

SONY®

MDS-E12/E11/E52

RS-232C INTERFACE MANUAL

1	Outline		
2	Physical connection		
3	Communication conditions of RS-232C		
4	Communication packet format		
5	Remote mode		
6	Transmission data		
6.1	Structure of this section	6.40	REC REMAIN REQ
6.2	REMOTE MODE	6.41	NAME REMAIN REQ
6.3	POWER	6.42	DISC NAME WRITE
6.4	PLAY	6.43	TRACK NO. NAME WRITE
6.5	STOP		
6.6	PAUSE ON/OFF	7	Transmission data
6.7	PAUSE ON	7.1	Structure of this section
6.8	FF/REW OFF	7.2	REMOTE MODE
6.9	REW	7.3	POWER
6.10	FF	7.4	PLAY
6.11	PREV TRACK	7.5	STOP
6.12	NEXT TRACK	7.6	PAUSE
6.13	REC	7.7	REC
6.14	TIME MACHINE REC	7.8	REC PAUSE
6.15	EJECT	7.9	EJECT
6.16	AUTO PAUSE	7.10	MODEL DATA
6.17	TRACK PLAY	7.11	STATUS
6.18	TRACK PAUSE	7.12	DISC DATA
6.19	ELAPSED TIME	7.13	MODEL NAME
6.20	DIVIDE MODE REQ	7.14	REC DATE DATA
6.21	DIVIDE ADJUST	7.15	DISC NAME
6.22	DIVIDE REQ	7.16	TRACK NAME
6.23	COMBINE MODE REQ	7.17	ALL NAME END
6.24	COMBINE REQ	7.18	ELAPSED TIME
6.25	EDIT MODE CANCEL	7.19	REC REMAIN
6.26	ERASE REQ	7.20	NAME REMAIN
6.27	MOVE REQ	7.21	TOC DATA
6.28	UNDO REQ	7.22	TRACK TIME DATA
6.29	MODEL REQUEST	7.23	DISC EXIST
6.30	STATUS REQ	7.24	1 TRACK END
6.31	DISC DATA REQ	7.25	NO DISC NAME
6.32	MODEL NAME REQ	7.26	NO TRACK NAME
6.33	REC DATE REQ	7.27	WRITE PACKET RECEIVED
6.34	TOC DATA REQ	7.28	NO TOC DATA
6.35	TRACK NO. TIME REQ	7.29	ENTER DIVIDE MODE
6.36	DISC NAME REQ	7.30	ENTER COMBINE MODE
6.37	TRACK NO. NAME REQ	7.31	EDIT COMPLETE
6.38	ALL NAME REQ	7.32	DIVIDE POINT DATA
6.39	NAME CANCEL	7.33	UNDEFINED COMMAND
		7.34	IMPOSSIBLE
		8	Command quick reference

1 Outline

This manual has the technical information necessary to control the MDS-E12/E11/E52 with the RS-232C.

- Section 2 Explanation about the connection between MDS and PC.
- Section 3 Explanation about the communication conditions to communicate between the RS-232C and MDS.
- Section 4 Explanation about the packet format to be used for communication between MDS and PC.
- Section 5 Explanation about the remote mode which controls MDS independently of the main unit.
- Section 6 Explanation about each command to control MDS.
- Section 7 Quick reference which is the summary from section 1 to 6.

In this manual, "MDS" is substituted for MD RECORDER, and "PC" is substituted for the equipment which controls MDS.

As for the numbers, the hexadecimal number is shown in *Italic* with "*H*" in the end.

Example: 18 (decimal) = 12H (hexadecimal)

2 Physical connection

Form of the connector for the RS-232C equipped with MDS, name of the pins and the cables for connection are mentioned in this section.

2-1 Form of the connector and name of the pins

D-Sub9 male pin is used in MDS-E12/E11/52 at the RS232C connector.

The names of pins are shown as below.

Pin number	Name
1	OPEN
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	OPEN

Among them, the signal lines of 2:RXD, 3:TXD and 5:GND are connected to MDS. 4:DTR is connected to 6:DSR and 7:RTS is connected to 8:CTS inside MDS.

2-2 Connection of the cables necessary for control

Connections as follows are the minimum requirements to control MDS from PC.

MDS name	Pin number		PC name	Pin number (D-Sub9 male pin)	(D-Sub25 female pin)
RXD	2	←→	TXD	3	2
TXD	3	←→	RXD	2	3
GND	5	←→	GND	5	7

Connection cables to meet these requirements are commercially available as what are called "cross cable" or "interlink cable" .

3 Communication conditions of RS-232C

Communication conditions of RS-232C are shown as follows.

Baud rate : 9600 bps
Character length : 8 bit
Parity : No parity
Stop bit : 1 bit

Details of data format etc. are explained from section 4 onward.

4 Communication packet format

The packet used in communication between MDS and PC is mentioned in this section.

4-1 Packet structure

It is changeable data length and composed of the following factors.

1	Header
2	Packet length
3	Format type
4	Category
5	Data
6	Terminator

The maximum packet length is 32 byte.

4-1-1 Header

Header is different between the packet transmission directions, that is PC->MDS or MDS->PC.

PC->MDS : <i>7EH</i>
MDS->PC : <i>6FH</i>

4-1-2 Packet length

Byte value from header to terminator.

The maximum packet length, 32 byte, occupies the value in the range from *05H* to *20H*.

4-1-3 Format type

The value of this factor always occupies *05H*.

4-1-4 Category

The value of this factor always occupies *47H*.

4-1-5 Data

According to the value of this factor, a control command or a request of condition is sent from PC to MD.

And besides, a reply for control command or a current condition is sent from MD to PC. Details about these data is explained from section 6 onward.

4-1-6 Terminator

The value of this factor always occupies *FFH*.

4-2 Summary

When some data are sent from PC to MDS, packet structure is shown as follows.

Header	Packet length	Format type	Category	Data	Terminator
<i>7EH</i>	Packet length	<i>05H</i>	<i>47H</i>	Data....	<i>FFH</i>

And besides, when PC receives some data from MDS, packet structure is shown as follows.

Header	Packet length	Format type	Category	Data	Terminator
<i>6FH</i>	Packet length	<i>05H</i>	<i>47H</i>	Data....	<i>FFH</i>

Details about these data is explained from section 6 onward.

5 Remote mode

5-1 What is remote mode?

In MDS, processing way for RS-232C is different between during remote ON and during remote OFF.

To carry out the request from RS-232C, send off the remote ON command at first to set the MDS itself to remote ON mode.

When MDS is not in remote ON mode, it does not reply to a command from RS-232C.

5-2 Condition of MDS during remote ON

MDS with remote ON is capable of accepting any command via RS-232C.

When MDS enters remote ON mode, MDS stops all workings and forcibly enters “STOP, REPEAT OFF and CONTINUE mode”.

While MDS is remote ON, it accepts controls from RS-232C only and does not accept followings:

- * Keys of main unit
- * Wireless remote control
- * Wired remote control
- * Parallel remote input
- * Relay playback/recording input

(Do not operate keys of main unit during remote ON to avoid malfunctions.)

While MDS is remote ON, INPUT switch and REC mode switch (E52 only) can be changed in main unit only. These switches cannot be changed by remote control.

While MDS is remote ON, output for the following operation can be done according to an alternation of inside condition:

- * Parallel remote
- * Relay playback/recording input

By sending off remote OFF command, MDS enters remote OFF mode.

5-3 Condition of MDS during remote OFF

When the power is turned on, MDS is in this mode.

While MDS is remote OFF, it accepts followings:

- * Keys of main unit
- * Wireless remote control
- * Wired remote control
- * Parallel remote input
- * Relay playback/recording input

As for the command from RS-232C, only remote ON command is acceptable. When MDS receives a command other than remote ON, it sends back a message means impossible execution.

5-4 Summary

To control MDS with RS-232C, it is necessary to send remote ON command after turning on the power to enter remote ON mode.

MDS does not accept an input other than the one from RS-232C during remote mode.

6 Transmission data

6.1 Structure of this section

In this section, details about each command are mentioned.

The commands are classified as function, data length, data, details of function and example of transmission packet.

Function: General functions of commands are shown.

Data length: Data length of commands are shown.

Data: A fixed data is shown in hexadecimal notation. As for a variable value, meaning and range of the value are explained.

Details of function: Explanation of the function of commands, notation for command use and etc. are mentioned.

Example of transmission packet:

Concrete examples of transmission packet are shown.

6.2 REMOTE MODE

Function: To set the remote mode

Data length: 2 bytes

Data: *10H*, Status

Status: *03H* = On

04H = Off

Details of function: This command changes remote mode of MDS.

As MDS does not accept controls from RS-232C when remote mode is not ON, it is necessary to use this command to enter remote ON mode.

