YAMAHA

MD4

MULTITRACK MD RECORDER

Questions and Answers

Preview version

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MD / Recorder

1. What is MD?

MD stands for Mini Disc, which is a type of media that allows you to perform magneto-optical digital recording. It first appeared on the market in 1992. Its main features are Random access, good sound quality, Easy Song editing, and compact size.

2. Why was MD selected as media?

MD is removable and easy to handle and reasonably priced. Its quality and future supply are ensured.

3. What is the available recording time in 4TR, ST and mono modes?

Recording time:37 minutes for 4 track; 74 minutes for Stereo; and 148 minutes for mono. So, recording time is proportional based on how many tracks are used.

4. What is the difference between MD Data and normal MD?

Normal MD is called "Mini Disc," and is used only for mono and stereo audio signals. MD Data was originally developed to save computer data and other general-purpose data (such as digital camera data). It can also work with handle mono, stereo, and four-channel audio signals.

5. Does the Yamaha MD4 accept a normal MD (Mini Disc)?

A normal Mini Disc can be played back, but cannot be recorded on by the MD4. If you insert a normal Mini Disc in a Yamaha MD4, the MD4 will not enter recording mode. (Only playback is available.)

6. What is compression? What is ATRAC?

Even though Mini Discs are only 64 mm in diameter, they can store up to 74 minutes of stereo audio, which is the same as the standard 120 mm audio compact disc. To achieve this data capacity, audio data is compressed using Sony's ATRAC (Adaptive TRansform Acoustic Coding) system. Using the ATRAC system, the Yamaha MD4 provides a four-track recording time of 37 minutes.

ATRAC uses established psychoacoustic principles to compress audio data to about one-fifth of its original size, with virtually no loss in sound quality. For example, the sensitivity of the human ear is frequency dependent. Two tones of the same level but at different frequencies will not be heard at the same loudness. Another principle used is the "masking effect". That is, softer sounds become inaudible when louder sounds at similar frequencies are present. ATRAC uses both of these principles to compress the audio data.

ATRAC also employs a variable bit length technique, whereby bits are allocated to data depending on signal amplitude. For example, a low level signal does not require as many bits as a high level signal. So rather than waste 8 bits on a 5-bit value, ATRAC removes the 3 unused bits, thereby reducing the amount of data.

7. What does the frame indication mean?

One second consists of 86 frames. Since the data is compressed by units of 11.6ms (512 sample @44.1 kHz) based on the ATRAC system, a frame is obtained by dividing one second by 11.6 ms.

8. What does "resolution is 11.6 ms" mean?

This is the unit of one frame (11.6 msec) of resolution. Since each compression block is 11.6ms (0.0116 second), this is the minimum unit for recording and editing.

9. Why is it possible to perform ping-pong recording while playing back four tracks simultaneously?

The MD4 handles data compressed to about one-fifth of its size and length of time. In addition, random access capability will locate the playback point immediately for recording. Therefore, the Yamaha MD4 has enough room to record and play back data at the same point in the same channel.

10. Doesn't data slip when overdubbing due to data compression?

The compression and expansion process takes some amount of time. The Yamaha MD4 has a special dedicated circuit that compensates with a time offset for overdubbing and ping-pong recording.

11. How does the Yamaha MD4 identify and differentiate the MD Data from the Mini Disc?

The shape of one corner is different: tapered or round. Also, the TOC in the disc itself contains a code that identifies the disc.

12. Is there any sound degradation after repeated ping-pong recording?

No apparent degradation will occur, thanks to digital recording. However, since the ping-pong operation is performed on an analog mixer, after many repeated ping-pong operations a slight degradation may be noticed. This is still much better than a cassette recorder.

13. How long is the life of a disc?

No degradation occurs, even after one million instances of repeated recording/playback. It has an indefinite life time, as long as the disc is not damaged physically.

14. How long is the pickup laser life?

Almost the same as CD players.

15. Does the compression process lower the sound quality?

ATRAC system offers virtually no audible loss in sound quality.

16. Is there a "No Compression" mode that sacrifices total recording time?

No, the ATRAC process is always applied.

