C1 MUSIC COMPUTER

Operating Manual

YAMAHA

FCC INFORMATION

While the following statement is provided to comply with FCC regulations in the United States, the corrective measures listed are applicable worldwide.

"WARNING — This equipment has been certified to comply with the limits for a Class B computing device, pursuant to Subpart J of Part 15 of FCC Rules. Only peripherals (computer input/output devices, terminals, printers, etc.) certified to comply with the Class B limits may be attached to this computer. Operation with non-certified peripherals is likely to result in interference to radio and TV reception."

The C1 and its accessories have been tested and certified to be in compliance with the limits established for this class of equipment pursuant to FCC Rules Part 15, Subpart J. These limits were established to provide a reasonable measure of protection against such interference; however, this does not guarantee that interference will not occur. If the C1 equipment is suspected of causing interference with other electronic equipment, verification can be made by turning off the C1.
If the interference continues, then the C1 is not the source of the interference. If the C1 does appear to be the source of the interference, you should try to correct the situation by one or more of the following measures.

- Relocate either the C1 and its accessories or the electronic equipment that is being affected by the interference.

- Utilize power outlets for the C1 and the equipment being affected that are on different branch circuits (utilizing different circuit breakers or fuses), or install AC line filters.

- In the case of radio interference, relocate the antenna. If the antenna cable is 300 ohm ribbon lead, have it changed to 75 ohm coaxial cable (utilizing the necessary transformer/adaptors at either end, as required to match the cable).

- Use shielded interface cables when connecting peripherals to the C1.

If these corrective measures do not produce satisfactory results, please contact a Yamaha Retailer authorized to sell this product for suggestions and/or corrective measures. If you cannot locate a Yamaha Retailer authorized to sell this product in your general area, please contact the Yamaha Corporation of America, Electronic Service Division, 6600 Orangethorpe Avenue, Buena Park, CA 90620, USA.

If for any reason you should need additional information relating to radio and TV interference, you may find a booklet prepared by the Federal Communications Commission helpful: "How to Identify and Resolve Radio/TV Interference Problems." This booklet, Stock 004-000-00345-4, is available from the U.S. Government Printing Office, Washington D.C. 20402.

IMPORTANT SAFETY INSTRUCTIONS

1. Read all of these instructions.

2. Save these instructions for later use.

3. Follow all warnings and instructions marked on the product.

4. Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or acrosol cleaners. Use a damp cloth for cleaning.

5. Do not use this product near water.

6. Do not place this product on an unstable cart, stand, or table. The product may fall, causing serious damage to the product.

7. Slots and openings in the cabinet and the back or bottom are provided for ventilation; to ensure reliable operation of the product and to protect it from overheating, these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface. This product should never be placed near or over a radiator or heat register. This product should not be placed in a built-in installation unless proper ventilation is provided.

8. This product should be operated from the type of power source indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.

9. This product is equipped with a 3-wire grounding type plug, a plug having a third (grounding) pin. This plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the purpose of the grounding-type plug.

10. Do not allow anything to rest on the power cord. Do not locate this product where persons will walk on the cord.

11. If an extension cord is used with this product, make sure that the total of the ampere ratings on the products plugged into the extension cord do not exceed the extension cord ampere rating. Also, make sure that the total of all products plugged into the wall outlet does not exceed 15 amperes.

12. Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electric shock. Never spill liquid of any kind on the product.

13. Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous voltage points or other risks. Refer all servicing to service personnel.

14. Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

    A. When the power cord or plug is damaged or frayed.
    B. If liquid has been spilled into the product.
    C. If the product has been exposed to rain or water.
    D. If the product does not operate normally when the operating instructions are followed. Adjust only those controls that are covered by the operating instructions since improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal operation.
    E. If the product has been dropped or the cabinet has been damaged.
    F. If the product exhibits a distinct change in performance, indicating a need for service.

This information on safety is provided to comply with U.S.A. laws, but should be observed by users in all countries.

Thank you for purchasing the C1 Yamaha Music Computer. The C1 is a personal computer with built-in interfaces for MIDI and tape synchronization.

Throughout this manual, "C1" refers to both the C1 (floppy disk model) and the C1/20 (hard disk model).
The first part of this manual explains basic operation of the C1.
The second part of this manual explains how to use the MIDI Monitor program included with the C1.
The third part of this manual explains how to use the Bulk Manager program included with the C1.

Table of Contents

Precautions

A. Always grip the plug directly when disconnecting the power cord from an AC outlet. Disconnecting power by pulling on the cord can result in damage to the cord and possibly a short circuit.

B. If necessary, clean the product using a slightly damp cloth, and dry with a soft cloth. Never use solvents (such as benzine or thinner) since they can melt or discolor the finish.

C. Yamaha Digital Musical Instrument products utilize computer circuitry that is sensitive to voltage spikes. For this reason, the unit should be turned off and unplugged from the AC outlet in the event of an electrical storm. This precaution will avoid the possibility that a high voltage spike caused by lightning will damage the unit.

D. Avoid rough handling, such as applying excessive force to the switches or dropping the unit.

   Do not put this unit in an upright position.
   If the unit falls over, damage may result.

E. Some Yamaha Digital Musical Instrument products utilize external cartridges or disks for data storage. When inserting a cartridge or disk, make sure it is facing the correct way, and do not use excessive force.

F. Avoid placing the unit in direct sunlight, or in locations where the unit is likely to be subjected to vibration, excessive dust, cold or moisture.

G. Before making connections, be sure to turn the power off for the C1 and all peripheral equipment.

H. Before turning the power off, wait until both of the "Disk in Use" LEDs go out, and remove the floppy disk(s). *Turning off the power while a "Disk in Use" LED is lit can damage the disk.*

Specifications

|	
CPU:	80286 (switchable clock 10/8 MHz)
RAM:	640 Kbytes main, 512 Kbytes extension
ROM:	64 Kbytes
Disk:	FDD model: 3.5" 2DD floppy disk x 2 HDD model: 3.5" 2DD floppy disk x 1 3.5" 20M byte hard disk x 1
Display:	640 × 400 dot backlit LCD
VRAM:	64 Kbytes
External Display Output:	Digital RGB, Video (Monochrome Display mode)
Interface:	Printer (Centronics) × 1, Serial (RS232C) × 2, MIDI IN × 2, MIDI OUT × 8, MIDI THRU × 1 Time Code In, Time Code Out, Expansion Card Slot
Dimensions:	394 (W) × 382 (D) × 82 (H) mm (15-1/2" × 15" × 3-1/4")
Weight:	FDD model: 8.2 kg (18 lb 2 oz) HDD model: 8.5 kg (18 lb 12 oz)
Power Requirements:	120V 60 Hz
Power Consumption:	120V/0.6A Max.
AC Outlet:	132 V/1 A Max.
Backup Battery:	Ni-Cd
Included Items:	Power cable, 3.5" disk × 2 (MS-DOS 3.3, MIDI Monitor and Bulk Manager), Operating manual

C1 MUSIC COMPUTER

Basic Operation

Floppy Disk

Backup Battery

To open the C1, press the latch on the front of the C1 and the display screen will rise slightly. Move the panel up to an appropriate viewing angle. Making sure that the C1 power switch is off, connect the included power cable to the AC inlet on the rear panel of the C1, and plug it into an AC outlet.

The C1 uses 3.5" 2DD floppy disks. When you buy new blank disks, be sure that they are the correct type. New disks must be Formatted before they can be used. Page 15 tells you how to format a disk.

To insert a floppy disk, gently push it all the way (label facing up, metal shutter first) into the disk drive located on the right side panel of the C1. To remove the floppy disk, press the disk eject button and the floppy disk will pop out. Gently pull the disk all the way out.
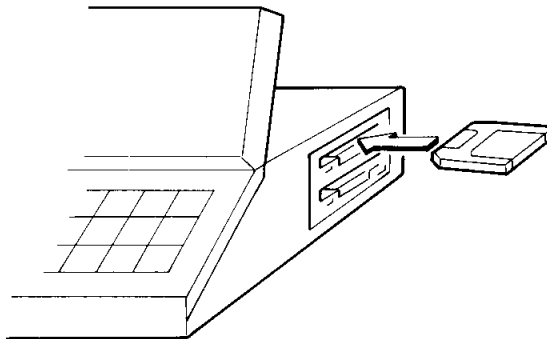

Write Protect
There is a sliding "write protect tab" on the corner of each 3.5" floppy disk. By sliding the tab so that the hole is exposed, you can "write protect" the disk so that the computer cannot change the information on the disk. In this way you can ensure that important information is not accidentally erased.

