

## File Formats

### ■ File type

The GX-1 creates one binary-format data file and one ASCII-format header file each time recording pauses or stops.

**Data File:** A binary file containing binary-format data through A/D conversion. Each data file has the filename extension of **.dat**.

**Header File:** A text file (ASCII code) containing recording information such as conditions. Each header file has the filename extension of **.hdr**.

- The data is stored in the DOS format on an MO, PC card, or medium on a PC. On an AIT cartridge, however, the data is stored in a TEAC unique format. To utilize the data on an AIT, you can use **GX Navi** to copy the data as a TAFMat file to a PC, or use separate software **GX View** to read data from a PC's external AIT drive.
- When voice memo is recorded in the **BEFORE** or **AFTER** mode, a WAVE file is created in addition to a header and a data file. The WAVE files can be opened in Windows Media Player.

### ■ Filename

Within the same ID, the data file and header file have the same filename, which begins with five alphanumeric characters and is followed by a three-digit number.

The first five characters are entered in the **Data Set Name** field in the **New** dialog box. You cannot use the \ / \* ? < > | " ; and ; characters. When 4 or fewer characters are entered, zeros (0) are embedded between the filename and the 3-digit number to give a total of 8 characters.

The three-digit number is the **ID** number beginning from **001**. When **File number auto increment** is selected in the **New** dialog box, the ID number is automatically incremented whenever recording is restarted after a **STOP** (or after a pause). If not selected when recording into the PC, the number begins from **001** every time you start recording after a **STOP**. If, then, the data file of the same name already exists, it is overwritten. If the data file of the same name already exists when recording on the removable medium, the data files are automatically numbered consecutively through the medium regardless of selecting or not. When a new filename is given, the number automatically begins from **001**.

### ■ Data file

A-to-D converted data is stored as an two-byte integer ranging from -32768 to +32767. Negative values are represented by two's-complement numbers.

The order of bytes is so called "Intel format": the lower byte first, and the upper last.\*1

The order of data is **INTERLACED** format\*2: the first channel of the first sampling, the second channel of the first sampling, . . . , the last channel of the first sampling, the first channel of the second sampling, the second channel of the the second sampling, and so on.

When voice memo is recorded in the **MIX** mode, the voice data is appended to the last channel data of each sampling.

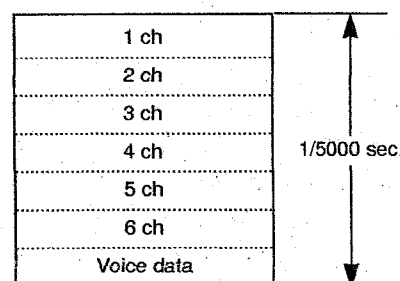
\*1: The format in which the upper byte comes first and the lower last is called "Motorola format," and is adopted for workstations and FFT analyzers with Motorola CPUs.

\*2: In the **SEQUENTIAL** format, data is arranged in a different order: the first channel of the first sampling, the first channel of the second sampling, . . . , the first channel of the last sampling, the second channel of the first sampling, the second channel of the second sampling, and so on.

The following example shows how the data files are organized. A block of data shown in the example is referred to as a **scan**. A data file consists of repetitions of scans.

**Ex** A scan of data recorded at a sampling frequency of 5 kHz for channels 1 to 6 together with voice data recorded in **MIX** mode.

Order of data in data file



## ■ Header File

A header file is an ASCII text file in which information such as recording conditions is written. The header file format conforms to DADiSP format for waveform analytical software. Like all ASCII text files, header files can be read by text editors such as the Windows Notepad. Each line of a header file contains information of each recording condition. The parameters are separated by commas. The following code is an example of a header file created when voice memo is recorded in the MIX mode, and is followed by an explanation.

### ● Example of Header File

```
DATASET GX100001
VERSION 1
SERIES CH3_AR-GXDC, CH4_AR-GXDC, CH9_AR-GXDC, CH10_AR-GXDC, MEMO
DATE 02-02-2000
TIME 15:52:17.00
RATE 5000
VERT_UNITS V , V , V , V , V
HORZ_UNITS Sec
COMMENT <<< TEAC GX-1 >>>
NUM_SERIES 5
STORAGE_MODE INTERLACED
FILE_TYPE INTEGER
SLOPE 0.00004000, 0.00004000, 0.00004000, 0.00004000, 0.00004000
X_OFFSET 0
Y_OFFSET 0.0, 0.0, 0.0, 0.0, 0.0
NUM_SAMPS 20720
DATA
DEVICE GX-1
CH1_3 AR-GXDC,RANGE=1V,FILTER=400Hz
CH2_4 AR-GXDC,RANGE=1V,FILTER=400Hz
CH3_9 AR-GXDC,RANGE=1V,FILTER=OFF
CH4_10 AR-GXDC,RANGE=1V,FILTER=OFF
CH5_11 MEMO,RANGE=1V,FILTER=OFF
CH_SLOT 2, 2, 1
CLOCK INTERNAL
MARK 9335
GX-1_VOICE_MEMO ADDED TO THE END OF EACH SCANNING DATA
GX-1_VERSION 13, 0C, 1.24, 1.09, 1.61
GX-1_OPTION 0001
GX-1_SYS
```

