MASTER ALLOCATION TABLE Format of SINGLIX FS1, FS2 file systems

Offset	Item	DATA	Type	Size	Description of Item
0	MAT Sign	'MAT'	Char	3 byte	SINGLIX Disk Allocation Table Descriptor
3	FS MAT Version	XXh	Byte	1 byte	Must be 0 for Current/This MAT Version
4	Volume Size	XXXXXXXXh	Dword	4 byte	Volume (FS) size in sectors
8	Beginning Sector	XXXXXXXXh	Dword	4 byte	Volume (FS) beginning sector (LBA, Physical address)
12	DAT Address	XXXXXXXXh	Dword	4 byte	Beginning sector of the DAT (Offset value, this sector +1)
16	Sector Count	XXXXXXXXh	Dword	4 byte	Number of DAT sectors
20	Free Sectors	XXXXXXXXh	Dword	4 byte	Free sectors of the Volume/FS
24	First Free Sector	XXXXXXXXh	Dword	4 byte	First free sector of the Volume/FS
28	Reserved 1	XXXXXXXXh	Dword	4 byte	Operating system specific/reserved area 1
32	Reserved 2	XXXXXXXXh	Dword	4 byte	Operating system specific/reserved area 2
36	Reserved 3	XXXXXXXXh	Dword	4 byte	Operating system specific/reserved area 3
40	Reserved 4	XXXXXXXXh	Dword	4 byte	Operating system specific/reserved area 4
...	...	...	...	...	...
64	Reserved	XXXXXXXXh	Byte	448 byte	Unused/Reserved area

MAT (Master Allocation Table) is the header/descriptor of the Disk Allocation Table. Disk Allocation Table (DAT) has 1 bit pointers for every sectors of the volume/FS. Bit 0 points the lowest sector number in the DAT byte while Bit 7 points the highest sector number. If a bit is set it means relevant sector is free; if a bit is clear it means relevant sector is allocated or reserved.

Due to a possibility of any bad sectors in the DAT sectors. SINGLIX FS has ability to use different MAT/DAT addresses for the disk partition or the volume. At the FS initialization time or later, if DAT will have bad sectors, (OS) setup program will be able to change DAT to a new section of the FS/volume/partition.

DAT is comprised by consecutive, continual disk/FS sectors (just after the MAT as default). So, if there will be any bad sectors in the DAT, it is required to move DAT to a new section of the disk/FS. For example: For a 20 GB (41,943,040 sectors) TR-SINGLIX FS partition, DAT size is 10240 sectors or 10 MB. If there is no 10240 continual/consecutive free (non-bad) sectors at the beginning of the volume just after the MAT sector, after the FS boot sector, FS format program must locate the DAT to proper section without any bad sectors, with minimum 10240 continual/consecutive free disk/fs/partition/volume sectors. DAT bytes point 8 sectors, offset value of a DAT byte means 8 * LBA offset address of the sector from the beginning of the file system.

Operating system will use volume beginning sector and free sectors area of the MAT. It will calculate and update free sectors value by adding or subtracting allocation procedure results (after deleting allocated sectors or allocating sectors). Or after checking free sector value, if it finds invalid value on there, it will calculate free sectors by checking DAT completely. (First free sector value update procedure will be performed by using some logic.)

Reserved areas on the MAT are for future versions of the FS and Operating System and also operating system specific calculations. (For example: The largest continual/consecutive free sectors value and beginning location of the largest continual/consecutive free sectors section. That is optional usage of the MAT but before MAT offset 64, it must be remembered that SINGLIX OS will be able to use these areas as specific calculation areas; so, for compatibility purpose, MAT offset 28 to 64 are TR-SINGLIX Operating system specific areas, and they will be declared later when SINGLIX operating system development stage is completed. They are unused MAT areas/fields for now.)

Because of SINGLIX FS uses Section Headers (FDT, DDT and others) in the partition/volume, it is possible to recover defective DAT section after any bad sector occurrence in the DAT. The recovery program must relocate DAT to proper location, rebuilding DAT by checking headers/descriptors and signs on the partition/volume.