

# CD Audio – Technical Conditions



These technical conditions describe the acceptable source data and materials, including documentation required for the CD Audio production in the company GZ Digital Media, a. s. The customer has the duty to get acquainted with them prior to placing the order. The source data not mentioned in these technical conditions, or source data, which are inconsistent with these conditions, should be consulted in advance with a pre-mastering engineer.

## 1 Technical Specifications

Technical parameters of source materials for the production of a “CD Audio” format must conform to the specification of the **Red book** standard. If the supplied source materials do not conform to this specification, they will be adjusted in the pre-mastering, or will be rejected as nonconforming, should it be impossible to adjust them.

### Number of channels:

Specification according to the standard: 2 channels (stereo)

The source data in mono recording will be transferred in stereo, both in the left and right channels. It is possible to encode the multiple track recordings using the technology Dolby Surround (Pro Logic I or II), or to mix them into stereo.

### Sampling frequency:

Specification according to the standard: 44.1 kHz

The source data with sampling frequencies 32, 48, 88.2, 96 and 192 kHz will be digitally re-sampled.

### Quantization:

Specification according to the standard: 16 bits

It is possible to deliver the recordings with resolution up to 32 bits. At the transfer there will be used the upper 16 bits. Optionally it is possible to use the algorithms for the bit reduction, which will use even the information in lower bits.

### Pre-emphasis:

Pre-emphasis may not be changed during one track. The interval between tracks, in which the pre-emphasis is being changed, must amount at least to 2 seconds.

### SCMS:

Unless specified otherwise in the documentation or supplied source data, a tag of digital copying will be set up at “forbidden” for the pressed CDs.

### Length of programme:

Maximal length of programme for CD Audio is 80 minutes.

### ISRC codes:

ISRC codes may be stored on a functional CD-Audio master, in DDP data, in CD image or may be supplied in the accompanying documentation (tracklist).

**Bit reduction:**

If the supplied input medium was produced from a multiple-bit recording using the algorithms for the bit reduction (for example SBM, UV22, HDCD, etc.), it is necessary to inform about this fact in the documentation. As for algorithm HDCD, this obligation is set forth in the licensing conditions.

**Record level:**

The digital level of input source medium will be transferred to the CD without changes (recording on a pressed CD will have the same number of bits as the supplied source medium), unless specified otherwise by the customer in the order.

**Limitations for PQ coding, offsets:**

Maximal number of tracks: 99

Maximal number of indexes in one track: 99

Minimal length of track (without the initial gap): 4 seconds

CD offset (gap before the 1st track): at least 2 seconds (150 frames)

PQ offset before the 1st track: 50 frames are recommended

PQ offset at the beginning of the 2nd track and next tracks: 25 frames are recommended

PQ offset at the end of track: 12 frames are recommended

PQ offset after the last track: 75 frames are recommended

1 second = 75 frames

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Formats of input source media

**1.1 Complete master**

Contains all data in the format, which is directly usable for the production by pressing without necessity of carrying out any changes or adjustments. The studio will carry out only the check of the supplied master, and if required or suitable, the studio will carry out the adjustment of master so that it would meet the standards and recommendations of Philips/Sony.

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CD Audio master

Fully functional pressed or burnt disk in the CD Audio format playable in a CD desk player (see 3.1). We do not accept the shaped CDs, business cards, etc.

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DDP (Disk Description Protocol) format

Worldwide standard for handing-over the source data for production of optical disks supported by all manufacturers of equipment for CD and DVD mastering, as well as by manufacturers of professional workstations for processing of audio or DVD authoring.

For CD Audio we recommend the version 1.00. We also accept the version 2.00.

If your authoring software supports it, choose in the setting-up the option for storage of audio tracks in one file.

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CMF (Cutting Master Format)

It is similar to DDP. CMF is transferable to DDP. If your workstation supports both DDP and CMF, select the option DDP.

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Files with CD Audio image

Files, which can be used without any adjustments for the CD Audio master burning, thereby can be transferred to the case 2.1.1.

Recommended formats:

- ⑩ NRG (Nero)
- ⑩ BIN/CUE/CDT (CDRWin, Toast, etc.)