### ● Explanation of Header File

DATASET :	The file name.
VERSION :	Data version number (Fixed at 1).
SERIES :	Number of channel used for recording. Channel names follow the under bars. "MEMO" is appended when voice memo is recorded in the MIX mode.
DATE :	Date when recording started. (mm-dd-yyyy)
TIME :	Time when recording started. (hh:mm:ss)
RATE :	Sampling frequency (Unit: Hz). This is 1 for external sampling.
VERT_UNITS :	Units for each channel. "V" is appended when voice memo is recorded in the MIX mode.
HORZ_UNITS :	Units for time axis (Fixed at Sec).
COMMENT :	Comment entered in the <b>New</b> submenu.
NUM_SERIES :	Number of recording channels. One channel is added when voice memo is recorded in the MIX mode.
STORAGE_MODE :	Order of stored data. Fixed at INTERLACED because data is stored in the order of sampling.
FILE_TYPE :	Fixed at INTEGER because data is a two-byte integer.
SLOPE :	Coefficient for physical-value conversion. "0.00004000" is appended when voice memo is recorded in the MIX mode.
X_OFFSET :	Position of the first data on the time axis. Normally 0. In trigger recording, the specified time is written here in unit of second even when it is specified in terms of "scans". (Decimals are omitted.) A minus sign precedes the value in pretrigger mode, and a plus sign in posttrigger mode.
Y_OFFSET :	Offset for physical-value conversion. "0.0" is appended when voice memo is recorded in the MIX mode.
NUM_SAMPS :	Number of sampled data per channel.
DATA :	Indicates that the following information is unique to this device and is different from the DADiSP format.
DEVICE :	Fixed at GX-1.
CH1_ :	Channel number, type of amplifier, range setting, and filter setting follow the under bar.
CH_SLOT :	Number of channels per each slot. "1" is appended when voice memo is recorded in the MIX mode.
CLOCK :	Source of sampling clock
MARK :	Number of scans at the moment an event mark is attached.
GX-1_VOICE_MEMO:	Indicates the recording mode for voice memo. This is an example of MIX mode. In BEFORE mode, "WAV_FORM 16BITS 8KHZ BEFORE TRIGGER" is written here, and in AFTER mode, "WAV_FORM 16BITS 8KHZ AFTER TRIGGER."

### ■ Converting Data to Physical Value

An A-to-D converted value is an integer ranging from -32768 to +32767 and is  $\pm 25000$  when the input is  $\pm 100\%$  of the selected input range. The input physical value is figured out by the following formula:

The value in the data file  $\times$  The value of SLOPE in the header file + The value of Y\_OFFSET in the header file

- The Y\_OFFSET values are zero except when the thermocouple input amplifiers AR-GXTCK/J are used.

