Disk layout of Emulator I floppy disks

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Log of Changes

Date	Version	Description
08 Nov 2010	0.8	Initial version: - reverse engineering based on signal capturing done with a Digital Storage Oscilloscope on the Shugart interface between the Z80-based proprietary floppy disk controller and the floppy disk drive in the Emulator I - all details of the disk format released
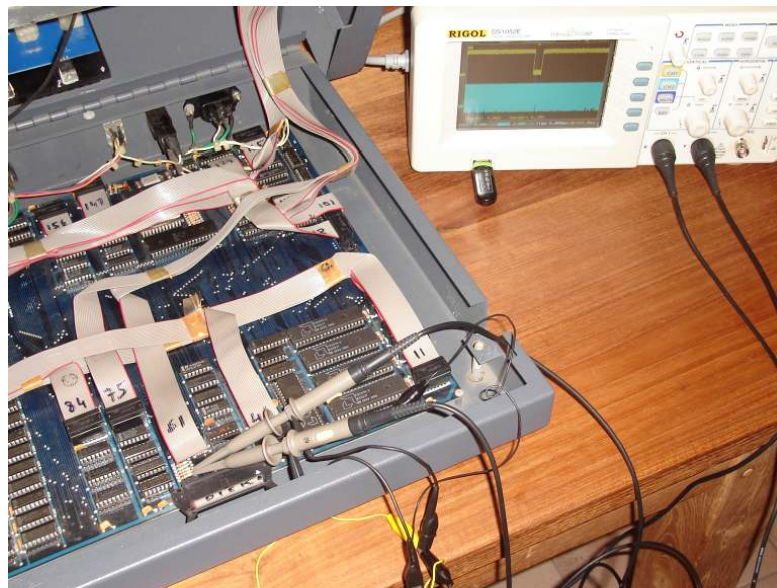
The E-Mu Emulator uses a Shugart 400L disk drive, which is capable of formatting *single sided* 5.25" disks holding *40 tracks* with a total maximum capacity of 180kbytes. In the Emulator only 35 tracks are used.

- Tracks 0 → 1 are used for the Operating System
- Tracks 2 → 17 are used for the Lower sounds
- Tracks 18 → 33 are used for the Upper sounds
- Track 34 is used for Sequencer data

Disk format specifications:
- SSDD soft sectored 5.25 disks (DSDD disks will work fine too)
- Drive spins at 300 RPM
- FM encoding
- Data transfer rate: 310 kbits/second (including FM clock pulse bits), 155 kbits/second (data bits only)
- 1 side

- 35 tracks
- 1 sector per track
- 3584 bytes/sector
- Sync of track starts after (initial=) falling edge of the (negative) index detection pulse
- Each track is built up as follows:
  - GAP: 24 bytes FFh (but to avoid calibration issues, it is recommended to count less of these sync bytes, e.g. the last 20 ones)
  - SYNC: 4 bytes 00h
  - Mark: 2 bytes FAh 96h
  - ID: 1 byte = track number (from 00h → 22h)
  - CRC of ID: 2 bytes: direct CRC-16 method with polynomial 8005h, initial CRC value 0000h, final XOR value 0000h
  - SYNC: 2 bytes 00h
  - GAP: 7 bytes FFh
  - SYNC: 4 bytes 00h
  - Mark: 2 bytes FAh 96h
  - Data: 3584 bytes
  - CRC of data: 2 bytes: direct CRC-16 method with polynomial 8005h, initial CRC value 0000h, final XOR value 0000h
  - SYNC: 2 bytes 00h
  - GAP: 48 bytes FFh (but detecting less of them, e.g. 40 bytes should be sufficient)