When remote mode is OFF, if a packet other than the remote mode on is sent from PC, MDS sends back "CAN'T EXECUTE".

When MDS receives this command, it forcibly enters stop mode, REPEAT OFF or CONTINUE. In this condition, MDS accepts controls from RS-232C until it enters remote mode OFF.

In remote ON mode, MDS does not accept keys of main unit, wireless/wired remote control, parallel input or Relay Play/Rec.

On the other hand, parallel output and relay output are carried out.
Change of INPUT switch is acceptable even when remote mode is ON.
Refer also to section 5 about details of remote mode.

Example of transmission packet:

Set remote mode to ON.
7EH, 07H, 05H, 47H, 10H, 03H, FFH

6.3 POWER [for MDS-E11/E52 only]

Function: To set the power mode

Data length: 2 bytes

Data: *01H*, Status

Status: *02H* = On
03H = Off

Details of function: As well as the POWER button on the remote control, this command switches STANDBY mode and POWER ON mode.

When "POWER Off" command is send during toc reading, MDS is turned off after toc reading is completed.

However, "Power" comes back immediately from MDS.

When the power mode of MDS is actually changed, MDS sends off "STATUS DATA" automatically. "STATUS DATA" is reliable value to grasp the power condition accurately.

Example of transmission packet:

Set the power to ON.
7EH, 07H, 05H, 47H, 01H, 02H, FFH

6.4 PLAY

Function: To start playback.

Data length: 2 bytes

Data: *02H, 01H*

Details of function: This command starts playback.

When this command is sent in stop mode, MDS starts playback from top of a disc.

When this command is sent in playback pause mode, MDS starts playback again from the point.

When this command is sent in recording pause mode, MDS starts recording.

Example of transmission packet:

Start playback.

7EH, 07H, 05H, 47H, 02H, 01H, FFH

6.5 STOP

Function: To stop playback

Data length: 2 bytes

Data: *02H, 02H*

Details of function: This command stops playback.

When this command is sent in playback mode, MDS stops playback.

When playback is started again after the above, MDS starts playback from top of a disc.

To start playback again from the previous stopping point, "PAUSE ON/OFF" command must be used instead of this "STOP" command.

Example of transmission packet:

Stop playback.

7EH, 07H, 05H, 47H, 02H, 02H, FFH

6.6 PAUSE ON/OFF

Function: To pause playback/ To cancel pause

Data length: 2 bytes

Data: *02H, 03H*

Details of function: This command has the same function as the PAUSE key in the main unit or the remote control.

In short, this command changes playback mode to playback pause mode, and playback pause mode to playback mode.

It changes recording pause mode to recording mode, and recording mode to recording pause mode.

When this command is sent in stop mode, MDS enters playback pause mode at the top of a disc.

Example of transmission packet:

Start playback again in playback pause mode.

7EH, 07H, 05H, 47H, 02H, 03H, FFH

6.7 PAUSE ON

Function: To pause

Data length: 2 bytes

Data: *02H, 06H*

Details of function: This command changes playback and recording mode to pause mode.

Different from “PAUSE ON/OFF” command, this command does not cancel pause mode.

So, if this command is sent during playback pause mode, playback does not start.

The similar condition is applied to recording.

Example of transmission packet:

Pause playback during playback mode.

7EH, 07H, 05H, 47H, 02H, 06H, FFH

6.8 FF/REW OFF

Function: To cancel FF/REW

Data length: 1 byte

Data: *00H*

Details of function: This command stops FF or REW operations during each operations due to FF or REW command.

As FF or REW is the command to start operation of FF or REW, the operation will carried out to the end of a disc if only these commands

are given.

“Stop operation during FF or REW”, that is similar condition to the one of when FF or REW key in the main unit is released.

Example of transmission packet:

Stop FF during FF operation.

7EH, 06H, 05H, 47H, 00H, FFH

6.9 REW

Function: To start rewinding

Data length: 2 bytes

Data: *02H, 13H*

Details of function: This command has the same function when REW key in the main unit is pressed.

To stop REW, send “FF/REW OFF” command.

When this command is sent in playback pause mode, playback starting point goes back until “FF/REW OFF” command is given or starting point reaches to the top of the disc.

No sound is heard during this period.

When this command is sent in playback mode, as well as in playback pause mode, playback starting point goes back until “FF/REW OFF” command is given or starting point reaches to the top of the disc. Sound is heard in this case.

Example of transmission packet:

Start REW operation.

7EH, 07H, 05H, 47H, 02H, 13H, FFH

6.10 FF

Function: To start fast forward

Data length: 2 bytes

Data: *02H, 14H*

Details of function: This command has the same function when FF key in the main unit is

pressed.

To stop FF, send “FF/REW OFF” command.

When this command is sent in playback pause mode, playback starting point goes forward until “FF/REW OFF” command is given or starting point reaches to the end of the disc.

No sound is heard during this period.

When this command is sent in playback mode, as well as in playback pause mode, playback starting point goes forward until “FF/REW OFF” command is given or starting point reaches to the end of the disc. Sound is heard in this case.

Example of transmission packet:

Start FF operation.

7EH, 07H, 05H, 47H, 02H, 14H, FFH

6.11 PREV TRACK

Function: To skip back to a previous track

Data length: 2 bytes

Data: *02H, 15H*

Details of function: This command has the same function when AMS- key in the main unit is pressed.

When this command is sent in the top of a track in playback pause mode, playback starting point goes back to the top of the previous track, and playback pause mode is remained.

When this command is sent in the middle of a track in playback pause mode, starting point goes back to the top of the current track, and playback pause mode is remained.

When this command is sent during playback, playback starts from the top of the current track.

Example of transmission packet:

Start playback from the top of the current track.

7EH, 07H, 05H, 47H, 02H, 15H, FFH

6.12 NEXT TRACK

Function: To skip forward to the next track

Data length: 2 bytes

Data: *02H, 16H*

Details of function: This command has the same function when AMS+ key in the main unit is pressed.

When this command is sent during playback, playback starts from the next track.

When this command is sent in playback pause mode, starting point goes forward to the top of the next track, and playback pause mode is remained.

Example of transmission packet:

Start playback from the top of the next track.

7EH, 07H, 05H, 47H, 02H, 16H, FFH

6.13 REC

Function: To prepare for recording

Data length: 2 bytes

Data: *02H, 21H*

Details of function: This command has the same function when REC button in the main unit is pressed.

When this command is sent during playback, playback starts from the next track.

When this command is sent in playback pause mode, starting point goes forward to the top of the next track, and playback pause mode is remained.

When this command is sent during recording, track marking is carried out and a track is added.

When the INPUT SELECT switch in the main unit is set to DIGITAL, first check by "STATUS" data from MDS whether copy is possible and whether input is locked before recording.

When the INPUT SELECT switch in the main unit is set to DIGITAL, data is Din unlock just after stop mode has changed to recording pause

mode, because it does not synchronized with input signals.

When digital input is correct, it synchronizes with input signals in 200 mSec at latest. So, first send "REC" command, and send "STATUS" command after 200 mSec to check whether input is locked, then start recording.

Example of transmission packet:

Enter recording pause mode to start recording.

7EH, 07H, 05H, 47H, 02H, 21H, FFH

6.14 TIME MACHINE REC

Function: To start time machine recording

Data length: 2 bytes

Data: *02H, 28H*

Details of function: This command has the same function when T.REC key in the remote control is pressed.

When this command is sent in recording pause mode, recording starts from the point before 6 seconds at most within the input sounds.

In time machine recording, as only the sounds after the unit enters recording pause mode can be recording, when this command is sent in 6 seconds, recording starting point goes back in time of less than 6 seconds.

When this command is sent in recording pause mode, "IMPOSSIBLE" is sent back instead of "REC".

As "STATUS" is correctly in REC, refer to the value of "STATUS" to check whether time machine recording has started or not.

Example of transmission packet:

Start time machine recording from recording pause mode.

7EH, 07H, 05H, 47H, 02H, 28H, FFH

6.15 EJECT

Function: To eject a disc

Data length: 2 bytes

Data: *02H, 40H*

Details of function: This command has the same function when EJECT key in the main unit is pressed.

When this command is send with a disc inside, the disc will be ejected.

Example of transmission packet:

Eject a disc.

7EH, 07H, 05H, 47H, 02H, 40H, FFH

6.16 AUTO PAUSE

Function: To set AUTO PAUSE

Data length: 2 bytes

Data: 02H, Status

Status: *81H* = On

80H = Off

Details of function: This is the command to switch AUTO PAUSE to ON or OFF.

AUTO PAUSE is the function to pause playback automatically in the end of each track.

When this command is sent, MDS switches AUTO PAUSE to ON or OFF according to the value of status.

Example of transmission packet:

Set AUTO PAUSE to ON.