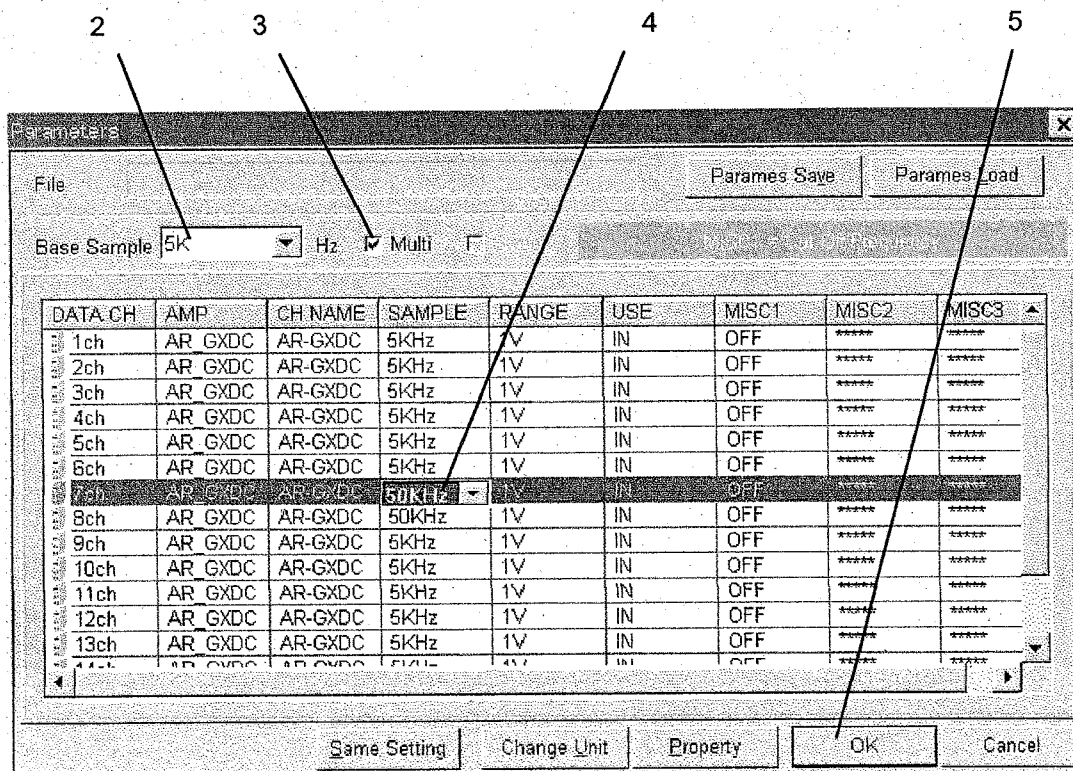
## GX-1 Multi-sampling

### General

You can choose from two different sampling frequencies for each slot. The ratio between the lower frequency (base sample frequency) and the higher frequency must be 1:10. The higher frequency cannot exceed 200 kHz, and the total of [sampling-frequency x number-of-channels] must not exceed the maximum transfer rate of recording media. Note that data files recorded in multi-sampling mode cannot be read by commercially available analytical software.

### Settings

1. Run **GX Navi** and choose **Params** from the **Setup** menu.
2. Choose the lower frequency from the **Base Sample** drop down list.
3. Turn on the **Multi** check box.
4. Choose the frequency 10 times the Base Sample from the **SAMPLE** drop down list for each slot.
5. Click **OK**.



Note: Voice memo is sampled at the base sample frequency when it is recorded in the **MIX** mode.

## Data File Format

The following examples show how the data files (with the extension **dat**) are organized.

### Example 1

Slot number	Channel number	Sampling Freq.
1	1	1 kHz
	2	
2	3	10 kHz
	4	
3	5	10 kHz
	6	
4	7	1 kHz
	8	

Order of data

Repetition of 1 to 44 shown below

1	Ch 1
2	Ch 2
3	Ch 3
4	Ch 4
-	-
-	-
-	-
21	Ch 3
22	Ch 4
23	Ch 5
24	Ch 6
-	-
-	-
-	-
41	Ch 5
42	Ch 6
43	Ch 7
44	Ch 8

Channel 3 and 4 are sampled 10 times

Channel 5 and 6 are sampled 10 times

### Example 2

The example below shows the case that the voice memo is recorded in the **MIX** mode.

Slot number	Channel number	Sampling Freq.
1	1	1 kHz
	2	
2	3	10 kHz
	4	
3	5	1 kHz
	6	
4	7	10 kHz
	8	
Voice memo	9	1 kHz

Order of data

Repetition of 1 to 45 shown below

1	Ch 1
2	Ch 2
3	Ch 3
4	Ch 4
-	-
-	-
-	-
21	Ch 3
22	Ch 4
23	Ch 5
24	Ch 6
25	Ch 7
26	Ch 8
-	-
-	-
-	-
43	Ch 7
44	Ch 8
45	Voice