Acceptable formats:

- ⑩ C2D (WinOnCD)
- ⑩ CIF (Easy CD Creator)
- ⑩ CCD/IMG/SUB (Clone CD)
- ⑩ CDI (DiscJuggler)
- ⑩ IBP/IBQ (IsoBuster)
- ⑩ MDF/MDS (Alcohol 120%)
- ⑩ BWT/BWI, B5T/B5I, B6T/B6I (BlindWrite)
- ⑩ TOAST, CDR (Toast, Apple Disk Utils)
- ⑩ UIF (MagicISO)

## 1.2 Physical audio carrier

It is an analogue or digital carrier containing the continuous recording of programme. The division of programme into tracks is realized by means of technical facilities of a specific player (ID marks in the time track) or by means of the accompanying documentation.

## 1.3 Audio files

They can not be used directly for the production by pressing. At first the data must be processed in pre-mastering and a master must be produced. The processing includes the check of supplied files according to the Red Book standard, possible adjustments specified by the customer in supplied documentation, compilation of the disk image from the particular files, setting of the starts and ends of the particular compositions (PQ coding) and the final verification of function of the resulting master.

Unsupported formats must be consulted in advance with the pre-mastering engineers.

### 8 Recommended formats:

- ⑩ WAV (Windows PCM) – uncompressed audio
- ⑩ AIF, AIFF (Apple Macintosh) – uncompressed audio
- ⑩ APE (Monkey's Audio) – lossless compressed audio, including the detection of errors
- ⑩ FLAC (Free Lossless Audio Codec) - lossless compressed audio, including the detection of errors

### 9 Unsuitable and non-recommended formats:

Compressed audio with loss in the formats:

- ⑩ MP3, MP2, MP1 (MPEG-1 Layer 3, 2 and 1)
- ⑩ MP4, AAC, M4A (MPEG-4, Advanced Audio Coding)
- ⑩ AC3 (Dolby Digital)
- ⑩ DTS (Digital Theatre System Coherent Acoustics)
- ⑩ WMA (Windows Media Audio, Microsoft)
- ⑩ OGG (Ogg Vorbis)
- ⑩ MKA (Matroska Audio)
- ⑩ MOV (QuickTime)
- ⑩ RA, RM (Real Audio, Real Media)

### 10 Unacceptable formats:

- ⑩ files with the DRM protection preventing from playing on unauthorized players, for example files with the filename extension M4P (format AAC with DRM protection)

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12 Physical carriers

Scope of liability for damage: Company GZ Digital Media, a.s. is liable for damage or loss of the medium only up to the price of new medium, not for the price of the medium content.

Physical carriers must be readable in the entire length of the programme. In the event that the supplied carrier contains non-correctable errors of reading, the processing of order will be suspended. The customer will be asked for supplying new source data.

The particular carriers must be unambiguously identifiable in accordance with the supplied documentation and order (catalogue number, customer). The description must also contain the format of data, which are stored on the carrier (for example CD Audio master, DDP master or WAV files). The description must appear both on the cover and on the medium itself. However, it must not prevent its error-free reading (self-adhesive labels and stickers, description of CD media using a hard-core pens, etc.).

If one data carrier contains the files for more titles, the files must be stored in a separate folder named according to the catalogue number, in accordance with the supplied documentation and order.

Recommendation: For the production, please send always a copy of your original master. We recommend sending 2 identical copies clearly identified as master and backup copy. We will use the backup copy in order to minimise the risk of delays that could occur in case of master readability failure, in which case the material would need to be sent again.

#### **1.4 Pressed or burnt optical disk - CD Audio master**

Fully functional pressed or burnt disk in the CD Audio format playable in a CD desk player, and with the content according to point 2.1.1. We do not accept the shaped CDs, business cards, etc.

#### 13 Methods of recording on CD-R(W):

- Ⓜ singlesession (DAO - Disk At Once) – RECOMMENDED
- Ⓜ multisession (SAO - Session At Once) – acceptable
- Ⓜ recording by tracks (TAO - Track At Once) – NOT recommended, such a burnt disk can not be used directly for production without additional adjustments.

#### 14 Instructions for burning the CD-R(W)

- Ⓜ Use only high quality media from a major brand, preferably the higher versions from the relevant manufacturer.
- Ⓜ Use lower recording speeds, maximally 16x (according to the possibilities of the driving mechanism). At higher recording speeds there will occur the step change of burning speed and operation of laser (zone burning). Thereby the readability of disk is worsened.
- Ⓜ Supply a PQ list and the error checking protocol for CD-R(W), if it is available.
- Ⓜ Not cover the CD with paper tapes or other self-adhesive tapes; however it is possible to use the technologies for burning of graphic information on the side of disk labelling (LightScribe, etc.).
- Ⓜ Describe the medium only on the labelling side, and only with a felt tip marker intended for that use. Common felt tip markers are not suitable. Using hard-core pencils and ballpoints will damage the medium.
- Ⓜ We recommend test-listening of the recording in the desk player prior to sending it to the production, and also checking the correct display of CD-Text, if required.