7EH, 07H, 05H, 47H, 02H, 81H, FFH

6.17 TRACK PLAY

Function: To start playback from the specified track

Data length: 4 bytes

Data: *03H, 42H, 01H*, Track No.

Track No.: 1 (*01H*) to 255 (*FFH*)

Details of function: This is the command to start playback from the specified track by entering the track number.

Example of transmission packet:

Start playback from the 16th track.

7EH, 09H, 05H, 47H, 03H, 42H, 01H, 10H, FFH

6.18 TRACK PAUSE

Function: To pause playback in the specified track

Data length: 4 bytes

Data: *03H, 43H, 01H*, Track No.

Track No.: 1(*01H*) - 255(*FFH*)

Details of function: This is the command to pause playback at the top of the specified track by entering the track number.

Example of transmission packet:

Pause playback at the top of the 18th track.

7EH, 09H, 05H, 47H, 03H, 43H, 01H, 12H, FFH

6.19 ELAPSED TIME

Function: To set to send out elapsed time

Data length: 2 bytes

Data: *07H*, Status

Status: *10H* = On

11H = Off

Details of function: This is the command to set whether elapsed time displayed in MDS will be sent out or not.

MDS can send out the new time data whenever the time is renewed.

By send out this command with the value of Status On, elapsed time of playback, FF, REW and recording are shown in sequence.

MDS sends out only the elapsed times. To display remain time, first check the time of whole track by "TRACK TIME REQ" command and then subtract the elapsed time from the time of whole track.

The elapsed time cannot be sent out just after remote mode is set to ON.

Example of transmission packet:

Send out the elapsed time.

7EH, 07H, 05H, 47H, 07H, 10H, FFH

6.20 DIVIDE MODE REQ

Function: To enter track divide rehearsal.

Data length: 2 bytes

Data: *0AH, 01H*

Details of function: This is the command to enter the rehearsal of track divide.

When this command is sent in playback or playback pause mode, MDS enters the rehearsal of track divide, in which the playback point where the command is received is to be divide point.

When entering the rehearsal of track divide, playback is carried out for several seconds repeatedly from the point to be divided.

The point to be divided can be moved forward or backward by “DIVIDE ADJUST” command.

If it is the desired point to be divided, divide the track by “DIVIDE REQ” command.

Example of transmission packet:

Enter the track divide mode.

7EH, 07H, 05H, 47H, 0AH, 01H, FFH

6.21 DIVIDE ADJUST

Function: To adjust the point to be divided.

Data length: 4 bytes

Data: *0AH, 02H, 08H, Position*

Position: *-128(80H) to +127(7FH)*

Details of function: This command adjust the point to be divided.

When this command is sent during track divide rehearsal by “DIVIDE MODE REQ”, MDS changes the point to be divided to where is given by Position.

Position occupies the value from *-128(80H) to +127(7FH)*.

This command must be sent during track divide rehearsal by “DIVIDE MODE REQ”.

If it is sent during other than track divide rehearsal, sometimes it may cause malfunction.

MDS sends out "DIVIDE POINT DATA" one by one whenever the value changes even when the point to be divided is changed much at once.

As another command cannot be accepted until the value is renewed to a specified one completely, first check if "DIVIDE POINT DATA"s of change times are sent or not, then send the next command.

Track cannot be divided just after beginning and before ending of the track.

Therefore, sometimes the Position value does not change up to the specified value if the absolute value of it is large. In this case, "DIVIDE POINT DATA"s of actual change times are sent.

Example of transmission packet:

Move the point to be divided to the two frames back.
7EH, 09H, 05H, 47H, 0AH, 02H, 08H, FEH, FFH

6.22 DIVIDE REQ

Function: To carry out track divide.

Data length: 2 bytes

Data: *0AH, 02H*

Details of function: This command carries out track divide.

When this command is sent during track divide rehearsal by "DIVIDE MODE REQ" command, MDS divide the track at the point planned to be divided.

This command must be sent during track divide rehearsal by "DIVIDE MODE REQ".

If it is sent during other than track divide rehearsal, sometimes it may cause malfunction.

The point to be divided can be moved forward or backward by "DIVIDE ADJUST" command.

Example of transmission packet:

Divide a track at the point planned to be divided.
7EH, 07H, 05H, 47H, 0AH, 02H, FFH

6.23-a COMBINE MODE REQ [for MDS-E11/E52]

Function: To enter track combine rehearsal.

Data length: 3 bytes

Data: *0AH, 06H*, Track

Track: *2(02H)* to *255(FFH)* [the latter of the combined track]

Details of function: This is the command to enter rehearsal of combining tracks side by side.

When this command is sent in stop mode, MDS plays back for several seconds of top of the specified track and of the end of the previous track repeatedly.

If it is the desired point to be combined, combine these tracks by “COMBINE REQ” command.

Example of transmission packet:

Enter combine rehearsal of the 2nd and 3rd tracks.

7EH, 08H, 05H, 47H, 0AH, 06H, 03H, FFH

6.23-b COMBINE MODE REQ [for MDS-E12]

Function: To enter track combine rehearsal.

Data length: 4 bytes

Data: *0AH, 09H*, Track A#, Track B#

Track A#: *1(01H)* to *255(FFH)* [the former track in combine]

Track B#: *1(01H)* to *255(FFH)* [the latter track in combine]

(Caution: If the same numbers are specified in Track A# and Track B#, it may cause malfunction. Please specify a different track number in each.)

Details of function: This is the command to enter rehearsal of combining tracks.

When this command is sent in stop mode, MDS plays back for several seconds of end of the track specified for A# and of the top of the track specified for B# repeatedly.

If they are desired tracks to be combined, combine these tracks by “COMBINE REQ” command.

This command can function for tracks are not side by side.

Example of transmission packet:

Enter combine rehearsal of the 2nd track and 12th one.

7EH, 09H, 05H, 47H, 0AH, 09H, 02H, 0CH, FFH

6.24-a COMBINE REQ [for MDS-E11/E52]

Function: To carry out track combine

Data length: 3 bytes

Data: *0AH, 07H*, Track

Track: 3(*02H*) to 255(*FFH*) [the latter of the combined track + 1]

Details of function: This is the command to combine tracks side by side.

When this command is sent while combine rehearsal is being carried out by "COMBINE MODE REQ" command, MDS combines two tracks just before the specified one.

This command must be sent during combine rehearsal by "COMBINE MODE REQ".

If it is sent during other than combine rehearsal, sometimes it may cause malfunction.

The track to be specified by this command must be the same as the track specified by "COMBINE MODE REQ" command + 1.

If the track specified by "COMBINE MODE REQ" command is different from the track specified by "COMBINE REQ" command - 1, sometimes it may cause malfunction.

Example of transmission packet:

Carry out combine during combine rehearsal of the 2nd and 3rd tracks.

7EH, 08H, 05H, 47H, 0AH, 07H, 04H, FFH

6.24-b COMBINE REQ [for MDS-E12]

Function: To carry out track combine

Data length: 4 bytes

Data: *0AH, 0AH*, Track A#, Track B#

Track A#: 1(*01H*) to 255(*FFH*) [the former track number in combine]

Track B#: 1(*01H*) to 255(*FFH*) [the latter track number in combine]

(Caution: If the same numbers are specified in Track A# and Track B#, it may cause malfunction. Please specify a different track number in each.)

Details of function: This is the command to complete combining tracks from rehearsal.
When this command is sent while combine rehearsal is being carried out by "COMBINE MODE REQ" command, MDS will complete combining two tracks.

This command must be sent during combine rehearsal by "COMBINE MODE REQ". If it is sent during other than combine rehearsal, sometimes it may cause malfunction.

This command can function for tracks are not side by side.

Example of transmission packet:

Carry out combine during combine rehearsal of the 2nd track and 12th one.

7EH, 08H, 05H, 47H, 0AH, 0AH, 02H, 0CH, FFH

6.25 EDIT MODE CANCEL

Function: To stop rehearsal

Data length: 2 bytes

Data: *0AH, 03H*

Details of function: This is the command to stop divide/combine rehearsal.

When this command is sent during rehearsal of "DIVIDE MODE REQ" or "COMBINE MODE REQ" command, rehearsal is stopped and playback restarts from the point rehearsal has being carried out.

This command must be sent during rehearsal.

If it is sent during other than rehearsal, sometimes it may cause malfunction.

Example of transmission packet:

Stop track divide rehearsal.

7EH, 07H, 05H, 47H, 0AH, 03H, FFH

6.26 ERASE REQ

Function: To erase track

Data length: 3 bytes

Data: *0AH, 04H*, Track
Track: *0(00H)* to *255(FFH)*

Details of function: This is the command to erase the track specified by "Track".

When this command is sent in stop mode, MDS erases the track specified by "Track" and the tracks after it are decreased by a number for each.