Channel 3 and 4 are sampled 10 times

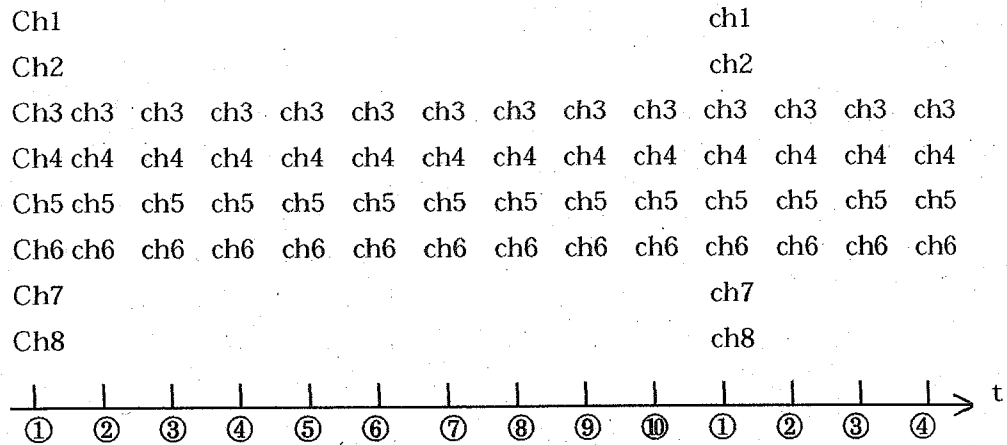
Channel 7 and 8 are sampled 10 times

## Sample Timing

① to ⑩ in the figure below indicates the sample timing for the **Example 1**.

1 kHz sampling is done at the point ⑩, and 10 kHz at the points ① to ⑩.

At ①, all the channels are sampled at the same time.



The order of samples in the data file is shown below:

Order	Data	Order	Data
1	Ch 1-①	23	Ch 5-①
2	Ch 2-①	24	Ch 6-①
3	Ch 3-①	25	Ch 5-②
4	Ch 4-①	26	Ch 6-②
5	Ch 3-②	27	Ch 5-③
6	Ch 4-②	28	Ch 6-③
7	Ch 3-③	29	Ch 5-④
8	Ch 4-③	30	Ch 6-④
9	Ch 3-④	31	Ch 5-⑤
10	Ch 4-④	32	Ch 6-⑤
11	Ch 3-⑤	33	Ch 5-⑥
12	Ch 4-⑤	34	Ch 6-⑥
13	Ch 3-⑥	35	Ch 5-⑦
14	Ch 4-⑥	36	Ch 6-⑦
15	Ch 3-⑦	37	Ch 5-⑧
16	Ch 4-⑦	38	Ch 6-⑧
17	Ch 3-⑧	39	Ch 5-⑨
18	Ch 4-⑧	40	Ch 6-⑨
19	Ch 3-⑨	41	Ch 5-⑩
20	Ch 4-⑨	42	Ch 6-⑩
21	Ch 3-⑩	43	Ch 7-①
22	Ch 4-⑩	44	Ch 8-①

## Header File Format

The following is a header file for the **Example 2**:

DATASET GX100001

VERSION 1

SERIES CH1\_AR-GXDC, CH2\_AR-GXDC, CH3\_AR-GXDC, CH4\_AR-GXDC, CH5\_AR-GXDC,  
CH6\_AR-GXDC, CH7\_AR-GXDC, CH8\_AR-GXDC, MEMO

DATE 06-19-2000

TIME 18:32:15.00

RATE 1000

“Base Sample” frequency

VERT\_UNITS V , V , V , V , V , V , V , V , V

HORZ\_UNITS Sec

COMMENT <<< TEAC GX-1 >>>

NUM\_SERIES 9

STORAGE\_MODE INTERLACED

FILE\_TYPE INTEGER

SLOPE 0.00004000, 0.00004000, 0.00004000, 0.00004000, 0.00004000, 0.00004000, 0.00004000,  
0.00004000, 0.00004000

X\_OFFSET 0

Y\_OFFSET 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0

NUM\_SAMPS 1320

DATA

DEVICE GX-1

CH1\_1 AR-GXDC,RANGE=1V,FILTER=400Hz

CH2\_2 AR-GXDC,RANGE=1V,FILTER=400Hz

CH3\_3 AR-GXDC,RANGE=1V,FILTER=4KHz

CH4\_4 AR-GXDC,RANGE=1V,FILTER=4KHz

CH5\_5 AR-GXDC,RANGE=1V,FILTER=4KHz

CH6\_6 AR-GXDC,RANGE=1V,FILTER=4KHz

CH7\_7 AR-GXDC,RANGE=1V,FILTER=400Hz

CH8\_8 AR-GXDC,RANGE=1V,FILTER=400Hz

CH9\_9 MEMO,RANGE=1V,FILTER=OFF

CH\_SLOT 2, 2, 2, 2, 1

CLOCK INTERNAL

RATE\_MULTI 1000, 10000, 10000, 1000, 1000

Sampling frequency for the slot #1

Sampling frequency for the slot #2

Sampling frequency for the slot #3

Sampling frequency for the slot #4

Sampling frequency for voice memo

GX-1\_VOICE\_MEMO ADDED TO THE END OF EACH SCANNING DATA

GX-1\_VERSION 21, 0C, 2.03, 1.09, 3.12