The!Ramdisk for The!Cart for Atari DOS 2.5

The!Ramdisk is a ramdisk driver for the cartridge The!Cart and Atari DOS 2.5. It uses the 512kB RAM of The!Cart to install a ramdisk with 4096 sectors of 128 Bytes. Because the maximum sector count of DOS 2.5 is 1040 an Enhanced Density drive is installed. The sectors form 1040 to 4095 can be used by any program via the low level RAM I/O of DOS 2.5.

Important:
This version only works with original Atari DOS 2.5.

How Does It Work

The program RAMCART.COM replaces the RAMDISK.COM delivered with Atari DOS 2.5. If you start it the first time you will probably get an output like this:

```
THE!RAMDISK FOR THE!CART AND DOS  2.5
THE!CART NOT FOUND
```

The reason is (beside The!Cart is not plug in) that the Configuration Lock is enabled. If you want to use The!Ramdisk, the Configuration Lock has to be disabled. For this you have to press <SHIFT> together with <RETURN> at the selection of a menu entry or <SHIFT> together with <ESC> at leaving the menu.

If you have select an entry with <SHIFT>-<RETURN> at a menu entry or left the menu with <SHIFT>-<ESC> the output should look like this:

```
THE!RAMDISK FOR THE!CART AND DOS  2.5
SET UP RAMDISK D:8
FORMAT RAMDISK
COPY DUP.SYS
CREATE MEM.SAV
```

Now the ramdisk is ready to use. Besides enabling the ramdisk furthermore the DUP.SYS was copied, MEM.SAV was created, and the drive to look up these files was set to D8:. If any error occurs during this process the DOS error code is displayed like this:

```
THE!RAMDISK FOR THE!CART AND DOS  2.5
SET UP RAMDISK D8:
FORMAT RAMDISK
COPY DUP.SYS
ERROR-   170
```

If DUP.SYS is not found on D1: then MEM.SAV is not created and the look up drive for DUP.SYS und MEM.SAV is not set to D8: but the ramdisk is ready to use.

Important:
Atari DOS 2.5 is patched to access The!Cart instead of the 130XE RAM. After starting RAMCART.COM it is not possible to use the original RAMDISK.COM any longer. If you save the DOS using command H then the patched version is saved.

After warm start or cold start (without power off/on) the ramdisk will still be in working order and be recognized. The output will look like this:

```
THE!RAMDISK FOR THE!CART AND DOS  2.5
SET UP RAMDISK D8:
```

How to Use The!Ramdisk without DUP.SYS and MEM.SAV

If you have already set up a ramdisk with DUP.SYS and MEM.SAV and you can get rid of them to save space. You have to do two task:

1) Delete DUP.SYS and MEM.SAV
2) Execute an cold start using DOS command M with address E477

The second step is important. Just deleting DUP.SYS and MEM.SAV would lock you out at a warm start or a switch from cartridge to DOS because DOS still looks at D8: for these files. After a cold start RAMCART.COM recognize the missing DUP.SYS and switch the look up drive back to D1:.

If you want to use DUP.SYS and MEM.SAV on ramdisk again:

1) Copy DUP.SYS to the ramdisk
2) Execute a cold start using DOS command M with address E477
3) Create MEM.SAV by using the DOS command N.

Modified DOS 2.5

The file Dos2.5TC.atr contains a modified DOS 2.5 version that already contains the patches necessary to access the RAM of The!Cart. You can identify this modified version of DOS 2.5 by the following version output:

```
DISK OPERATING SYSTEM II VERSION 2.5TC
```

The addition TC is the short for The!Cart.

The program RAMDISK.COM on this disk only initialize the Ramdisk on drive D8: but contains no patches. On the disk is en extra program called PATCH.COM. This program just contains the patches and can used to create a new modified version of DOS 2.5. It only patches DOS but not DUP so you will see no message or sign in DOS menu.

The advantage of the modified DOS is, that you can use the RAM of The!Cart without the program RAMDISK.COM. See the next chapter on how to use the RAM of The!Cart with your own program.

Using the Extra RAM

The low level Atari DOS 2.5 subroutines RAMIO ($1481) and SETBANK ($12CB) are replaced by RAMCART.COM, PATCH.COM and the modified DOS 2.5TC. No extra RAM is needed for the code. This means all your favorite locations like $100, $400, $600 etc. are still available for other tasks. The new RAMIO subroutine is able to access 512kB via 4096 sector of 128 Bytes. The sectors from 0 to 1039 ($0000-$040F) are used for the ramdisk. The sectors from 1040 to 4095 ($0410-$0FFF) are free and can be used by any program.

The following code shows how to use RAMIO to access a specific sector:

```
SECTOR     = $0500          ; your sector number
BUFFER     = $5000          ; your place to read/write (128 Byte)

; call RAMIO to get data from sector SECTOR to memory BUFFER
RAMIO      = $1481          ; address of FMS RAMIO
DISKBUF    = $0304          ; buffer address for read/write
DCBSEC     = $030A          ; DAUX1,DAUX2 containing sector number

           LDA SECTOR       ; get sector number low
           STA DCBSEC
           LDA SECTOR+1     ; get sector number high
           STA DCBSEC+1

           LDA #<BUFFER     ; set buffer address low
           STA DISKBUF
           LDA #>BUFFER     ; set buffer address high
           STA DISKBUF+1

           CLC              ; set read access, SEC for write
           JSR RAMIO        ; call FMS RAMIO
```

Important:
The new RAMIO always returns $01 in register Y (Atari DOS OK). It accepts any sector number in DCBSEC but ignores the four highest Bits of the sector number, e.g. sector number $1001, $2001, etc. reads/writes sector $0001.

If you want to check wether the The!Cart is available, you can use the following code:

```
TCMOSL     = $D5E6          ; mode select register of The!Cart
TCMOSLLOCK = $FF            ; either invalid mode -> locked
                            ; or register is not available
           LDA TCMOSL
           CMP #TCMOSLLOCK
           BEQ NOEXTRARAM
           BNE EXTRARAM
```

In general you should check the availability of the The!Cart because you would read/write to main memory in the case the extra RAM is not available.

Test Suite

The program RAMCARTT.COM is a test suit for the driver. It writes all 4096 sector and checks them afterwards. Because it writes ALL sectors, it destroys an existing ramdisk.