When 0 is specified for "Track", all tracks are erased.

Therefore, to erase plural number of tracks, it is recommended to erase from the track with the largest number.

This command must be sent in stop mode.

As track numbers will be decreased, if the command is sent other than in stop mode, sometimes it may cause malfunction such that MDS sends out an incorrect track number.

Example of transmission packet:

Erase the 2nd track.

7EH, 08H, 05H, 47H, 0AH, 04H, 02H, FFH

6.27 MOVE REQ

Function: To move track

Data length: 4 bytes

Data: *0AH, 05H*, Track From, Track To
Track From:
Track To:
1(01H) to *255(FFH)*

Details of function: This is the command to move a track specified by "Track".

When this command is sent in stop mode, MDS moves the track specified by "Track From" to the one specified by "Track To".

For example, in the disc containing tracks as follows;

1 Tr:ABC
2 Tr:DEF
3 Tr:GHI
4 Tr:JKL
5 Tr:MNO
:
:

if 2 is specified to Track From and 4 to Track To, tracks' order changes as follows:

1 Tr:ABC
2 Tr:GHI
3 Tr:JKL
4 Tr:DEF
5 Tr:MNO
:
:

This command must be sent in stop mode.

As track numbers after the track between Track From and Track To will be decreased, if the command is sent other than in stop mode, sometimes it may cause malfunction such that MDS sends out an incorrect track number.

Example of transmission packet:

Move the 2nd track to the 4th track.

7EH, 09H, 05H, 47H, 0AH, 05H, 02H, 04H, FFH

6.28 UNDO REQ

Function: To cancel edit operation just before the current operation.

Data length: 2 bytes

Data: *0AH, 11H*

Details of function: This is the command to cancel edit which has been carried out just before the current operation.

When this command is sent in stop mode after "ERASE", "DIVIDE", "COMBINE", "MOVE" or "NAME IN" has been carried out, MDS restores the condition just before the edit operation.

If one of the following operation is carried out after edit operation, cancel will be impossible by this command:

- * Enter recording pause mode or recording mode.
- * Eject a disc.
- * Turn off the power.

This command must be sent in stop mode.

If the command is sent other than in stop mode, sometimes it may

cause malfunction such that MDS sends out an incorrect track number.

Example of transmission packet:

Cancel edit operation just before the current operation.
7EH, 07H, 05H, 47H, 0AH, 11H, FFH

6.29 MODEL REQUEST

Function: To check model information.

Data length: 2 bytes

Data: *02H, 10H*

Details of function: Information about recording function of MDS can be shown by this command.

Example of transmission packet:

Check model information.
7EH, 07H, 05H, 47H, 20H, 10H, FFH

6.30 STATUS REQ

Function: To check the condition of mecha deck.

Data length: 2 bytes

Data: *20H, 20H*

Details of function: This is the command to make MDS send out "STATUS DATA" indicating current mecha deck condition.

When this command is sent, MDS sends out "STATUS DATA".

"STATUS DATA" contains information such as exist/no exist of disc, the value of REPEAT MODE, the value of PLAY MODE and so on.

Example of transmission packet:

Make MDS send out "STATUS DATA".
7EH, 07H, 05H, 47H, 20H, 20H, FFH

6.31 DISC DATA REQ

Function: To check disc information.

Data length: 2 bytes

Data: *20H, 21H*

Details of function: This is the command to make MDS send out "DISC DATA" indicating disc information.

When this command is sent, MDS sends out "DISC DATA".

"DISC DATA" contains information such as exist/no exist of disc error, that recording is protected or not, and so on.

Example of transmission packet:

Make MDS send out "DISC DATA".

7EH, 07H, 05H, 47H, 20H, 21H, FFH

6.32 MODEL NAME REQ

Function: Check model name

Data length: 2 bytes

Data: *20H, 22H*

Details of function: This is the command to send "MODEL NAME", model name data of MDS, to MDS.

When this command is sent, MDS transmits "MODEL NAME". "MODEL NAME" includes model name of MDS as ASCII data.

Example of transmission packet:

Send out "MODEL NAME" to MDS.

7EH, 07H, 05H, 47H, 20H, 22H, FFH

6.33 REC DATE REQ

Function: Check date and time of recording

Data length: 3 bytes

Data: *20H, 24H, Track*

Track: *1(01H) to 255(FFH)*

Details of function: This is the command to send out "REC DATE DATA", information of the last editing date and time recorded in every track of disc.

Disc has an area to record the last editing or recording date and time

on every track.

“REC DATE DATA” includes information of that area as well and this is the command to output it.

In this data area, models without a built-in clock are designed to record 0 all the time.

As MDS-E11/52 does not have a built-in clock, “REC DATE DATA” of track recorded or edited using MDS-E11/52 always outputs 0 data.

Example of transmission packet:

Check the last updated date and time of editing/recording on the first track.

7EH, 08H, 05H, 47H, 20H, 24H, 01H, FFH

6.34 TOC DATA REQ

Function: Check TOC information

Data length: 3 bytes

Data: *20H, 44H, 01H*

Details of function: This is the command to send out “TOC DATA”, information of total track numbers and recorded time of disc, to MDS.

Examples of transmission packet:

Send out “TOC DATA”

7EH, 08H, 05H, 47H, 20H, 44H, 01H, FFH

6.35 TRACK NO. TIME REQ

Function: Check the time length of the specified track.

Data length: 4 bytes

Data: *20H, 45H, 01H*, Track No.

Track: *1(01H)* to *255(FFH)*

Details of function: This is the command to send out “TRACK TIME DATA”, information of track time, to MDS.

Example of transmission packet:

Send out the time of the 3rd track.

7EH, 09H, 05H, 47H, 20H, 45H, 01H, 03H, FFH

6.36 DISC NAME REQ

Function: Check disc name

Data length: 3 bytes

Data: *20H, 48H, 01H*

Details of function: This is the command to send out "DISC NAME", disc name information, to MDS.

If the number of characters of disc name is 16 or more, MDS divides name data into some packets every 16 characters.

The figure 00h in name data represents that it is the last data.

Example of transmission packet:

Send out disc name "DISC NAME" to MDS.

7EH, 08H, 05H, 47H, 20H, 48H, 01H, FFH

6.37 TRACK NO. NAME REQ

Function: Check track name.

Data length: 3 bytes

Data: *20H, 4AH*, Track No.

Track: 1(*01H*) to 255(*FFH*)

Details of function: This is the command to send out "TRACK NAME", information of the track name, to MDS.

If the number of characters of track name is 16 or more, MDS divides name data into some packets every 16 characters.

The figure 00h in name data Indicates that it is the last data.

Example of transmission packet:

Send out "TRACK NAME" of the 2nd track.

7EH, 08H, 05H, 47H, 20H, 4AH, 02H, FFH

6.38 ALL NAME REQ

Function: Check all name of discs and tracks.

Data length: 3 bytes

Data: *20H, 4CH, 01H*

Details of function: This is the command to send out information of disc name, "DISC NAME" and each track name "TRACK NAME" to MDS.

When this command is sent, MDS first sends out "DISC NAME" in the same way as it receives "DISC NAME REQ" and next it sends out "TRACK NAME" as it receives "TRACK NAME REQ" for the same times as existing number of tracks on disc.

MDS sends out "ALL NAME END" after it sends out all track names of existing tracks.

MDS will send data for a long time at this command if the disc has many disc names and track names. Use "NAME CANCEL" command if you want to stop sending data from MDS.

Example of transmission packet:

Send all disc and track names to MDS.

7EH, 08H, 05H, 47H, 20H, 4CH, 01H, FFH

6.39 NAME CANCEL

Function: Cancels "ALL NAME REQ".

Data length: 2 bytes

Data: *20H, 01H*

Details of function : This is the command to MDS to suspend sending disc and track names.

MDS will send data for a long time at "ALL NAME REQ" command if the disc has many disc names and track names. Use "NAME CANCEL" command if you want to stop sending data from MDS.

When MDS receives this command during sending track name data, it stops sending after finishing to send the current track name data and does not send the following name data. Therefore, it will take some time until MDS stops sending data if this command is sent in the middle of sending extremely long track.

Example of transmission packet:

Cancel "ALL NAME REQ".

7EH, 07H, 05H, 47H, 20H, 01H, FFH

6.40 REC REMAIN REQ

Function: Check remaining recording time.

Data length: 3 bytes

Data: *20H, 54H, 01H*

Details of function: This is the command to send "REC REMAIN DATA", recordable remain time information of the current disc, to MDS.

When this command is sent in the stop mode, MDS sends "REC REMAIN REQ", recordable remain time information of the current disc.

MDS returns collect value only when disc is recordable and TOC on the disc has been read and in the stop mode.

