy the DISK ANTI-PIRATE routines from the Source to the Destination disk. If you have only one disk drive, switch the Source and Destination Disks when the program prompts you to do so. Press <ENTER> after you insert the appropriate disk. When the Backup process is complete, the program will return to the menu.

EXITING DISK ANTI-PIRATE

Press the <CLEAR KEY> till you get to the main menu. Then enter 'E' to exit DISK ANTI-PIRATE. If your program is in ML, enter the Starting and the Ending addresses of YOUR ML program, when the program asks you so.

Now load YOUR program saved under FILENAME A, either directly from Disk Drive 1 or by inserting YOUR disk in Disk Drive 0. If you earlier opted NOT to encrypt your program, skip to the section 'VERIFYING YOUR PROGRAM', otherwise follow the procedure given below.

(a) In case of Basic Programs, type: EXEC &H253 and press <ENTER>. Now save this ENCRYPTED BASIC PROGRAM using FILENAME A.

(b) In case of ML SUBROUTINES CALLED FROM BASIC, type: EXEC &H1D1 and press <ENTER>. In case of ML programs, type EXEC &H253 and press <ENTER>. In both cases SAVEM this ENCRYPTED ML PROGRAM using FILENAME A.

VERIFYING YOUR PROGRAM

You are now all set with your program. To verify your Basic or ML program, type: LOADM"filename" and press <ENTER>; where 'filename' is FILENAME D. Your program should display the title screen, if any, load and start automatically. Check for all disables and passwords.

In case of ML SUBROUTINES CALLED FROM BASIC, verify by RUNning your Basic Program.

MULTIPLE FILE LOADING

DISK ANTI-PIRATE includes a MULTIPLE FILE LOADING feature which allows you to load ANY

filename. For example if you have 4 different Basic Programs on a disk and DISK ANTI-PIRATE has been used for only 1 of the programs, this feature will allow you to load the other 3 programs also without going through the detailed procedure of using DISK ANTI-PIRATE. This feature will only work if all the 4 programs HAVE BEEN ENCRYPTED BY THE SAME ENCRYPTION CODE.

For Example if you have a program 'ALPHA/BAS' that has been encrypted by DISK ANTI-PIRATE and is loaded by 'LOADM "ALPHA/BIN"'and you want to encrypt and protect another Basic program 'BETA/BAS' without going thru the detailed DISK ANTI-PIRATE procedure, you would follow the procedure below:

(a) LOADM DISK ANTI-PIRATE. Enter Option 'P'. Then enter option 'D'. Define all the parameters. Use the same encryption code as for 'ALPHA/BAS'.

(b) Follow the procedure given under 'EXITING DISK ANTI-PIRATE' thru, but excluding 'VERIFYING YOUR PROGRAM'. Note: FILENAME A in this case will be 'BETA/BAS'

(c) To load the program 'BETA/BAS', type: LOADM"ALPHA/BIN":"BETA/BAS"

This procedure is OPTIONAL and also works with NONENCRYPTED Programs. It can ONLY be used from direct mode.

Note: If you decide NOT to ENCRYPT your program and to utilize the MULTIPLE LOADING FEATURE, simply follow step (c) in the example above.

BACKUP PROCEDURES

If you are planning to Backup your programs protected by DISK ANTI-PIRATE use the BACKUP command. The COPY command WILL NOT work.

QUESTIONS / COMMENTS

If you have any questions or comments about DISK ANTI-PIRATE, feel free to call us or write to us.

MEMORY REQUIREMENTS FOR PROTECTION FEATURES

FEATURE	NO. OF BYTES	
	BASIC	ML
RESET DISABLE	37	37
BREAK & CLEAR KEY DISABLE	62	36
COLOR BASIC COMMANDS	183	183
COLOR BASIC FUNCTIONS	80	80
ECB COMMANDS	112	112
DISK BASIC COMMANDS	99	99
ONERR GOTO	39	22