The C1 has a Ni-Cd battery to power its realtime clock and preserve system settings. About 48 hours of normal use will fully recharge the battery. When the battery is fully charged it will preserve system settings for about 4 weeks at room temperature. If the battery is low when you turn the C1 on, you will be asked to run the SETUP program (See page 13).
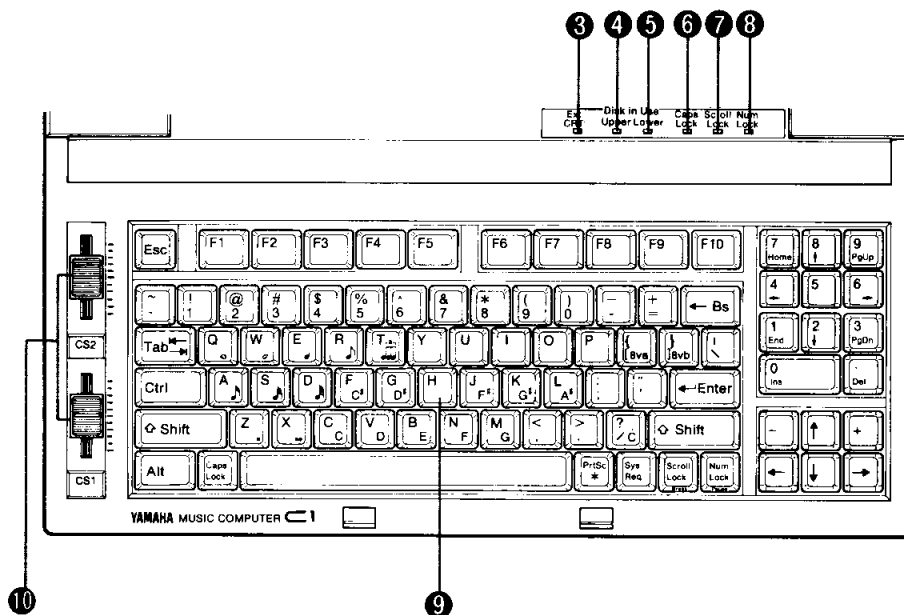
Front/Side/
Rear Panel

Front Panel
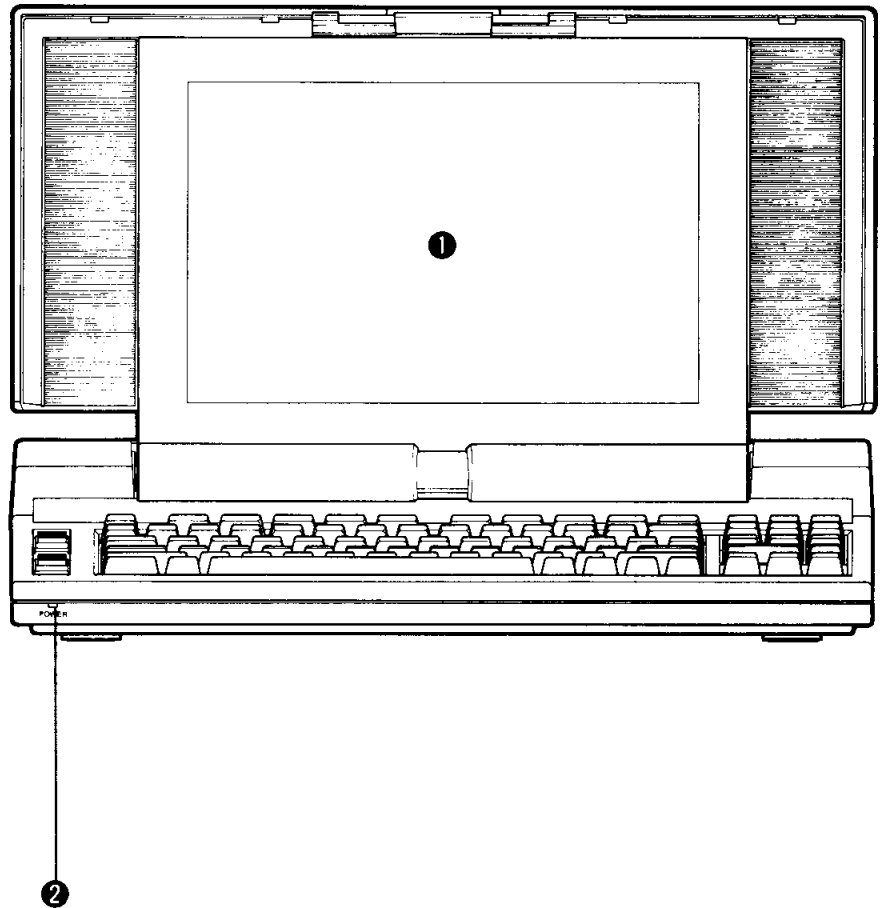
❶ LCD Display:
Backlit 640 × 400 dot Liquid Crystal Display. When this display screen is folded down, the backlight is automatically turned off. The left side panel has controls for LCD contrast and backlight brightness.

❷ Power LED
This LED lights when the C1's power is turned on.

❸ Use External CRT:
This LED indicates that an external display is being used instead of the C1's built-in LCD screen. (Page 30 explains how to use an external display.)

❹ Disk in Use Upper Drive:
This LED lights red to indicate that the floppy disk in drive A is being accessed. *Do not remove the floppy disk or turn the power off while this LED is on.*

❺ Disk in Use Lower Drive:
This LED lights red to indicate that the floppy disk in drive B (or the hard disk in drive C for hard disk models) is being accessed. For the hard disk model, this LED lights green to indicate that the read/write head is unparked. (The hard disk read/write head automatically parks itself to a safe position when there has been no disk access for 5 seconds.) *Do not remove the floppy disk or turn the power off while this LED is on.*

❻ Caps Lock LED:
The "Caps Lock" key toggles this LED on/off. When this LED is on and the Shift key is released, alphabet keys A — Z will produce uppercase letters. When the Shift key is pressed, lowercase letters will be produced.

❼ Scroll Lock LED:
The "Scroll Lock" key toggles this LED on/off. The effect will be determined by the application program.

❽ Num Lock LED:
The "Num Lock" key toggles this LED on/off. When it is on, the numeric key pad at the right side of the alphabet keys can be used to enter numbers 1 — 9. When it is off, the numeric key pad will act as the cursor (arrow) and other function keys.

❾ Keyboard:
A standard 88-key ASCII keyboard. The effect of the function keys and control keys will be determined by the application program.

❿ Control Slider 1,2:
These general purpose sliders function as determined by the application program (the MIDI Monitor program, etc.).

Right Side Panel
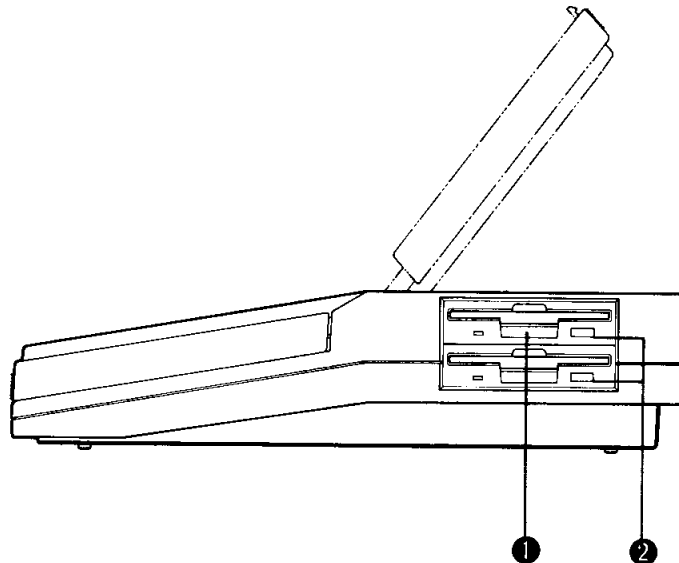
❶ 3.5" Floppy Disk Drive:
The C1 has two 3.5" 720 Kbyte floppy disk drives.
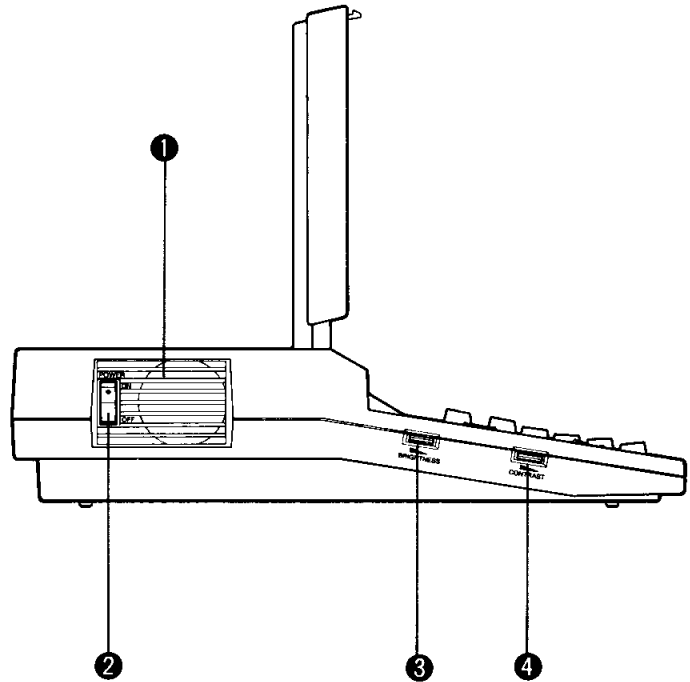
❷ Floppy Disk Eject Button:
Press this button to eject the floppy disk.

❸ 3.5" Hard Disk Drive (HDD model):
The hard disk model of the C1 has a 3.5" non-removable hard disk instead of the lower floppy disk drive.

Left Side Panel

❶ **Vent:**
To prevent overheating, do not obstruct the cooling fan vent.