Example of transmission packet:

Check remain time for recording.

7EH, 08H, 05H, 47H, 20H, 54H, 01H, FFH

6.41 NAME REMAIN REQ

Function: Check remaining inputtable name of the disc.

Data length: 4 bytes

Data: *20H, 55H, 00H, Track No.*

Track: *0(00H) to 255(FFH)*

Details of function: This is the command to send out "NAME REMAIN REQ", the information of remaining inputtable name of the current disc, to MDS.

At this command in the stop mode, MDS sends out the maximum number of inputtable characters when you change the name of specified track or disc.

This means, it sends out the quantity of name area + unused area which the specified track number reserves.

In case of specifying the track number as *0(00H)*, it sends out the quantity of name area + unused area of the disc.

Example of transmission packet:

Check the number of remaining inputtable characters when the name of the first track is changed.

7EH, 09H, 05H, 47H, 20H, 55H, 00H, 01H, FFH

6.42 DISC NAME WRITE

Function: Write name in disc.

Data length: Maximum 19 bytes

Data: The first packet: *20H, 70H, 01H, NameData*

(Maximum 16 bytes, the last data is 00H.)

Packets after the second packet: 20H, 71H, PacketNo, NameData
(Maximum 16 bytes, the last data is 00H.)

PacketNo: 2(02H) to 255(FFH)

NameData: ASCII code of the character to input.

0(00H), ' '(20H) to 'Z'(5AH), '^'(5EH) to 'z'(7AH)

Details of function: This is the command to input disc name.

When this command is sent in the stop mode, MDS registers NameData on the current disc name.

At this command, maximum only 16 characters are sent per one packet. Therefore, if 16 or more characters are input, the remaining characters are sent by the second or following packets.

After sending packets, MDS sends "WRITE PACKET RECEIVED" message. So, send next packet after receiving it.

NameData is recordable up to 16 characters, but in case that the number of characters is less than 16, data can be completed by inputting 0(00H) to NameData.

If the number of input characters is integral multiple of 16, data must be completed by sending packet filled with only 0(00H) to NameData to make sure it is the last data.

Example of transmission packet:

Write name 'MDS-E12 Mini Disc Recorder' in disc.

7EH, 18H, 05H, 47H, 20H, 70H, 01H, 4DH, 44H, 53H, 2DH, 45H,
31H, 32H, D0H, C6H, C3H, DEH, A8H, BDH, B8H, DAH, BAH, FFH

Wait for 'WRITE PACKET RECIEVED'

7EH, 0DH, 05H, 47H, 20H, 71H, 02H, 2DH, C0H, DEH, 2DH, 00H,
FFH

6.43 TRACK NO. NAME WRITE

Function: Write name to the specified track.

Data length: Maximum 19 bytes

Data: The first packet: 20H, 72H, TrackNo, NameData

(Maximum 16 bytes, the last data is 00H.)

Packets after the second packet: 20H, 73H, PacketNo, NameData
(Maximum 16 bytes, the last data is 00H.)

TrackNo: 1(01H) to 255(FFH)

PacketNo: 2(00H) to 255(FFH)

NameData: ASCII code of the character to input.

0(00H), '(20H) to 'Z'(5AH), '^'(5EH) to 'z'(7AH)

Details of function: This is the command to input disc name.

When this command is sent in the stop mode, MDS registers NameData in the specified track.

At this command, maximum only 16 characters are sent per one packet. Therefore, if 16 or more characters are input, the remaining characters are sent by the second or following packets.

After sending packets, MDS sends 'WRITE PACKET RECEIVED' message. So, send the next packet after receiving it.

NameData is recordable up to 16 characters, but in case that the number of characters is less than 16, data can be completed by inputting 0(00H) to NameData.

If the number of input characters is integral multiple of 16, data must be completed by sending packet filled with only 0(00H) to NameData to make sure it is the last data.

Example of transmission packet:

Write name 'MDS-E11 Mini Disc Recorder' in 2nd track.

7EH, 18H, 05H, 47H, 20H, 72H, 02H, 4DH, 44H, 53H, 2DH, 45H,
31H, 31H, D0H, C6H, C3H, DEH, A8H, BDH, B8H, DAH, BAH, FFH

Wait for 'WRITE COMPLETE'

7EH, 0DH, 05H, 47H, 20H, 73H, 02H, 2DH, C0H, DEH, 2DH, 00H,
FFH

7 Transmission data

7.1 Structure of this section

This section will provide detail descriptions about each receive data.

Each receive data's explanation is composed of items including Function, Data length, Data, Details of function and Example of receive packet.

Function: General function of receive data.

Data length: Data length of receiving data.

Data: Fixed data uses hexadecimal notation. For the varying values, description of their meaning and range they vary will be provided. If variables have significance every bit, LSB and MSB are described as b0, b7, respectively.

Details of function: Detail explanation on the receive data and precautions to use it.

Example of receive packet:

Gives concrete examples of receive packet.

7.2 REMOTE MODE

Function: The status of remote mode.

Data length: 2 bytes

Data: *10H*, Status
Status: *03H*=On
04H=Off

Details of function: Indicates REMOTE MODE status.

MDS outputs this data when it receives "REMOTE MODE" and the status is changed.

Example of receive packet:

Remote mode turned to ON.
6FH, 07H, 05H, 47H, 10H, 03H, FFH

7.3 POWER

Function: Set Power status.

Data length: 2 bytes

Data: *01H*, Status
Status: *02H*=On
03H=Off

Details of function: Indicates Power status.

MDS outputs this data when it receives "POWER" and the status changes.

Also, MDS outputs "STATUS DATA" when the status of Power changes.

Example of receive packet:

Remote mode turns to ON.
6FH, 07H, 05H, 47H, 10H, 03H, FFH

7.4 PLAY

Function: Started playback.

Data length: 2 bytes

Data: *02H, 01H*

Details of function: Indicates playing status.

Example of receive packet:

Start playing.
6FH, 07H, 05H, 47H, 02H, 01H, FFH

7.5 STOP

Function: Operation has stopped.

Data length: 2 bytes

Data: *02H, 02H*

Details of function: This command indicates operation has stopped by "STOP".

When MDS enters stop mode by receiving "STOP", it outputs this data.

In stop mode, MDS also outputs "STATUS DATA".

When MDS has automatically stopped after playing a disc to its end, it does not output "STOP" but outputs "STATUS DATA".

Example of receive packet:

Operation has stopped.
6FH, 07H, 05H, 47H, 02H, 02H, FFH

7.6 PAUSE

Function: Playback has paused.

Data length: 2 bytes

Data: *02H, 03H*

Details of function: This command indicates playback has paused.

When MDS enters playback pause mode by receiving "PAUSE ON/OFF", "PAUSE ON" or "TRACK PAUSE", it outputs this data.

In playback pause mode, MDS also outputs "STATUS DATA".

Example of receive packet:

Playback has paused.
6FH, 07H, 05H, 47H, 02H, 03H, FFH

7.7 REC

Function: Started recording.

Data length: 2 bytes

Data: *02H, 21H*

Details of function: Indicates MDS started recording.

MDS outputs this data when it receives "PAUSE ON/OFF" and "PLAY" in the recording pause mode and starts record.

Also, MDS outputs "STATUS DATA" when it starts recording.

Furthermore, MDS increases one track number when it receives "REC" in the recording mode. At this time, it outputs this data as well.

Example of receive packet:

Started recording.
6FH, 07H, 05H, 47H, 02H, 21H, FFH

7.8 REC PAUSE

Function: Entered recording pause mode.

Data length: 2 bytes

Data: *02H, 25H*

Details of function: Indicates that MDS entered recording pause mode.

When MDS receives "REC" in the recording pause mode or receives "PAUSE ON/OFF" or "PAUSE ON" in the recording mode, it enters recording pause mode and outputs this data.

Also, MDS outputs "STATUS DATA" when it enters recording pause mode.

Example of receive packet :

Entered record pause state.

6FH, 07H, 05H, 47H, 02H, 25H, FFH

7.9 EJECT

Function: Ejected disc.

Data length: 2 bytes

Data: *02H, 40H*

Details of function: Indicates MDS ejected a disc.

MDS ejects a disc when it receives "EJECT" and it outputs this data.

Also, MDS outputs "STATUS DATA" when it ejects a disc.

Example of receive packet:

Enters record pause state.

6FH, 07H, 05H, 47H, 02H, 25H, FFH

7.10 MODEL DATA

Function: Model record information.

Data length: 2 bytes

Data: *20H, 61H, Feature*

Feature: b7 to b2: 000000 fix
b1: time machine REC
0: impossible
1: possible
b0: Recording function
0: n/a
1: equip

Details of Function: Information on MDS's recording function.
When it receives "MODEL REQUEST" command, MDS outputs this data.
MDS-E12/11/52's Feature byte returns *03H* at all times.