#### **1.5 Optical disks CD-R(W), DVD-R(W), DVD+R(W) with data content**

Those are disks in the format of CD-ROM or DVD-ROM with the content according to the points 2.1.2 - 2.1.4, 2.3. Disks must contain a compatible file system (ISO9660, Joliet or

UDF). One carrier may contain the data for more titles.

### 1.6 Hard disk

We accept all sizes of hard disks (3.5", 2.5"), all applicable possibilities of connection (IDE, SCSI, SATA, eSATA, USB, Firewire, LAN).

We recommend using the external disks; however we also accept the internal disks.

One disk may contain the data for more titles.

Format of disk:

- Ⓢ NTFS (Windows 2000, XP, Vista) - we recommend
- Ⓢ FAT32 (Windows 9X) – we accept (the maximal size of file is 4294967294 bytes)
- Ⓢ EXT2, EXT3 (Linux) – we accept
- Ⓢ HFS (Apple) – we accept

### 1.7 Storage media

We accept the following memory cards: SD, SDHC, XD, MMC, Compact Flash, Memory Stick and storage media USB Flash disk.

One storage medium disk may contain the data for more titles.

### 1.8 Obsolete media

We also accept for the CD Audio production the following audio carriers, which are not being used very often today:

- Ⓢ R-DAT
- Ⓢ Mini Disc (we do not recommend it because of lower quality caused by the lossy compression ATRAC)
- Ⓢ 1/4" analogue tape

For more information contact the pre-mastering engineers.

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16 Data transmission via FTP server

The source data for production transmitted via FTP server must contain the check elements enabling the verification of data integrity prior to the production itself. Without check elements it is impossible to guarantee the conformity of files received by the manufacturer to the original files on the side of customer.

The orders, which do not contain the check elements, are suspended until the customer sends the data in acceptable format. If the customer insists on the production from non-secured data, he will assume all risks related to any possible undesirable changes of data during its transmission and storage.

The check elements can be supplied in one of the following ways:

### 1.9 Source data packed in the archive

The files representing the image of disk, DDP, CMF or individual audio files, which do not contain any check elements (for example WAV), must be packed in one single file that can contain even the documentation.

Acceptable formats of archive files: ZIP, RAR, SIT, 7Z, ARJ, ACE, other formats might be accepted only with prior agreement with the pre-mastering department.

### 1.10 Format of source data, which already contains the check elements

UIF – compressed format of CD image with the check elements

APE, FLAC – lossless compressed audio formats with the check elements

### 1.11 The check code supplied separately

As for the files, which do not contain any check elements and are not packed in archive file, there must be supplied the check codes for them, by means of which it is possible to verify any damage to data or an unauthorised manipulation with data.

We accept the codes MD5, CRC32 and SHA1. The code must be calculated separately for each file and a “List of files with checking codes” must be attached to the documentation. The check codes can be created using for example the programme HashCalc, which may be used free of charge.

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18 Location and identification of data and audio files

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If the customer supplies the source data in the form of files on a data carrier or via FTP transmission, there must be chosen such location into folders and names of files so that the data identification would be unambiguous, and in accordance with the supplied accompanying documentation and order.

The observance of all below mentioned recommendations will secure the continuous and problem-free processing of the whole order and reduce the risk of production delay or even of mistake of data.

The source data saved on FTP into a disk space allocated to the customer, or saved on a data carrier must be located in a folder with the name, which is identical to the catalogue number of title. Any file or directory, even inside the archive, must not contain any inadmissible characters of operating systems for PC and Apple Macintosh: / \ > < : \* ? |

Depending on the data format proceed in the following way:

### 1.12 Complete master

We recommend naming the file of disk image or archive with files according to the catalogue number of order and not adding any additional information to the name (date, etc.).

### 1.13 Particular files

If the file contains the audio data for track (composition), the file name should contain the order of track from the beginning of CD and the name of composition (for example “02\_Song\_Name.wav”).