❷ **Power Switch:**
Push this switch up to turn the power on. Push down to turn the power off.
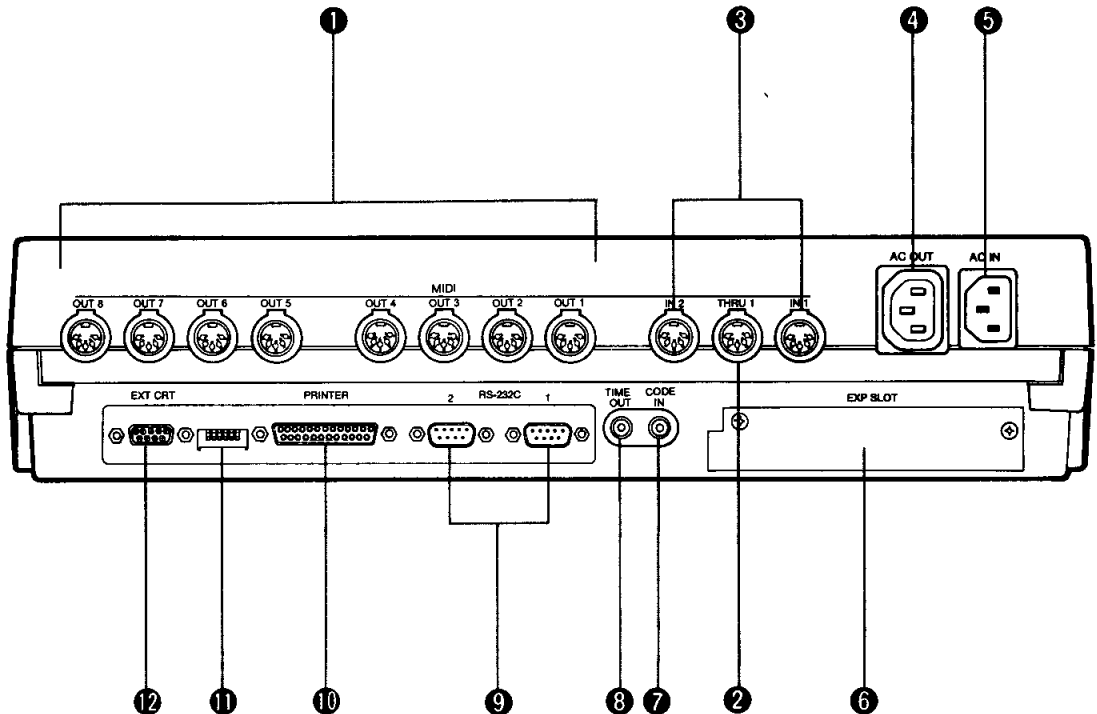
❸ **Backlight Brightness Control:**
Rotate this control towards you to darken the backlight.

❹ **LCD Contrast Control:**
Rotate this control towards you to decrease the contrast of the LCD. Adjust it to suit your viewing angle. *Extreme settings of this control will make the LCD screen appear blank.*

Rear Panel

① MIDI OUT:
The C1 can transmit MIDI messages from these terminals.

② MIDI THRU:
MIDI messages received at MIDI IN 1 are re-transmitted unchanged
from this terminal.

③ MIDI IN:
The C1 can receive MIDI messages at these terminals.

④ AC Out:
This AC outlet is powered when the C1's power is on. When using
an external display screen (IBM Monochrome Display), connect
its AC cable to this outlet. Some displays may be damaged if powered
on without an incoming video signal. Using this AC outlet for the
display ensures that the display is not turned on unless the C1's
power is on.

❺ AC IN:
Connect this terminal to an AC outlet using the included power cable.

❻ Expansion Slot:
Optional cards such as extended memory can be plugged into this slot.

❼ TIME CODE IN:
The C1 can receive time code from a tape recorder line output connected to this terminal. (Use a pin plug cable.)

❽ TIME CODE OUT:
The C1 can transmit time code from this terminal to a tape recorder line input connected to this terminal. (Use a pin plug cable.)

❾ RS232C:
These are standard connectors for attaching a serial mouse or a modem.

❿ PRINTER:
A Centronics-type printer can be connected to this terminal.

⓫ DIP Switches:
These six switches determine system settings and display modes as explained on page 30.

⓬ CRT (See DIP SW2, page 30):
A IBM PC Color Graphic Display (CGA mode) or IBM PC Monochrome Display (Hercules graphics card compatible mode) can be connected to this terminal.

First-time Operation

When the C1's power is first turned on (or when the C1 has not been used for a long time, etc.), you will get the following message:

```
Invalid configuration information - please run SETUP
program Strike the F2 key to continue
```

When you press F2, the setup program will be executed and you will see something like the following screen. Use the ↑ ↓ keys to select the entries, and use the ← → keys to change the entries to match the screen shown below. Make settings for Base Memory and Extended Memory by typing the correct value using the numeric keys 1-0. To see an explanation of the item indicated by the cursor, press F1. (Notice that the hard disk model requires different settings for drives B: and C:.)

```
Phoenix Technologies Ltd.
System Configuration Setup V4.0

Time: 15:54:39
Date: Wed May 18, 1988

Diskette A:          3.5 Inch, 720 KB
Diskette B:          3.5 Inch, 720 KB (Not Installed)*
Hard Disk C:         Not Installed (Type 2)*
Hard Disk D:         Not Installed
Base Memory:         640 KB
Extended Memory:     512 KB
Display:             CGA80

Coprocessor:         Not Installed
```

When you have finished setting all entries, press ESC.

* For the hard disk model, make the settings shown in parentheses ( ).

MS-DOS

The Microsoft Disk Operating System (MS-DOS) supplied on the disk included with the C1 is a "master program" that manages the entire computer.

Application programs such as the MIDI Monitor (and word processors, sequencers, games, etc.) run under the supervision of MS-DOS. Think of DOS as part of the computer. Normally, you will first start DOS whenever you use the computer.

To start DOS, insert the included system disk into the floppy disk drive A (making sure to push it in until you feel the "click") and turn the power on. (You can also reset the system to start DOS by pressing the Ctrl + Alt + Del keys together.) If the C1 is being used for the first time (or if it has been turned off for longer than approximately four weeks), you will be asked to run the SETUP program, as explained on page 13. Normally, when DOS starts, various copyright messages will be displayed, and you will be asked to enter the date and time. If they are correct, simply press the ENTER key. If not, enter the correct date and time.

When entering a new date, separate the month, day and year by a hyphen "-". For example if the current date is May 26, 1988, type

    5-26-88

and press ENTER. When entering a new time, separate the hour, minute and seconds by a colon ":". (Seconds are optional.) For example if the current time is 4:43 PM, type

    16:43

and press ENTER.

DOS Command Level

When you have entered the date and time, MS-DOS will display a "system prompt" consisting of a single character followed by a "greater than" symbol " > "; for example "A > ". This indicates that MS-DOS is ready for your commands. The character "A" indicates the default disk drive — i.e., the disk drive that MS-DOS will use unless you specify another disk drive.

Whenever you see the system prompt, you can give MS-DOS a command by typing a word and pressing the ENTER key. MS-DOS makes no distinction between uppercase or lowercase characters in the command you type.

Making a Backup Disk

Before you do anything else, you should make a copy of the MS-DOS disk included with the C1. Follow the steps below.

Note for hard disk model

The hard disk model has one floppy drive (drive A) and one hard disk drive (drive C). However you may type MS-DOS commands as if there were another floppy disk drive B connected to the system. Instead of A and B representing drives, they will represent disks. MS-DOS will keep track of the floppy disks, and prompt you to

```
    Insert diskette for drive B: and strike any key
    when ready
```

etc. as necessary. (Initially, the floppy disk drive will be called "A".) In this way you can easily copy data from one floppy disk to another, even with just a single floppy disk drive.

Formatting

New blank disks you buy for data storage must be "formatted" before the C1 can use them. Formatting erases all information on the disk. Make sure that the write protect tab of the orginal system disk is in the Protect position (hole exposed) and insert it in drive A. Type

```
    format b:/s
```

and press ENTER. You will be asked to insert a new disk in drive B. Make sure that the write protect tab of the new disk is in the Unprotect position (hole covered), and insert the disk to be formatted into drive B. Press ENTER, and formatting will begin.

If you want to format another disk at this point, enter "Y" and insert another new disk in drive B. Else enter "N".

Copy

Next we will copy the original system disk to the newly formatted disk. Type

```
    copy *.* b:
```

and press ENTER. All files will be copied to disk B.

From now on, use the copy of the system disk you just made, and keep the original in a safe place.

Files

Data on a disk is organized in *files*. A primary job of MS-DOS is disk file management. To see a listing of the files on the disk, type

    `dir`

(directory) and press Enter. You will see something like this:

```
Volume in drive A has no label
Directory of  A:\

COMMAND       COM      25308     2-02-88     12:00a
FORMAT        COM      11703    12-26-87      1:21p
DISKCOPY      COM       6264     2-09-88     12:00a
DEBUG         COM      15866     2-09-88     12:00a
THATFILE      DOC      18325    10-10-87      2:56p
THISFILE      DAT       2943     6-08-88     11:51p
        7 File(s)        582788 bytes  free
```

Each file has an eight-character name and a three-character extension. (The extension is optional, but is handy for indicating the type of data in the file.) The size of the file (in bytes) and the date and time that the file was created are also displayed. The bottom line tells you the number of filenames displayed and the data space.

Default Drive

The system prompt (e.g. "A > ") indicates the disk drive that MS-DOS will assume unless you specify otherwise. If the system prompt indicates "A" and you type

    `dir`

you will get the directory of the disk in drive A. You can also specify the disk drive, for example by typing

    `dir b:`

to get the directory of the disk in drive B. (Always follow the disk drive character with a colon ":".)

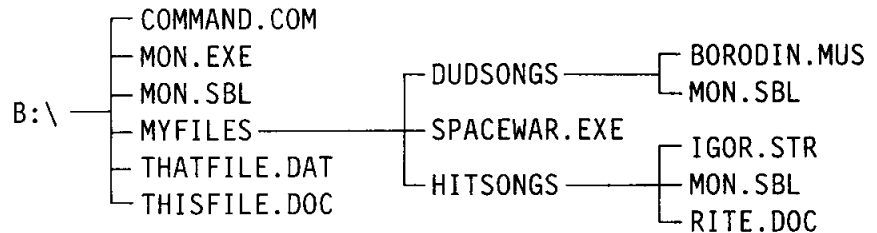To change the default disk drive, type the desired letter followed by a colon; e.g.