Example of receive packet:

Gains MODEL information.
6FH, 09H, 05H, 47H, 20H, 10H, 01H, 03H, FFH

7.11 STATUS DATA

Function: Internal status

Data length: 7 bytes

Data: *20H, 20H, Data1, Data2, Data3, 01H, TrackNo.*

Data1: b7, b6

00 Fix

:b5

1: Disc exist

0: No disc

:b4

1: Power Off

0: Power On

:b3, b2, b1, b0

0000: STOP

0001: PLAY

0010: PAUSE

0011: EJECT

0100: REC PLAY

0101: REC PAUSE

0110: rehearsal

0111 to 1110: reserved

1111: not available to play

Data2:

:b7

0: TOC read not yet

1: TOC read done

:b6

0 Fix

:b5

0: REC impossible

1: REC possible

:b4b3b2b1b0

00000 Fix

Data3:

:b7

0: Stereo

1: Mono

:b6

0: COPY possible

1: COPY impossible

:b5

0: Din Lock

1: Din unlock

:b4b3

00 Fix

:b2b1b0

001: Analog

011: Optical (Only E52)

101: Coaxial

000, 010, 100, 010, 110 ⌀ Reserved

TrackNo: 1(01H) to 255(FFH)

Details of function: Indicates MDS' internal state.

When MDS receives "STATUS REQ", it outputs this data.

Also, when the lower 4 bit of Data1 changes, MDS outputs this data.

When INPUT SELECT switch on the unit is in DIGITAL mode, check if it is copiable or not in the recording pause mode and also input is locked before start recording.

It is only in the recording mode that copiable bit and lock bit take significant value in the mode of record pause.

When INPUT SELECT switch on the unit is in DIGITAL mode, data enters Din unlock state since digital data is not synchronized with input signal immediately right after MDS entered the recording pause mode from the stop mode.

If digital input is done correctly, digital data is synchronized with input signal in 200mSec at the latest. So send "STATUS REQ" command in 200mSec after sending "REC" command and check if input is locked. Then start recording.

Example of receive packet:

Internal statement at the start of playback.

6FH, 0CH, 05H, 47H, 20H, 20H, 01H, A0H, 01H, 01H, 00H, FFH

7.12 DISC DATA

Function: Disc information

Data length: 7 bytes

Data: *20H, 21H, 00H, DiscData, 00H, 00H, 00H*

DiscData:

:b7 to b4

0000 Fix

:b3

0: No error

1: Disc error

:b2

0: No Protect

1: Protected

:b1b0

00: reserved

01: Recordable

10: Pre Master

11: reserved

Details of function: Indicates various information on disc.

MDS outputs this data when it receives "DISC DATA".

Example of receive packet:

Disc information of the recordable disc with no error and no protect.

6FH, 0CH, 05H, 47H, 20H, 21H, 00H, 01H, 00H, 00H, 00H, FFH

7.13 MODEL NAME

Function: Model name information.

Data length: 16 bytes

Data: 20H, 22H, ModelName (14 bytes, remain data is filled with 00H.)

Details of function: Outputs model name using ASCII character string.

Example of receive packet: MDS-E12

6FH, 15FH, 05H, 47H, 20H, 22H, 4FH, 44H, 53H, 2DH,
45H, 31H, 32H, 00H, 00H, 00H, 00H, 00H, FFH

7.14 REC DATE DATA

Function: Information of record date data

Data length: 9 bytes

Data: 20H, 24H, TrackNo, Year, Month, Day, Hour, Min, Sec
TrackNo: 1(01H) to 255(FFH)
Year: 0(00H) to 99(63H)the last two figures of the year.
Month: 1(00H) to 12(0CH)month
Day: 1(00H) to 31(1FH)day
Hour: 0(00H) to 24(18H)hour
Min: 0(00H) to 60(3CH)min
Sec: 0(00H) to 60(3CH)sec

Details of function: MDS outputs the latest date and time when the specified track is recorded or edited.

The last updated date and time of each track is recorded on disc. Models without a built-in clock are designed to record 0 data all the time in stead of recording the last updated date and time.

As MDS-E11/52 does not equip built-in clock, REC DATE DATA reads out all 0 data for the track recorded or edited with MDS-E11/52.

REC DATE DATA displays the correct digits if the disc is recorded with a model equipping a built-in clock and the last updated date and time is recorded.

Example of receive packet:

The last updated date and time of the first track on the disc recorded by MDS-E12 is on Feb. 3rd in 2001 and 12:34:56.

6FH, 0EH, 05H, 47H, 20H, 24H, 01H, 01H, 02H, 03H, 0CH, 22H, 38H, FFH

7.15 DISC NAME

Function: Disc name information

Data length: Maximum 19 bytes

Data: The first packet: *20H, 48H, 01H*, NameData (16 bytes, the remain data is filled with *00H*.)

Packets after the second packet: *20H, 49H*, PacketNo, NameData (16 bytes, the remain data is filled with *00H*.)

PacketNo: *2(00H)* to *255(FFH)*

NameData: ASCII code of the character of the disc name.

0(00H), *' '(20H)* to *'Z'(5AH)*, *'^(5EH)* to *'z'(7AH)*

Details of function: Outputs disc name recorded on disc.

MDS outputs data that it received "DISC NAME REQ" command when it received that command in stop mode.

Only maximum 16 characters are to be sent per one packet at this data. Therefore, if 16 or more characters are recorded, MDS sends data by dividing into some packets.

NameData is recordable up to 16 characters and in case that the number of characters is less than 16, *0(00H)* fills NameData.

Example of receive packet:

The disc name of the disc named "MDS-E12 minidisc recorder".

6FH, 18H, 05H, 47H, 20H, 48H, 01H, 4DH, 44H, 53H, 2DH, 45H, 31H, 32H, D0H, C6H, C3H, DEH, A8H, BDH, B8H, DAH, BAH, FFH

6FH, 18H, 05H, 47H, 20H, 49H, 02H, 2DH, C0H, DEH, 2DH, 00H, 00H, 00H, 00H, 00H, 00H, 00H, 00H, 00H, 00H, 00H, FFH

7.16 TRACK NAME

Function: Track name information

Data length: Maximum 19 bytes

Data: The first packet: *20H, 4AH*, PacketNo, NameData (16 bytes, the remaining data is filled with *00H*.)

The packets after the second packet:

20H, 4BH, PacketNo, NameData (16 bytes, the remaining data is filled with *00H*.)

TrackNo: 1(00H) to 255(FFH)
PacketNo: 2(00H) to 255(FFH)
NameData: ASCII code of the character of the disc name.
0(00H), ' '(20H) to 'Z'(5AH), '^'(5EH) to 'z'(7AH)

Details of function: Outputs track name recorded on disc.

MDS outputs this data when it received a "TRACK NAME REQ" command in the stop mode.

Only maximum 16 characters are to be sent per one packet in this data. Therefore, if 16 or more characters are recorded, MDS sends data by dividing into some packets.

NameData is up to 16 characters and in case that the number of characters is less than 16, 0(00H) fills NameData.

Example of receive packet:

The track name of the first track named "MDS-E12 minidisc recorder".
6FH, 18H, 05H, 47H, 20H, 4AH, 01H, 4DH, 44H, 53H, 2DH, 45H, 31H,
32H, D0H, C6H, C3H, DEH, A8H, BDH, B8H, DAH, BAH, FFH

6FH, 18H, 05H, 47H, 20H, 4BH, 02H, 2DH, C0H, DEH, 2DH, 00H,
00H, 00H, 00H, 00H, 00H, 00H, 00H, 00H, 00H, 00H, 00H, FFH

7.17 ALL NAME END

Function: Ends disc/track name output.

Data length: 2 bytes

Data: 20H, 4CH

Details of function: When MDS received "ALL NAME REQ" command, it outputs this data after it sent all track names.

Example of receive packet:

Completed output of all track names responding to "ALL NAME REQ" command.

6FH, 07H, 05H, 47H, 20H, 4CH, FFH

7.18 ELAPSED TIME

Function: Elapsed time in playback mode.

Data length: 6 bytes

Data: 20H, 51H, TrackNo, 01H, Min, Sec
TrackNo: 1(01H) to 255(FFH)
Min: 0(00H) to 60(3CH)min
Sec: 0(00H) to 60(3CH)sec

Details of function: When "ELAPSED TIME" commands MDS to send elapsed time, MDS outputs this data each time elapsed time varies in playback mode or in FF, REW in the middle of playback mode.

Example of receive packet:

The first track playbacks 0 minute and 2 seconds.
6FH, 0BH, 05H, 47H, 20H, 51H, 01H, 01H, 00H, 02H, FFH

7.19 REC REMAIN

Function: Information about remaining time for recording.