17. What types of information can be stored in the disc using the MD4?

TOC(Table of Contents) can save the start/end locate information of each song, remaining recording time, and the title of a disc and each song, and eight MARK points in each song, which can be edited by users.

18. Does a disc have a front and back side?

Yes. You cannot insert a disc upside down.

19. What will happen if a 4TR disc created on the MD4 is inserted into a normal MD (Mini Disc) player?

The MD data disc cannot be played back on a normal Mini Disc player.

20. Does the unit have any protection against skipping sounds due to shock or vibration?

Buffering memory is equipped for continuous playback. It holds about 10 seconds of data.

21. The unit employs a magneto-optical system. Is it OK to place the unit on a TV?

The disc can be re-recorded based on the opto-thermal magnetic recording. A point on a disc is heated by a laser beam above the Curie temperature and then applied to a magnetic field to overwrite the data. Therefore, simply applying an external magnetic field does not modify the MD data.

22. How quickly can the MD4 locate a point?

The random access/quick locate facility, like a CD player, cannot be allowed on a tape-based multitracker.

23. What is SONG Search?

It is equivalent to the Track Search function on CD players that locates the beginning of a song.

24. Is the Repeat operation continued endlessly, or stopped after a given number of repetitions?

It will continue endlessly until you press the STOP key.

25. Is it necessary to format the Mini Disc?

No. Formatting is not required. This is convenient.

Function

26. Why does the Yamaha MD4 have no digital outputs?

A normal Mini Disc player adopts the SCMS (Serial Copy Management System), and creating a second-generation digital copy is prohibited. The Yamaha MD4 can play back a normal Mini Disc, though the MD4 is an MD data format recorder, which, from the copyright point of view, may confuse customers. We decided not to implement digital outs this time.

27. Is the mixer section digital?

It is analog.

28. Can you synchronize two or three units?

It is impossible with this model.

29. Does it have a song naming function?

Yes. Each song and disc can have a name, which can be input on the MD4.

30. Is MMC (MIDI Machine Command) supported?

No. The Yamaha MD4 is compact, desktop, standalone equipment that includes a mixer section. The MD4 will not frequently be remote controlled. However, the MD4 has an MTC (MIDI time code) out function that allows you to use the unit as timecode master to synchronize a music sequencer.

31. What is Cue List play?

Cue List play is one of the functions in UTILITY. Each song can have up to 8 Mark points. Using these Mark points in any order will allow you to make a Cue List of up to 9 steps. The MD4 plays back data based on this list. Also, the number of repeats can be set for Cue List play.

32. Can you sort songs or divide a song?

One song can be divided into two songs. These divided songs can be combined again. (You cannot combine songs that originally had different song numbers.) But you cannot change the order of songs or relocate them (that is, the Cut and Paste operation), with the exception of the Program Play function, which allows you to change the playback sequence.

33. Is external synchronization possible?

No.

34. What are the precautions for using the unit?

The operating temperature is 5 to 35 degrees Celsius. The unit is a precision device. Handle the cartridge gently and with care.

35. How to use MTC out.

MTC stands for MIDI Time Code. The Yamaha MD4 operates only as a timecode master of MIDI sequencer. In this case, MTC is output at 0:00, the beginning of each song. The MD4 does not have MIDI In/Out.

36. Is there SONG Copy (buck up) function?

Yes.

The song Copy function allows you to copy an entire song. You can restore the original song if you make mistakes during editing.

Availability

37. Will disc supply continue for years, like cassette tapes?

Like CDs and 3.5" floppy disks, the standards of the MD format are open to anybody based on a licensee fee. SONY will support supply for a long period of time due to its responsibility as licenser.

38. Is the MD4 compatible with other manufacturers' discs?

MD data discs manufactured by SONY and TDK are currently compatible.

39. Are there any types of MD data?

Only one type: 140MB.

40. Where can we buy discs?

Since it is currently difficult to obtain discs, Yamaha will purchase SONY MD data discs to supply to the MD4 dealers.

41. Why is an MD Data Disc more expensive than an MD Audio Disc?

Due to the relationship between demand and supply, the number of MD Data discs in the market is still small. That’s why they are more expensive than MD Audio discs. However, the price will go down in the future in accordance with increasing applications with MD data disc such as digital cameras and computer data.