    `b:`

The system prompt will change to indicate the new default drive.

Directories

A single disk (especially a hard disk) can accomodate hundreds of files, and finding the filename you need can become timeconsuming. MS-DOS allows you to create additional *"directories"* inside the main or "root" directory. If a disk will be used to hold large numbers of files, it is often a good idea to create additional directories for easier file management.

For example, a single disk might contain multiple directories as follows.

```
          ┌─ COMMAND.COM
          ├─ MON.EXE                                    ┌─ BORODIN.MUS
          ├─ MON.SBL           ┌─ DUDSONGS ───────┤
B:\ ──────┤                    │                  └─ MON.SBL
          ├─ MYFILES ──────────┼─ SPACEWAR.EXE
          ├─ THATFILE.DAT      │                     ┌─ IGOR.STR
          └─ THISFILE.DOC      └─ HITSONGS ──────────┼─ MON.SBL
                                                     └─ RITE.DOC
```

MKDIR:

To create a new directory inside the current directory, type (for example)

    mkdir myfiles

This would make a new directory named MYFILES. If you now type DIR to see the directory, you will notice that a new entry MYFILES < DIR > has been added, as follows.

```
    Volume in drive B has no label
    Directory of  B:\

    COMMAND     COM     25303     2-02-88    12:00a
    MON         EXE    142944     1-01-88    12:00a
    MON         SBL       375     1-01-88    12:00a
    MYFILES           <DIR>                  5-18-88     2:25p
    THATFILE    DAT      9822     1-14-88     4:23p
    THISFILE    DOC     14398     4-29-88    12:00a
             4 File(s)       454656 bytes free
```

CHDIR:

To change directories, type (for example)

    chdir myfiles

Now when you type DIR, you will see something like this.

```
Volume in drive B has no label
Directory of  B:\MYFILES

.                    <DIR>           5-18-88      2:25p
..                   <DIR>           5-18-88      2:25p
DUDSONGS             <DIR>           5-18-88      2:26p
SPACEWAR      EXE       91423        4-01-85     13:13a
HITSONGS             <DIR> 5-18-88    2:26p
             5 File(s)       454656 bytes free
```

The "parent" directory is indicated by two periods "..". (The one period "." entry has no direct meaning for the user.) Thus, you could type

    chdir ..

to return to the parent directory of the directory you are in.
Directories below the root directory will be indicated by a backslash character "\". Thus, you could type (from the root directory)

    chdir \myfiles\hitsongs

to enter the HITSONGS directory inside the MYFILES directory.

If you typed *"dir"* from inside the HITSONGS directory (or if you typed *"dir \myfiles\hitsongs"* from the root directory), you would see a listing like this.

```
Volume in drive B has no label
Directory of  B:\MYFILES\HITSONGS

.                    <DIR>           5-18-88      2:26p
..                   <DIR>           5-18-88      2:26p
IGOR          STR        9123        5-18-88      7:29p
MON           SBL        8390        4-15-88      1:25a
RITE          DOC       54018        2-09-88      4:47p
             5 File(s)       454656 bytes free
```

RMDIR:

To remove an unwanted directory, type (for example)

```
rmdir dudsongs
```

after first deleting (see the DEL command explained later) all the files in that directory. A directory containing files cannot be removed.

DOS Commands

MS-DOS commands can be divided into Internal Commands and External Commands.

Internal Commands

Internal commands are part of the system itself, and can be used at any time. The internal commands MKDIR, CHDIR and RMDIR have already been explained. Here are some other basic internal commands.

COPY:

You can copy a file to another file. If desired, the copy can be given a different name, and the disk drive of the source and destination can be specified. For example, by typing

```
copy b:thisfile.abc a:thatfile.xyz
```

a new file `thatfile.xyz` will be created on the disk in drive A, containing the same data as `thisfile.abc` on the disk in drive B. If you leave out the filename of the destination, it will have the same name as the original file. (In this example if the disk in drive B had already contained a file named `thatfile.xzy`, its data would have been lost.)

DEL:

To delete an unwanted file, you would type (for example)

```
del trash.dat
```

In this example, a file named `trash.dat` would be deleted from the disk.

REN:

To rename a file, you would type (for example)

```
ren oldname.doc newname.dat
```

In this example, a file named `oldname.doc` would be renamed `newname.dat`.

External Commands

Files with an extension of .EXE or .COM are external commands. When you type an external command, the file must be read from disk into memory before it can be executed. In the directory display on page 16, you will notice that FORMAT is an external command. The MIDI Monitor program MON.EXE is another external command. Before executing an external command, make sure that the disk in the current drive contains that command file.

There is no need to type the filename extension when executing a command file. For example, if the disk in the current drive contained a program file called SPACEWAR.EXE, you would simply type

```
spacewar
```

and press Enter to run the program.

Some of the external commands included on the system disk are:

FORMAT:
You have already used this to format new disks. If you want to format a new disk to simply hold data, type

```
format b:
```

If you want to format a new disk to be a MS-DOS system disk, type

```
format b:/s
```

This will create a new system disk that you can use to start up MS-DOS. Before a disk can be formatted, its write protect slider must be in the unprotected position (covering the hole). Remember that formatting a disk will erase all data that was on the disk.

DISKCOPY:
This command is used to copy an entire disk to another disk. (If you only need to copy a few files, it is faster to use the copy command to copy the files individually.) For example to copy a disk from drive A to drive B, type

```
diskcopy A: B:
```

(The destination disk does not need to be formatted.)

Other Functions

Some MS-DOS commands (such as DIR) may display more screen output than will fit on one screen. Such output will be "scrolled" up and off the screen to make way for the rest of the output. If it is too fast for you to read, you can Pause the display by holding the CTRL key and pressing Num Lock (Pause). Press any key to resume.

You can abort a partially executed MS-DOS command by holding the CTRL key and pressing Scroll Lock (Break).

The MS-DOS 3.3 included with the C1 has many other commands and possibilities not discussed here. We suggest you study one of the many commercially available textbooks on MS-DOS (version 3.0 or above) to learn what it can do for you.

Turning Off the System

When finished using the C1, exit the program to return to DOS command level (the " > " prompt), wait for all disk access LEDs to go out, remove the floppy disk(s), and then turn the power off.

Hard Disk Models

Hard disk models have a hard disk instead of the lower floppy disk drive. Before a hard disk can be used with MS-DOS, it must be *partitioned* and *formatted*. This section will tell you how to format and partition your hard disk using the FDISK and FORMAT commands.

Note

> *Partioning your hard disk with FDISK will destroy all data on the hard disk. Normally, you will use the entire hard disk for MS-DOS, and run the FDISK program only once, immediately after purchasing the C1.*

FDISK

Insert the system disk in the upper drive and turn the power on to start MS-DOS as explained on page 14. When you get the "A >" prompt, type

    fdisk

and press Enter. The following screen will be displayed

    FDISK Options

    Current Fixed Disk Drive: 1

    Choose one of the following:

    1. Create DOS Partition
    2. Change Active Partition
    3. Delete DOS Partition
    4. Display Partition Data

    Enter choice: [1]

    Press ESC to return to DOS

Press Enter to select choice 1. Next you will be asked

    1. Create Primary DOS Partition
    2. Create Extended DOS Partition

    Enter choice: [1]

Press Enter again to select choice 1. Next you will be asked

```
Do you wish to use the maximum size
for a DOS partition and make the DOS
partition active (Y/N) ........? [Y]
```

Press Enter again to answer Yes. The following message will be displayed.

```
System will now restart

Insert DOS diskette in drive A:
Press any key when ready . . .
```

Make sure that the System disk is in drive A (the upper drive) and press any key. MS-DOS will start up again as usual. The entire hard disk has been partitioned for use with MS-DOS, but it must now be Formatted as follows.

FORMAT

Next you must format the hard disk to accept MS-DOS files. With the system disk in drive A (the upper drive), type
```
format c:/s
```

The following warning will be displayed.

```
WARNING, ALL DATA ON NON-REMOVABLE DISK
DRIVE C: WILL BE LOST!
Proceed with Format (Y/N)?
```

Type "Y" (for Yes) and press Enter to begin formatting. The head and cylinder currently being formatted will be displayed as follows.

```
Head:   0   Cylinder:   0
```

This will take several minutes. When formatting is complete, you will be told the amount of usable disk space.
Since you specified "/s" when you formatted the hard disk, it will contain the hidden MS-DOS system files and COMMAND.COM.

Startup from the hard disk

Now that the hard disk has been formatted and contains the MS-DOS system, you will be able to start MS-DOS from the hard disk (drive C) instead of from a floppy disk (drive A). Since a hard disk is much faster than a floppy disk, startup will be faster. (If the floppy drive contains a floppy disk when the power is turned on, MS-DOS will start up from the floppy disk instead of from the hard disk.)

Hard disk directories

In addition to reading and writing data much faster than floppy disks, hard disks have a much larger capacity. To avoid having to look through hundreds of filenames to find the one you want, we recommend that you create several directories to organize your hard disk as explained in Directories, page 17. For example you might want to make a different directory for each application (sequencing, word processing, etc.).