Data length: 5 bytes

Data: 20H, 54H, 01H, Min, Sec
Min: 0(00H) to 60(3CH)min
Sec: 0(00H) to 60(3CH)sec

Details of function: MDS received a "REC REMAIN REQ" command outputs the recordable remain time information of the current disc.

Example of receive packet:

Recordable remaining time is 74 minutes and 43 seconds.
6FH, 0AH, 05H, 47H, 20H, 54H, 01H, 4AH, 2BH, FFH

7.20 NAME REMAIN

Function: Information about the remaining name data of the disc.

Data length: 6 bytes

Data: 20H, 55H, 00H, Track, RemainH, RemainL
Track: 0(00H) to 255(FFH)
RemainH: 0(00H) to 28(1CH)
RemainL: 0(00H) to 255(FFH)

Details of function: MDS received a "NAME REMAIN DATA" command outputs inputable name remaining data in the current disc.

This data sends out the quantity of name area + unused area reserved

by the specified track number.

Also, in case of specifying the track number as 0(00H), it sends out the quantity of name area + unused area of the disc.

Example of receive packet:

Maximum 1,764 English characters are recordable in the first track.

6FH, 0BH, 05H, 47H, 20H, 55H, 00H, 01H, 06H, E4H, FFH

7.21 TOC DATA

Function: Information on TOC.

Data length: 8 bytes

Data: *20H, 60H 01H*, FirstTrackNo., LastTrackNo., Min, Sec, *00H*

FirstTrackNo.: 1(*01H*) to 255(*FFH*)[usually 1]

LastTrackNo.: 1(*01H*) to 255(*FFH*)

Min: 0(*00H*) to 60(*3CH*)min

Sec: 0(*00H*) to 60(*3CH*)sec

Details of function: Information on total track number and total recorded time of the disc.

MDS outputs this data when it received "TOC DATA REQ".

Also, MDS outputs this data when information on EDIT, REC changes.

Example of receive packet:

The disc with 4 tracks and 12-second recording time.

6FH, 0DH, 05H, 47H, 20H, 60H, 01H, 01H, 04H, 00H, 0CH, 00H, FFH

7.22 TRACK TIME DATA

Function: Track time information

Data length: 6 bytes

Data: *20H, 62H, 01H, 00H*, Min, Sec

Min: 0(*00H*) to 60(*3CH*)min

Sec: 0(*00H*) to 60H(*3CH*)sec

Details of function: Information on track time.

MDS outputs this data when it received "TRACK TIME REQ" command. This data also informs the each track's time.

As MDS sends out only elapsed time in "ELAPS TIME" data, calculate the remaining time using this data in the way like track time minuses

elapsed time, if you want to indicate the remaining time.

Example of receive packet:

One track's time is 0 minutes and 8 seconds.

6FH, 0BH, 05H, 47H, 20H, 62H, 01H, 00H, 00H, 08H, FFH

7.23 DISC EXIST

Function: TOC READ completed information

Data length: 2 bytes

Data: *20H, 82H*

Details of function: Information to indicate that disc is inserted and TOC READ is completed.

When disc is inserted in remote mode, MDS outputs this data following after "DISC DATA", "STATUS".

Example of receive packet:

TOC READ has completed.

6FH, 07H, 05H, 47H, 20H, 82H, FFH

7.24 1 TRACK END

Function: Track switched.

Data length: 2 bytes

Data: *20H, 83H*

Details of function: Information to indicate the track is switched in playback or AMS mode.

MDS outputs this data when track is switched in playback or AMS mode.

This information is not output in the mode of FF or REW during playback.

Example of receive packet:

The track has been switched.

6FH, 07H, 05H, 47H, 20H, 83H, FFH

7.25 NO DISC NAME

Function: There is no disc name.

Data length: 2 bytes

Data: *20H, 85H*

Details of function: Information to indicate that there is no disc name.

When MDS receives “DISC NAME REQ” command and there is no disc name, it outputs this information in stead of “DISC NAME”.

Example of receive packet:

There is no disc name.

6FH, 07H, 05H, 47H, 20H, 85H, FFH

7.26 NO TRACK NAME

Function: There is no track name.

Data length: 2 bytes

Data: *20H, 86H*

Details of function: Information to indicate that there is no track name.

When MDS receives “DISC NAME REQ” command and there is no name for the specified track, it outputs this information in stead of “DISC NAME”.

Example of receive packet:

There is no track name.

6FH, 07H, 05H, 47H, 20H, 86H, FFH

7.27 WRITE PACKET RECEIVED

Function: Received a write name packet.

Data length: 2 bytes

Data: *20H, 87H*

Details of function: Information to indicate receiving “DISC NAME WRITE” and “TRACK NAME WRITE” commands.

In case of writing a disc name or track names, “DISC NAME WRITE” or “TRACK NAME WRITE” command is used. MDS outputs this information in order to inform that it received these commands when it received them.

Example of receive packet:

Received a write name packet.
6FH, 07H, 05H, 47H, 20H, 87H, FFH

7.28 NO TOC DATA

Function: There is no TOC information.

Data length: 2 bytes

Data: *20H, 89H*

Details of function: Indicates that there is no TOC data.

MDS outputs this data when it receives "TOC DATA REQ" command in the condition that there is no disc or TOC READ has not been completed.

Example of receive packet:

There is no TOC information.
6FH, 07H, 05H, 47H, 20H, 89H, FFH

7.29 ENTER DIVIDE MODE

Function: Entered a divide rehearsal.

Data length: 2 bytes.

Data: *20H, 8BH*

Details of function: Indicates to enter divide rehearsal condition.

When MDS receives "DIVIDE MODE REQ", it enters rehearsal condition and outputs this information and "STATUS".

Example of receive packet:

Entered DIVIDE rehearsal.
6FH, 07H, 05H, 47H, 20H, 8BH, FFH

7.30 ENTER COMBINE MODE

Function: Entered COMBINE rehearsal.

Data length: 2 bytes

Data: *20H, 8CH*

Details of function: Indicates to enter Combine rehearsal condition.

When MDS receives a "COMBINE MODE REQ", it enters Combine rehearsal condition and outputs this information and "STATUS".

Example of receive packet:

Entered Combine rehearsal.

6FH, 07H, 05H, 47H, 20H, 8CH, FFH

7.31 EDIT COMPLETE

Function: EDIT has completed.

Data length: 2 bytes

Data: *20H, 8DH*

Details of function: Indicates that EDIT has completed.

When Divide, Combine, Erase and Move have completed, MDS outputs this information.

Example of receive packet:

EDIT has completed.

6FH, 07H, 05H, 47H, 20H, 8DH, FFH

7.32 DIVIDE POINT DATA

Function: Current Divide Point

Data length: 3 bytes

Data: *20H, 8EH, Position*

Position: -128(*80H*) to +127(*7FH*)

Details of function: When MDS receives "DIVIDE ADJUST" command during the track divide rehearsal with "DIVIDE MODE REQ" command, it changes divide planed point to the position provided by Position and outputs this information.

At "DIVIDE MODE REQ" command, even if the divide planed point changes drastically, MDS outputs "DIVIDE POINT DATA" at each time the value varies by 1.

The track cannot be divided right after the track starts and right before the track ends. Therefore, at "DIVIDE MODE REQ", if absolute value of specified position is large, the value sometimes does not reach the

specified value, but MDS outputs “DIVIDE POINT DATA” responding to the time divide planed point changed.

Example of receive packet:

Divide planed point is +1.

6FH, 07H, 05H, 47H, 20H, 8EH, 01H, FFH

7.33 UNDEFINED COMMAND

Function: Received an undefined command.

Data length: 2 bytes

Data: *40H, 01H*

Details of function: Indicates that the received command is undefined.

When MDS receives an undefined command, it outputs this information.

Example of receive packet:

Received an undefined command.

6FH, 07H, 05H, 47H, 40H, 01H, FFH

7.34 IMPOSSIBLE

Function: Impossible to execute.

Data length: 2 bytes

Data: *40H, 03H*

Details of function: Indicates that received command is impossible to execute.

MDS outputs this information when the command does not fulfill the conditions to be executed.

Example of receive packets:

Impossible to execute the command.

6FH, 07H, 05H, 47H, 40H, 03H, FFH

8 Command quick reference

RS-232C Protocol for MDS-E12/11/52

1 Transmission format

Transmission format 9600bps

Character length 8 bit

Parity check no parity

Stop bit number 1 bit

Variable length byte communication data

(1 byte: header to last byte: terminator (*FFH*))

Contents of data *00H to FFH* (00 to 255)

2.1 Header

1st byte header (communication direction)

<i>7EH</i>	from PC to MDS
<i>6FH</i>	from MDS to PC

2.3 Data length

2nd byte data length

05H to 20H the number of data bytes from header to terminator

2.4 Format type

3rd byte format type: *05H*

2.5 Category

4th byte category MD: *47H*

2.6 Terminator

Data from header is completed at the terminator (*FFH*).