The name of each particular file in the supplied source data must be identical with the information in tracklist for the correspondent track.

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21 Documentation

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The documentation must unambiguously and undoubtedly identify the supplied source data so that it would enable making a decision about the accuracy of data during the input check and subsequent processing. It is necessary to specify mainly all non-standard elements and abnormalities, such as hidden track, errors allowed within the recording, intentional exceptions to the specification, required protections against copying, etc.

The processing of orders (titles) without the required documentation is suspended until the customer supplies the source data and documentation conforming to the technical conditions. If the customer insists on the production without the documentation supplied, he will assume all risks related mainly to the mistake of titles or mistake of compositions.

The documentation must contain the following information:

### 1.14 Identification information

Catalogue number, name of customer, name of title and interpreter, etc

### 1.15 Information about source data supplied

23 Type of source data supplied

24 Location of source data on FTP server: directory and name of file

25 Format of source data (CD Audio master, DDP, disk image, individual files)

### 1.16 Description of the resulting product

26 Tracklist

Tracklist must contain the order, names and times of the individual tracks and total playing times. We also recommend specifying the lengths of gaps between the tracks. Should the CD contain text information in sub-code tracks, this fact must be stated in the documentation (CD-Text see below, ISRC code for the correspondent track, UPC/EAN disc code).

27 Hidden and bonus tracks

The requirement for a non-standard bonus track (a song or spoken commentary) hidden in the gap before the first track must be specified in the order and tracklist (including the length of bonus).

Should the last track contain a long section of silence and/or another, bonus track, it is necessary to specify this fact in the tracklist. It is also necessary to specify the length of gap and the length of bonus track and whether it has to be coded as a separate track or it has to be a part of the previous track.

28 CD-Text

The CD-Text information may be saved in the source data already supplied (on a functional CD Audio master, in DDP data, in CD image) or may be supplied in a text file. Absolutely exceptionally, if no other possibility exists, as a hard copy. They enable displaying the additional information such as the name of composition, interpreter, author of music, author of text, etc., on the displays of compatible desk or software playback devices.

As for the information saved in the CD-text, it is possible to use only the characters from the set ISO 8859-1 (i.e. without diacritics, national and special characters – sharp S, vowel mutations, hooks, character &). Although some DVD players and most of software players supporting the CD-Text can display some non-standard characters, it is however recommended to transfer the text in order to keep the compatibility with all playback devices.

Syntactical errors and spelling errors of CD-Text in the source data supplied (for example in the files of CD image) are corrected only if the correct wording is specified in the CD-text documentation. The text in documentation has the priority. In the event of uncertainties the title is suspended and the customer will be asked for a correct wording.

If on the source material supplied there are saved any CD-Text information, which are evidently not related to the resulting product (for example names of compositions Track1, Track2, ..... ) and at the same time are not specified in the documentation, they will be deleted. They are usually created - unknown to the user - by some burning programmes, which always generate the CD-Text – for example from the names of files or from information contained in them (ID3 tags).

Without filling in the name of the entire CD and interpreter of the entire CD, and all names and interpreters of the individual compositions there exists a risk that some playback devices will not display correctly the CD-Text information, or will not playback the disk at all.

Information concerning the entire CD:

- Ⓢ **Disc ID** – according to the recommendation of standard the ID should be stated in the following sequence: catalogue number, name of the company (publisher) and year of issue. All items displayed are separated by a slash.
- Ⓢ **Genre** – music style (list of genres defined in advance, for example JAZZ, POP, .....)
- Ⓢ **Subgenre** – specification of music style (text information)
- Ⓢ **Title** - name of CD title (mandatory data)
- Ⓢ **Performer** (artist, interpreter) - artist or band singing, playing or speaking – for the entire CD. In the event of compilation it is usually stated: “various”, “verschiedene”, “ruzni”, etc.

Information concerning individual tracks (compositions):

- Ⓢ **Title** – name of composition (mandatory data)
- Ⓢ **Performer** (artist, interpreter) – artist or chorus singing, playing or speaking
- Ⓢ **Songwriter** (lyrics) – author of text, lyricist
- Ⓢ **Composer** – composer, author of music
- Ⓢ **Arranger** – arranger of composition
- Ⓢ **Message** – arbitrary message
- Ⓢ **Info** – additional information, which are not displayed on display, but yet are saved on the CD