It is a good idea to make a directory for system files, and copy the system floppy disk to this directory. (Traditional names for the system file directory are "\bin" (short for "binary") or "system".) Making a directory for your system files will help you avoid confusing them with your data files. For example if you have created a directory "\system" in your hard disk, you would put the system floppy disk in drive A, and type

```
copy A:*.* C:\system
```

All files on the system disk will be copied to the hard disk directory "\system".

Data backup

Hard disks are generally quite reliable. However, it is a good idea to regularily make floppy disk copies of important data on the hard disk. Use the COPY command, or consult an MS-DOS manual for more information on the BACKUP and XCOPY commands.

Hard disk precautions

As explained in Front/Rear panel, the Lower Disk in Use LED lights red to indicate hard disk access. The read/write head will remain in position for 5 seconds (LED lights green) and then automatically retract to a safe position (LED off). Since the hard disk is revolving at very high speed, it is vulnerable to physical shocks or heavy vibration. Be especially careful not to bump the C1 while the disk access LED is on. Also, wait for the LED to go off before turning the C1 power off. When transporting the C1, be careful to protect it against rough handling.

System Disk Contents

The following files are on the MS-DOS 3.3 disk included with the C1.

For details on their use, consult a commercially available guide to MS-DOS 3.3.

COMMAND	COM	This program interprets the commands you enter
4201	CPI	Printer parameters for foreign languages
5202	CPI	Printer parameters for foreign languages
ANSI	SYS	Device driver for the ANSI character set
APPEND	EXE	Set a search path for data files
ASSIGN	COM	Assign a different letter as a drive name
ATTRIB	EXE	Modify or display the attributes of a file
BACKUP	COM	Back up files from a hard disk
CHKDSK	COM	Check the directory of a disk
COMP	COM	Compare the contents of two sets of files
COUNTRY	SYS	Device driver (automatically loaded by MS-DOS)
DEBUG	COM	Editing and controlled execution of program files
DISKCOMP	COM	Compare disks
DISKCOPY	COM	Make a copy of an entire disk
DISPLAY	SYS	Device driver to support code page (country- specific) switching for console
DRIVER	SYS	Device driver for external floppy drives
EDLIN	COM	Line editor for text files
EXE2BIN	EXE	Convert executable files to binary format
FASTOPEN	EXE	Speed up access for frequently-used files and directories
FC	EXE	Compare two files and display the differences

FDISK	COM	Divide the hard disk into partitions
FIND	EXE	Search through files for a specified character string
FORMAT	COM	Prepare a disk to be used by MS-DOS
GRAFTABL	COM	Load a table of graphics characters
GRAPHICS	COM	Prepare for graphic screen printout
GWBASIC	EXE	Interpreter for the BASIC programming language
JOIN	EXE	Join a disk drive to a path
KEYB	COM	Load a keyboard program
KEYBOARD	SYS	Device driver (automatically loaded by MS-DOS)
LABEL	COM	Change or delete the volume label of a disk
LCD	CPI	Screen parameters for foreign languages
LINK	EXE	Create an executable program from one or more object files
MODE	COM	Set parameters for screen, communications port, printer etc.
MORE	COM	Display a text file one screen at a time
NLSFUNC	EXE	Load country-specific data from COUNTRY.SYS
PRINT	COM	Send file(s) to the printer (while executing other commands)
PRINTER	SYS	Device driver for code page support for PRN/LPT1, LTP2, LTPT3
RECOVER	COM	Recover a damaged disk or file
RAMDRIVE	SYS	Device driver to create one or more RAM (virtual) drives
REPLACE	EXE	Replace old versions of files
RESTORE	COM	Restore files backed up using the BACKUP command
SELECT	COM	Select the keyboard layout and country code
SHARE	EXE	Install file sharing and locking when using a network
SORT	EXE	Sort a file

SUBST	EXE	Substitute a string for a path
SYS	COM	Copy system files to a disk
TREE	COM	Display the directory structure as a tree
XCOPY	EXE	Copy files and directories
SETUP	COM	Make battery backed-up system settings for the computer.

RAMDRIVE (Configuration File)

When MS-DOS is started, it looks for a file named CONFIG.SYS. If no such file is found, MS-DOS starts up normally, but a file with this name can be created to give MS-DOS special instructions.

Here is an example of how to create a simple CONFIG.SYS file to take advantage of the RAMDRIVE.SYS program included on the system disk.

The RAMDRIVE.SYS program lets part of the C1's memory be used as a "virtual" disk drive that will be much faster than a physical floppy disk.

Caution

> *Since data in the Ramdrive is in memory, it will be lost when the C1 power is turned off. To permanently save files from this Ramdrive, copy the files to a real disk before turning off the system.*

Make sure that the write protect slider on your copy of the system disk is covering the hole, and insert it in drive A. From the system prompt "A > ", type

```
copy con config.sys
```

and press ENTER. "con" is a special filename (device name) used by MS-DOS to indicate the console (the keyboard and display of the C1). What you have just done is to tell MS-DOS to copy your input from the console into a file named config.sys. Type the following line, and at the end of the line, hold down the CTRL key and press "Z", then press ENTER. "^Z" tells MS-DOS that this is the end of the file.

```
device=ramdrive.sys 512 128 64 /E
```

MS-DOS will reply that "one file has been copied".

The first number specifies the size of memory (in Kbytes) occupied by the Ramdrive. The C1 has 512 Kbytes of extension memory, and in this example we will use all of it. The second number specifies the sector size. (You have a choice of 128, 256 or 512 byte sectors, but this is of concern only to technicians.) The third number specifies the number of directory entries allowed in the Ramdrive (2 — 512 files). The "/E" at the end specifies that extension memory is to be used.

Now when you look at the directory of the disk you will notice a new file named CONFIG.SYS containing the line you typed. Next time you start up MS-DOS using that disk, it will read the CONFIG.SYS file and execute the RAMDRIVE.SYS program so that you will have an extra, invisible disk drive available; drive "C". (For hard disk models the RAMDRIVE will be drive "D".) You can copy files to and from it just like an ordinary disk. A Ramdrive does not need to (and cannot) be formatted.

When using a program that frequently reads and writes files, it may save time if you copy all the files you will be using onto the Ramdrive and do your work with the Ramdrive rather than with a floppy disk. Remember to copy Ramdrive files to a real disk before turning the power off.

A CONFIG.SYS file can contain other settings and instructions for MS-DOS. For details, refer one of the many commercially available textbooks on MS-DOS.

DIP Switch Settings

The rear panel of the C1 has 6 DIP switches. When the unit is shipped, all switches are set Off. When using the C1 by itself, there is no need to change these settings, but depending on the optional equipment that is connected, you may need to reset some of them. For the 6 DIP switches, Up is OFF, Down is ON.

SW1: Internal/external display
This determines whether the C1 uses its built-in LCD or an external CRT screen connected to the rear panel display connector. When the external display is selected, the built-in LCD will not be used.

> OFF: Internal LCD
> ON: External CRT (see below)

SW2: External display mode
When you use an external CRT display, set this according to the type of CRT.

> OFF: Color Graphic Display (IBM CGA compatible)
> ON: Monochrome Display (Hercules graphics card compatible)

If you are using an external Monochrome Display, be sure to select Monochrome Display mode. Otherwise, the IBM Monochrome Display may be damaged.

SW3: Disable Music I/O
The C1 uses I/O ports 300h — 31Fh for its music hardware (MIDI and time code, etc.). If special hardware attached to the C1 uses these I/O ports, you will need to disable the C1's music I/O.

> OFF: Music I/O Enable
> ON: Music I/O Disable

SW4: Disable RS232-2
This switch will disable the C1's second RS232C interface.

> OFF: RS232C 2 Enable
> ON: RS232C 2 Disable

SW5: Disable Extended Memory

The C1 has 512 Kbytes of extended memory already installed. This switch will disable the 512 Kbytes of extended memory already installed in the C1.

    OFF: Enable extended memory

    ON: Disable extended memory

SW6: CPU Clock

Normally the C1's CPU runs at 10MHz. This switch will slow the CPU clock to 8 MHz.

    OFF: 10 MHz clock

    ON: 8 MHz clock

MIDI
MONITOR

Introduction

The MIDI Monitor is part of the software supplied with the Yamaha C1 Music Computer. You will find it useful when troubleshooting your MIDI setup. In this manual, we assume you have a basic understanding of MIDI. If not, consult some of the introductory material available both commercially and from manufacturers of musical equipment. (Using the MIDI Monitor can also be a good education in MIDI.) The MIDI Monitor can monitor incoming data, transmit data from the keyboard and sliders, and route data through the two MIDI IN and eight MIDI OUT terminals.

Monitor

Incoming MIDI messages can be viewed either as a stream of data or as a blinking indicator on a grid. Press F7 to switch between monitor modes.