In case of decode, be sure to check data length against the terminator.

2.7 PC to MDS Data

5th byte	6th byte	after 7th bytes
<i>00H</i>	FF/REW OFF	
<i>01H</i>	POWER control (MDS-E11/E52 only)	
	<i>02H</i> <i>03H</i>	POWER on POWER off
<i>02H</i>	Mecha control	
	<i>01H</i>	PLAY
	<i>02H</i>	STOP
	<i>03H</i>	PAUSE ON/OFF
	<i>06H</i>	PAUSE ON
	<i>13H</i>	REW (Necessary: OFF/ REW OFF)
	<i>14H</i>	FF (Necessary: OFF/ REW CODE)
	<i>15H</i>	PREV TRACK
	<i>16H</i>	NEXT TRACK
	<i>21H</i>	REC
	<i>28H</i>	TIME MACHINE REC
	<i>40H</i>	EJECT
	<i>80H</i> <i>81H</i>	AUTO PAUSE Off AUTO PAUSE On
<i>03H</i>	10 KEY	
	<i>42H</i>	TRACK PLAY <i>01H</i> + TRACK NO. (hex)
	<i>43H</i>	TRACK PAUSE <i>01H</i> + TRACK NO. (hex)
<i>07H</i>	<i>10H</i>	ELAPSED TIME On
	<i>11H</i>	ELAPSED TIME Off
<i>0AH</i>	EDIT	
	<i>01H</i> <i>02H</i> <i>03H</i>	DIVIDE MODE REQ DIVIDE REQ EDIT MODE CANCEL
	<i>04H</i>	ERASE REQ TRACK NO. (hex) 00 is all tracks (ALL ERASE)

	<i>05H</i>	MOVE REQ TRACK No. (hex) before move + TRACK No. (hex) after move
	<i>06H</i> (MDS-E11/E52)	COMBINE MODE REQ Back side TRACK No. to combine
	<i>07H</i> (MDS-E11/E52)	COMBINE REQ Back side TRACK No. to combine +1
	<i>08H</i>	DIVIDE ADJUST POSITION (-128 to +127)
	<i>09H</i> (MDS-E12)	COMBINE MODE REQ Track No.[Former] + Track No.[Latter]
	<i>0AH</i> (MDS-E12)	COMBINE REQ Track No.[Former] + Track No.[Latter]
	<i>11H</i>	UNDO REQ
<i>10H</i>	REMOTE MODE control	
	<i>03H</i> <i>04H</i>	REMOTE MODE On REMOTE MODE Off
<i>20H</i>	INFORMATION	
	<i>01H</i> <i>10H</i> <i>20H</i> <i>21H</i> <i>22H</i> <i>24H</i>	NAME CANCEL MODEL REQUEST STATUS REQ. DISC DATA REQ. MODEL NAME REQ. REC DATE REQ. +TRACK No. (hex)
	<i>44H</i>	TOC DATA REQ. <i>+01H</i>
	<i>45H</i>	TRACK TIME REQ. <i>+01H</i> + TRACK No.
	<i>48H</i>	DISC NAME REQ. <i>+01H</i>
	<i>4AH</i>	TRACK No. NAME REQ. +TRACK No. (hex)
	<i>4CH</i>	ALL NAME REQ. <i>+01H</i>

	<i>54H</i>	REC REMAIN REQ. +01H
	<i>55H</i>	NAME REMAIN REQ. +00H+ Track No. (or disc, in case of 00)
	<i>70H</i>	DISC NAME WRITE FIRST +01H+ ASCII DATA x 16 bytes (the last data is 00h)
	<i>71H</i>	DISC WRITE CONTINUED +Packet No. (02-) + ASCII DATA x 16 byte (the last data is 00h)
	<i>72H</i>	TRACK NAME WRITE FIRST +TRACK No. + ASCII DATA x 16 byte (the last data is 00h)
	<i>73H</i>	TRACK WRITE CONTINUED +Packet No. (02-) + ASCII DATA x 16 byte (the last data is 00h)

2.8 MDS to PC Data

5th byte	6th byte	after 7th byte
<i>01H</i>	POWER control	
	<i>02H</i>	POWER ON
	<i>03H</i>	POWER OFF
<i>02H</i>	Mecha control	
	<i>01H</i>	Play
	<i>02H</i>	Stop
	<i>03H</i>	Pause
	<i>21H</i>	REC
	<i>25H</i>	REC PAUSE
	<i>40H</i>	EJECT
<i>10H</i>	SUB	
	<i>03H</i>	REMOTE ON
	<i>04H</i>	REMOTE OFF

20H	INFORMATION	
	10H	<p>MODEL DATA</p> <p>01H + FEATURE</p> <p>FEATURE: b7 ÷ b2</p> <p>000000 Fix</p> <p>b1: time machine</p> <p>b0: record function REC</p> <p>0: impossible 0: not available</p> <p>1: possible 1: available</p>
	20H	<p>STATUS DATA</p> <p>DATA1 + DATA2 + DATA3 + 01H+TRACK No.</p> <p>DATA1: b7b6: 00 fix</p> <p>b5: 0:disc EXIST</p> <p>1:No disc</p> <p>b4: 0:POWER ON</p> <p>1:POWER OFF</p> <p>b3b2b1b0:</p> <p>0000: STOP</p> <p>0001: PLAY</p> <p>0010: PAUSE</p> <p>0011: EJECT</p> <p>0100: REC PLAY</p> <p>0101: REC PAUSE</p> <p>0110: rehearsal</p> <p>0111÷1110: reserved</p> <p>1111: Play unavailable condition</p> <p>DATA2: b7: 0:TOC read not yet</p> <p>1:TOC read done</p> <p>b6: 0 Fix</p> <p>b5: 0: REC impossible</p> <p>1: REC possible</p> <p>b4b3b2b1b0:</p> <p>00000 Fix</p> <p>DATA3: b7: 0:Stereo</p> <p>1:Mono</p>

	<p>b6: 0:Copy possible 1: Copy impossible</p> <p>b5: 0:Din lock 1: Din unlock</p> <p>b4b3: 00 Fix</p> <p>b2b1b0: 001: Analog 011: Optical(only E52) 101: Coaxial 000, 010, 100, 010, 110 : Reserved</p> <p>Track No.: hex</p>
<i>21H</i>	<p>DISC DATA</p> <p><i>00H</i> + DiscData + <i>00H</i> + <i>00H</i> + <i>00H</i></p> <p>disc information:</p> <p>b7 to b4 :0000 fix</p> <p>b3: 0:No error 1:Disc error</p> <p>b2: 0:No protect 1:Protected</p> <p>b1b0: 00:reserved 01:NO 10:Pre Master 11:reserved</p>
<i>22H</i>	<p>MODEL NAME</p> <p>ASCII DATA x 14 bytes (remaining is filled with 00)</p>
<i>24H</i>	<p>REC DATE DATA</p> <p>+ Track No. + Year 1 byte + Month + Day + Hour (24-hour count) + Min + Sec</p>
<i>48H</i>	<p>DISC NAME</p> <p><i>01H</i> + ASCII DATA x 16 bytes (the last data is 00h)</p>
<i>49H</i>	<p>DISC NAME continued</p> <p>Packet No. (02-) + ASCII DATA x 16 bytes (the last data is <i>00h</i>)</p>

4AH	TRACK NAME TRACK NO + ASCII DATA x 16 bytes (the last data is 00h)
4BH	TRACK NAME continued Packet No. (02-) + ASCII DATA x 16 byte (the last data is 00h)
4CH	ALL NAME END
51H	ELAPSED TIME (in case of sec changes during play) TRACK No. + 01H + MIN + SEC
54H	REC REMAIN DATA 01H + MIN + SEC
55H	NAME REMAIN DATA + 00H + Track No. (or DISC in case of 00) + Remain (2 bytes)
60H	TOC DATA (claims if EDIT, REC etc. change) 01H + First Track No. + Last Track No. + Min + Sec + 00H
62H	TRACK TIME DATA 01H + 00H + MIN + SEC
82H	DISC EXIST
83H	1 TRACK END
85H	NO DISC NAME
86H	NO TRACK NAME
87H	WRITE PACKET RECEIVED
89H	NO TOC DATA
8BH	ENTER DIVIDE MODE
8CH	ENTER COMBINE MODE
8DH	EDIT COMPLETE
8EH	DIVIDE POINT DATA + DIVIDE POINT DATA (-128 to +127)

<i>40H</i>	Message	
	<i>01H</i>	UNDEFINED COMMAND
	<i>03H</i>	IMPOSSIBLE