Windows

From the monitor display, press F2 — F8 to open windows for various functions. To return to the monitor display, press ESC.

```
        ┌──────────────┐           ┌──────────────┐
        │ Data Monitor │ ←── F7 ──→│ Map Monitor  │
        └──────────────┘           └──────────────┘

   ┌────┐   ┌────┐   ┌────┐   ┌────┐   ┌────┐   ┌────┐
   │ F2 │   │ F3 │   │ F4 │   │ F5 │   │ F6 │   │ F 8│
   └────┘   └────┘   └────┘   └────┘   └────┘   └────┘
      ↓        ↓        ↓        ↓        ↓        ↓
 ┌──────────┬────────┬──────┬────────┬───────┬────────┐
 │ Patchbay │ Filter │ File │ Symbol │ Dump  │ RS232C │
 └──────────┴────────┴──────┴────────┴───────┴────────┘
```
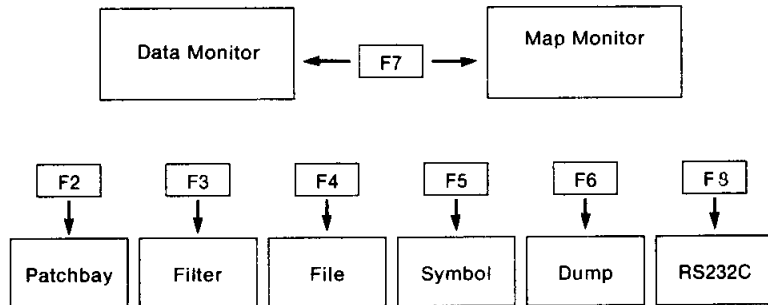
F2 Patchbay:
Messages from the inputs (MIDI IN 1, MIDI IN 2, RS232C) and the C1 keyboard can be transmitted from the outputs (MIDI OUT 1 — 8, RS232C) in any combination. (page 41)

F3 Filter:
The display, MIDI IN 1, MIDI IN 2 and RS232C inputs each have their own filter to remove unwanted messages. (page 42)

F4 File:
Save and load MIDI data symbols in a disk file. (page 50)

F5 Symbol:
Edit the MIDI data symbols you have defined. (page 43)

F6 Dump:
Examine the last 16 kbytes of displayed data. (page 52)

F8 RS232C:
Make settings for the RS232C-1 interface on the rear panel. (page 54)

Help

At any time in any mode or window, you can press F1 or type
>   help
to get an on-screen explanation. Press ESC to leave the help screen.

The Command Line

Wherever there is a command line (a blinking cursor indicating a place to type), you can type in a ...

Command:
This has the same effect as pressing one of the function keys. Good typists may find it faster to type the command than to look for and press the function key. Commands can be abbreviated — for example, by typing
>   he
instead of
>   help
as long as they cannot be confused with a hexadecimal number or another command. Page 55 has a list of commands and their abbreviations.

MIDI data:
Numbers you type in hexadecimal or decimal notation will be immediately transmitted from MIDI OUT as MIDI data bytes. (page 43)

Symbol Definition:
You can define a word (a Symbol) to stand for a string of MIDI data. (page 44)

Symbol:
When you type a Symbol you defined, the MIDI data it stands for will be transmitted from MIDI OUT. (page 44)

When you press the ENTER key, what you have typed will be read. If what you typed was neither a Command, nor MIDI data, nor a Symbol, nor a Symbol Definition, then you will get an error message.

The MIDI Monitor converts all keyboard input to Lowercase characters.

Starting the MIDI Monitor

Make sure that a disk containing the MON.EXE program, the MON.MSG message file and the MON.SBL Symbol file is inserted in the current drive, and type

        MON

from the MS-DOS command level ("A > "). When you press ENTER, the program will be loaded into memory and you will be in the Data Monitor display (page 37).

Exiting the MIDI Monitor

To return to MS-DOS command level, go back to the Monitor display and type

        exit

or press the ESC key.

If you have modified the Symbol file (page 49) and not saved it, you will be asked if you want to save it before you exit. If you press "Y" you will go to the "File F4 Save" window (page 50). After saving the Symbol file you can exit as described below.

If you have not modified the Symbol file or don't want to save it, you will be asked "Exit Monitor Are you sure?" so press "Y" to return to MS-DOS command level.

Setup Files

When you Exit the MIDI Monitor program, a file named MON.STU containing the current settings (file path, RS232C setup, patch bay, filters, slider definitions) will be saved to disk. If the symbol file (MON.SBL) has been changed, you will be asked whether you want to save it. When you start the MIDI Monitor program, these setup files will automatically be loaded, giving you the settings of your previous session.

As already mentioned, the disk must at least contain the two files MON.EXE (the program itself) and MON.MSG (the help messages) for you to use the MIDI Monitor program.

Monitor

**Data Monitor /
Map Monitor**

This is the main display, where you can see the incoming data displayed on the screen. This is where you will be when you start up the MIDI Monitor program.

Incoming MIDI messages can be viewed either as a stream of data or as a blinking indicator on a grid. Press F7 to switch between monitor modes.

The Data Monitor displays each incoming MIDI byte as a hexadecimal number. The Map Monitor briefly displays an "o" to indicate the type of data which has been received. (The lower line of the Map monitor shows the graphic data symbols explained in Format, page 39.)

DATA MONITOR   MAP MONITOR
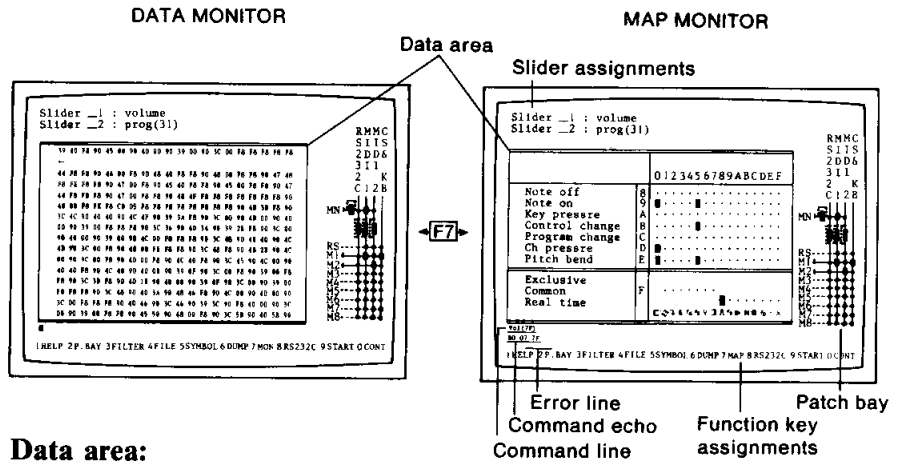
Data area:
The incoming data is displayed here. (See Format and Line Feed, below.)

Command line:
You can type in Commands, define Symbols as MIDI data, or directly enter MIDI data (or Symbols) for immediate transmission.

Command echo:
When you press ENTER after typing into the command line, your command or data will be displayed here.

Error line:
Error messages will be displayed here.

Patch Bay:
This area shows how inputs are connected to outputs. To change Patch Bay settings (page 41), press F2 or type

    patch

Slider assignments:
This shows the current assignment of the two sliders on the C1 keyboard. (page 46)

Function Key assignments:
This shows the commands assigned to the function keys F1 — F10. (These will be different depending on the window you are in. Page 55 has a complete chart of function key assignments.)

Monitor Source and Filters

The Patch Bay settings (page 41) determine which input (MIDI IN 1, MIDI IN 2 or RS232C) you are monitoring. There are four filters to remove data you are not interested in seeing; one filter for the display, and a filter for each of the three inputs; MIDI IN 1, MIDI IN 2 and RS232C. These filters can be bypassed when setting the Patch Bay (page 41), and also from the Monitor display by pressing F1 — F4 while holding down the CTRL key. (The filter status window to the right of the main display will show a bypass line to indicate that the filter is not being used.)

Filter active   Filter bypassed

CTRL + F1 Display filter
CTRL + F2 RS232C filter
CTRL + F3 MIDI IN 1 filter
CTRL + F4 MIDI IN 2 filter

Data Monitor Commands
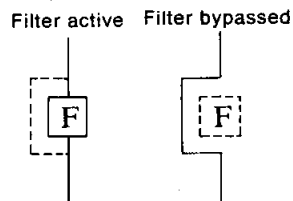
In Data Monitor mode (successive display of incoming MIDI bytes) you can use the following commands to specify how the data is displayed.

Format:

Incoming data is normally displayed as two-digit hexadecimal numbers, with Status Bytes reversed. By pressing CTRL + F (press "F" while holding the CTRL key) you may switch to a special symbolic display in which each MIDI status byte is shown as a graphic character. (These graphic characters are also displayed in the Map Monitor mode.) The channel number will not be displayed, and data bytes will be displayed as the corresponding ASCII character. This can be expecially useful when examining bulk data dumps of voice data, since the voice name will be shown as ASCII characters.

The graphic character for each status byte is as follows.

Data	Message	Data	Message
8n	Note off	F5	Undefined
9n	Note on	F6	Tune request
An	Individual aftertouch	F7	End of exclusive
Bn	Control change	F8	MIDI clock
Cn	Program change	F9	Undefined
Dn	Channel aftertouch	FA	Start
En	Pitch bend	FB	Continue
F0	System exclusive	FC	Stop
F1	MIDI time code	FD	Undefined
F2	Song position	FE	Active sensing
F3	Song select	FF	Reset
F4	Undefined		

The symbols are intended to help you remember the MIDI message they represent. Note off; reversed note. Note on; note. Individual aftertouch; several down arrows (independent sensing). Control change; control slider. Program change; flag. Channel aftertouch; single down arrow. Pitch bend; wheel. System exclusive (beginning and end); square brackets. MIDI time code; a segment of film. Song position; pointer. Song select; segno mark. Tune request; tuning fork. MIDI clock; clock pulse. Start, Continue, Stop; conventional tape deck symbols.

Line Feed:
Normally, data will be displayed using the whole line, but by pressing CTRL + L you can switch Line Feed on, when each message (status byte) will start a new line. This will make the display easier to read. (Status bytes F7 — FF will not start a new line.)

Pause:
As new data comes in, it will overwrite the old data on the screen. By pressing CTRL + S you can Pause the screen display. (Incoming data will continue being written into the input buffer, but will not be displayed.) The upper left of the screen will flash "Pause" and the cursor shape will change to ♦.

Press any key to continue. The data received while you were pausing will be rapidly displayed.

Data Output

While in the Monitor display, you can transmit data by entering numbers or symbols as explained in Symbol, page 43.

MIDI Start /
Stop / Continue

While in the Monitor display, you can transmit a MIDI Start (FAh) message by pressing the F9 key, and alternately transmit a MIDI Stop (FCh) or MIDI Continue (FBh) message by pressing the F10 key. This is useful when controlling drum machines or external sequencers from the C1. (A C1 slider can be used to control MIDI Tempo. See page 47.)

Patchbay

Here you determine how incoming data (received at MIDI IN 1, MIDI IN 2, RS232C) and the C1 keyboard and sliders will be transmitted from the outputs (MIDI OUT 1 — 8, RS232C). From the Main Display, press F2 or type

> patch

to open the Patchbay window.

Use the arrow keys to move the cursor. Press " + " to make a connection. Press " − " to break a connection. Each input may transmit to any combination of outputs. When an output is receiving data from more than one input, the incoming data will be merged. (Incoming System Exclusive messages have priority; when an Exclusive message comes in, other incoming data will be held until the Exclusive message is over.)

The RS232C terminal can be used as either input or output — not both.

Filter Bypass

MIDI IN 1/2, RS232C input and the Monitor each have their own filter. Move the cursor to the switch mark and press " + " to bypass the filter, " − " to enable the filter. (You can also use Ctrl + F1 — F4 to enable or bypass the filters.)

Filter Edit

You can open the Filter Edit window (page 42) by moving the cursor to the "F" mark for one of the filters and pressing ENTER.

Restore

Press F2 to restore the condition of the patch bay to what it was when you first opened the Patch Bay window.

Filter

Data coming into MIDI IN 1/2 and RS232C can be filtered so that unwanted data is not displayed or output. From the Monitor Display, press F3 or type

    filter

to open the filter edit window.

There is an independent filter for the display and for each input. Press F3 to select the filter to edit (Display, MIDI IN 1, MIDI IN 2, RS232C). The upper left of the window shows the filter you are editing.

The filter matrix shows which types of data are being filtered out. The top line shows the channel 0 — F (1-16). Use the arrow keys to move the cursor, and use the − / + keys to filter out (indicated by a "x") or pass (indicated by a ".") the data. Pressing F6 will pass or filter an entire row (the selected message for all channels). Pressing F7 will pass or filter an entire column (all messages for the selected channel).

Channel Convert

You can convert any incoming channel to a different outgoing channel. Move the cursor to the "Channel convert" line and use the − / + keys (or 0 — 9 and A — F) to set the output channel. (Press the SPACE key to set a blank space indicating an unmodified output channel.)

Restore

Press F2 to restore the condition of the filter to what it was when you first opened the Filter window.

Filter Bypass

Press Ctrl + F1 — F4 to enable or bypass the four filters (Display, MIDI IN 1, MIDI IN 2, RS232C). You can also do this in the Patch Bay window by moving the cursor and using the − / + keys.

Symbol (Data Output)

Any time there is a command line (in the Monitor display, Dump window or Symbol window) you may enter MIDI data from the keyboard (or move the two sliders). The data will be immediately transmitted from the output specified by the Patch Bay setting.

Data Output and Symbol Output can be done from the Monitor display and Dump window as well as from the Symbol edit window, but we will be explaining these functions as part of the Symbol Edit window (F5).

Note

> *To see what actually happens when you enter data and symbols from the C1 keyboard, we suggest that you connect the rear panel MIDI OUT 1 to the MIDI IN 1, and set the Patch Bay (page 41) so MIDI IN 1 is being monitored and CS & KB are transmitting from MIDI OUT 1. Make sure all other patch bay connections are broken. Data you enter will be re-received and displayed in the monitor display.*

Data Output

Numeric Output

You can enter "raw" MIDI from the C1 keyboard in Hexadecimal or Decimal (a period "." indicates decimal). Separate data bytes with a space or comma. For example, the following two lines of input would transmit the same data;

```
B0 0A 7F      (data bytes in hexadecimal)
B0 10. 127.   (data bytes in decimal)
```

Template

Pressing Shift + TAB will put the last-entered data back in the command line. You can edit this using DEL, INS, BS and the ← → keys, or retransmit it unchanged. This is handy for entering repetitive data.

Symbol Output

Instead of typing each data byte every time you want to transmit a message, you can define a word (up to 12 characters) to represent a string of MIDI data. This lets you output a long and complex MIDI message (or messages) by typing a short symbol. There is no limit to the number of symbols you can define. Symbols are saved along with other settings when you exit the MIDI Monitor program.

Defining a Symbol

A Symbol is a word up to 12 characters long, using A — Z, a — z, 0 — 9 and the underline character "_". (However uppercase letters will be converted to lowercase.) A Symbol may not be a Hexadecimal number or a Command. The following are examples of illegal symbols;

```
aa, f1, 1d, 321          → Numbers
he (help), pa (patchbay)  → Commands
```

To define a symbol, type the symbol name, then an "equals" sign, and the data you want the symbol to stand for. Symbols can be defined using other symbols. For example;

```
keyon=90 40 40
keyoff=90 40 00
note=keyon keyoff        (transmits 90 40 40 90 40 00)
```

If you now delete the
```
keyon
```
symbol and use the
```
note
```
symbol, you will get an error message. You can nest as many symbols as you like to define long symbols. When you redefine an already defined symbol, the old definition is discarded. (To delete a symbol, see F9 Delete, page 48.)

Using a Symbol

You can type in Symbols and data in any combination. For example if you defined
```
vol=b0 07
```
and typed
```
vol 127.
```
the MIDI data "B0 07 7F" would be transmitted.

Variables in a Symbol

A Symbol definition can contain up to 7 variables, declared in parentheses "()". When using a Symbol that contains variables, put the data values inside parenthesis, with multiple variables separated by a space or comma. (Any undefined single alphabetic character can be used as a variable, but remember that a − f will be considered hexadecimal numbers.) For example, if you defined

    on(x)=90 x 40

and typed

    on(3C)

the MIDI data "90 3C 40" would be transmitted. If you omit a variable, it will be given a value of zero, so that simply typing

    on

would transmit the MIDI data "90 00 40".

Arithmetic Operations in a Symbol (+ , −)

A Symbol definition may use addition " + " and subtraction " − ". For example, if you defined

    on(x,y)=90+x y 40

and typed

    on(2,3C),

the MIDI data "92 3C 40" would be transmitted.

Functions in a Symbol (DHL, DLH)

To transmit data values greater than 127 (e.g., the Pitch Bender position 0 − 8192), MIDI uses two 7-bit data bytes. Depending on the type of data and the receiving device, the two data bytes are transmitted as High/Low or Low/High. The MIDI Monitor provides two functions for splitting data into two MIDI bytes. dhl transmits the data as High/Low bytes, and dlh transmits the data as Low and High bytes.

  For example, typing

    dhl(160.)

would transmit the MIDI data "01 20", and typing

    dlh(160.)

would transmit the MIDI data "20 01".

  The parentheses may contain more than one number. Each number will be split and transmitted separately. For example, typing

    dhl(239. 7015. f9)

would transmit six bytes of MIDI data.

For example you might use this function to transmit Pitch Bender data (Low/High). Other data such as System Exclusive parameter changes might be sent as High/Low. Consult the MIDI format for the receiving device.

Slider Data Output

You can assign the C1's two front panel sliders to transmit any type of data. As when defining any other symbol, type

        slider1=

or abbreviate

        sl1=

and then enter the data to be transmitted. For slider data output, you must use square brackets "[ ]" to specify the minimum and maximum data transmitted by the slider, and the resolution (gradations) with which it will be transmitted. For example, defining

        slider1=B0 07 [0 127. 2]

will cause Slider 1 to transmit Control Change 7 (volume) with only even numbered data; 0,2,4,6 .... (This may be desirable to thin out the amount of transmitted data.) By reversing the Min and Max values, you can make the slider transmit lower data as it is moved forward: e.g.,

        slider1=B0 07 [127. 0 1]

would make a "reversed" volume control that transmits data 127, 126, 125 ...0.
The current definition of Slider_1: and Slider_2: are displayed at the top of the screen.

Preset Slider
Symbols

Frequently used slider symbols are preset for your convenience. For example, you can assign Slider 1 to Control Change 4 (foot controller) by typing

        slider1=foot

Unless otherwise specified, these preset symbols give you a 0 — 127 data range with a resolution of 1. Of course you can redefine any of these, or define your own slider symbols.

The preset control symbol makes the slider transmit the MIDI controller you specify: for example,

        slider2=control(7)

would make the slider control MIDI Volume.

The preset para symbol lets a slider transmit Yamaha System Exclusive parameter changes. Three variables are required; the group "g", parameter number "p", and the data range "n". These will be different for each device. For example, to control the LFO Speed on a DX7, you would assign a slider

        slider1=para(0 9 99.)

Consult the System Exclusive data format for the device you want to control.

There are two special slider symbols; tempo and channel. These symbols will not appear in the list in the Symbol Edit window.

Tempo:
When a slider is defined as (for example)

        slider1=tempo

MIDI Timing Clocks (F8h) will be transmitted at a rate determined by the slider position.

Channel:
When a slider is defined as (for example)

        slider1=channel

the slider will determine the MIDI channel 1 — 16 on which data input from the C1 keyboard and sliders will be transmitted.

Symbol Edit

From the main display, press F5 or type
> symbol

to enter the Symbol window. Here you can view and edit the symbols you have defined. (Several frequently-used slider symbols have already been defined.)

To edit a symbol, use the ↑↓ keys (and PgUp, PgDn keys) to select the symbol you want to edit, and press F2 or type
> edit

The selected symbol will be displayed in the editing area. Edit this using DEL, BS and the ← → keys. The INS key toggles between overwriting (full cursor) and inserting (underline cursor). Pressing ENTER will finalize the changes you have made. If you don't want to change the symbol definition after all, simply select another symbol and press F2.

F3 *Sort*

You can Sort the symbol list in alphabetical order by pressing F3 or typing
> sort

F4 *File*

You can open the Symbol File window (page 50) directly from Symbol Edit without having to return to the Monitor display.

F6 *F7* *Slider*

As a convenience when defining sliders, pressing F6 or F7 will input
> Slider1=

or
> Slider2=

on the command line.

F9 *F10* *Delete*

You can Delete the selected symbol by pressing F9 or typing
> delete

If you are sure you want to delete, press "Y" and the symbol will be deleted. In the same way, you can press F10 or type
> delete all

to delete all symbols.

Symbol Files

When you exit the MIDI Monitor program, you will be asked if you want to save your symbol definitions (see page 36). You can also save or load files of symbols as explained in Symbol File on page 50.

Since these symbol files are in standard ASCII format, you can use a text editing program to edit them. However, make sure that the text editor (word processor, etc.) does not leave any invisible control characters in the file.

If you have a printer attached to your C1 Music Computer, it may be a good idea to print out your symbol file as a handy reference. See the operating manual for your printer or word processor.

File

Here you can save and load Files of symbol data (see Symbol Edit, page 48). From the Monitor display, press F4 or type
        file
to open the File window. If there are more files than can be displayed on the screen at once, use the PgUp and PgDn keys to scroll the display.)

F3 *Load*

To load a file of Symbols from disk, use the arrow keys to select a file and press F3. If you are sure you want to load, press "Y", and the file of symbols will be loaded. This will erase all symbols currently in memory. (When MIDI Monitor is started up, the symbol file named "MON.SBL" will be automatically loaded.)

F4 *Save*

To save the current symbols as a file, press F4. You will be asked for a file name. If you want to save the symbols with the same filename as you loaded, just press ENTER. Otherwise, enter a filename (up to 8 characters) and press ENTER. If you are sure you want to save the symbols, press "Y". (When you exit the MIDI Monitor, all current symbols will be saved as a file named MON.SBL)

F5 *Change Drive*

To see the files on another disk, press F5 and enter the disk drive name A, B. The two floppy disk drives of the C1 will be "A" and "B".

F6 *Change Directory*

To move to another directory (see Directories, page 17) press F6. A list of the directories inside the current directory will be displayed, so move the cursor to the directory you want and press ENTER. If the current directory is itself inside another directory, two dots .. indicate the "parent" directory.

   The current directory is displayed in the lower part of the File window; e.g.
        current directory: A:\
indicates the root directory of drive A. Directories below the root directory will be separated by a backslash character "\". Thus if the root directory of the disk in drive B contained a directory "MYFILES", which itself contained a directory "HITSONGS", the "HITSONGS" directory would be displayed as
        B:\MYFILES\HITSONGS

F7 *Remove Directory*	To remove an unwanted directory (see Directories, page 17) press F7. A list of the disk's directories will be displayed, so move the cursor to the directory you want to remove and press ENTER. If you are sure you want to remove the directory, press "Y" and the directory will be removed. (All files must first be deleted from a directory before it can be removed.)
F8 *Make Directory*	A single disk (especially a hard disk) can accomodate hundreds of files, and finding the filename you need can become timeconsuming. Thus, it is often a good idea to create additional "directories" inside a disk for easier file management. A directory can contain any number of files, or even another directory. Press F8 and enter a new directory name of up to eight characters. Press ENTER, and if you are sure you want to create a new directory, press "Y". The new directory will be created inside the current directory. For details, see Directories, page 17.
F9 *Delete File*	To permanently delete a file from the disk, use the arrow keys to select a file and press F9. If you are sure you want to delete the file, press "Y".
F10 *Find Files*	The lower part of the window shows the type of filename that will be displayed. Symbol files you save will be given an extension of .SBL, and initially, only files with an extension of

.SBL

will be displayed. You can change this by pressing F10 and entering a new file type. A "?" represents any single character, and a "*" represents any character string. For example if you want to see all files of all types, you would specify

.

Specifying

SONG?.*

would display filenames SONG1, SONG2, SONGS SONGX, etc. with any filename extension.

Memory Dump

To enter Memory Dump mode from the Monitor display, press F6 or type

    dump

Here you can see what has been received (passing through the display filter, page 42) up to 16 KBytes ago. Data is displayed in the same order as it came in, with the last incoming data (before you entered Dump mode) in the lower right. Use the ↑↓ keys to move line by line. Use the Pg Up and Pg Dn keys to move screen by screen.

The numbers on the left indicate the address of the data in the far left column.

Data reception stops while you are in Dump mode. (Incoming data will be thrown away.) When you leave Dump mode, data reception will begin again, but a sixteen-byte string of FFh will be inserted to mark your place. You can jump to the next sixteen-byte FFh marker by pressing the HOME (toward higher memory) or END (toward lower memory) keys.

Format

As in the Monitor (page 37), you can switch between Hexadecimal and ASCII/Character display by pressing CTRL + F.

F2 *Clear*

To clear the entire dump memory to all "00h", press F2 or type

    clear

If you are sure you want to clear memory, press "Y".

F3 *Find*

You can search for a specified string of MIDI data. Press F3 or type

    find

and enter the data you want to search for. Leave a space or comma between data bytes. When you press ENTER the specified data will be displayed blinking. Press F4 to continue searching for the next earlier occurance of the data.

F9 *Print*

To print out data from the dump memory, press F9 (or type `print` ... as follows). The command line will show `print nn,mm` where `nn` and `mm` are the start and end addresses to be printed. Initially they will be the start and end of the entire dump memory, but you may change these as you wish, using DEL, INS, BS and the ← → keys. Press ENTER, and if you are sure you want to print, press "Y".

Data will be printed sixteen bytes of Hex per line, with the corresponding ASCII characters in the right column. To abort printing, press CTRL + C.

You may also print the data to a file (instead of to the printer). After specifying the start and end addresses of the data, specify a pathname and file name where you want to save the data. A file will be created containing the data in the same format as normally printed. For example, typing

`print 0,2000/a:\myfiles\dumplist.dat`

would create a new file `dumplist.dat` in the directory `myfiles` of drive A. (Directories are explained on pages 17—19.)

Data Output

While in the Dump window, you can transmit data by entering numbers or symbols as explained in Symbol, page 43.

RS232C
Setup

This is where you make settings for the RS232C-1 port. From the Monitor display, press F8 or type

     RS232C

to open the RS232C window.

RS232C is a standard interface found on most personal computers. By routing MIDI data to or from the C1's rear panel RS232C-1 interface, you can set up MIDI communication with other computers.

Use the ↑↓ keys to select the data, and use the − / + keys to change settings.

Baud Rate:
Select from 150 / 300 / 600 / 1200 / 2400 / 4800 / 9600 / 19200.

Data Length:
Select 7 bit or 8 bit.

Stop Bit:
Select 1 bit or 2 bit.

Parity Check:
Select odd, even or no.

This may be a useful way to get MIDI data into a computer that has no MIDI interface.

Function Key Commands

Here are the function key commands for each mode. In the Monitor display and in the Dump and Symbol windows you can type in commands instead of using the function key. Typed commands can be abbreviated as shown by the underlined portion of the command.

Function key assign table

	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
Main	Help	P.Bay	Filter	File	Symbol	Dump	Mon	RS232C	Start	Stop
P.Bay	Help	Restore	---	---	---	---	---	---	---	---
Dump	Help	Clear	Find	Next	---	Jump	---	---	Print	---
Filter	Help	Restore	Select	---	---	Message	Channel	---	---	---
File	Help	---	Load	Save	ChgDrv	ChgDir	RmvDir	MakeDir	DeleteF	FindF
Symbol	Help	Edit	Sort	File	---	Slider1	Slider2	---	Delete	DelAll
RS232C	Help	---	---	---	---	---	---	---	---	---

BULK MANAGER

Introduction

The Bulk Manager is part of the software supplied with the Yamaha C1 Music Computer on the disk labeled "MIDI Monitor" It allows you to store any type of MIDI bulk data on a C1 disk.

This means that you can conveniently centralize data storage. For example, all voice data, rhythm pattern data, etc. for a song can be stored on a single disk.

What is Bulk Data?

Most devices with user-programmable memory (tone generators, synthesizers, rhythm machines, etc.) are able to transmit their internal memory data as a MIDI System Exclusive message from their MIDI OUT terminal. This "Bulk Data" can be received at the MIDI IN terminal of another device of the same type. This means that you can easily transfer memory data from one device to another device, or send and receive data to and from a bulk data storage device such as the C1 Bulk Manager.

Starting and Exiting

Make sure that a disk containing the BULK.EXE program and the BULK.MSG message file is inserted in the current drive, and type

    bulk

from the MS-DOS command level ("A > "). When you press the Enter key, the program will be loaded from disk, and the screen will show a prompt of

    bulk>

indicating that the Bulk Manager is now in control. To exit the Bulk Manager, type

    exit

and you will return to MS-DOS command level (the "A > " prompt).

Note

When the Bulk Manager is started, it looks for a file named BULK.SBL in the same directory. If it is found, the symbol data in BULK.SBL will automatically be loaded. Especially when sending Dump Requests, it is often helpful to define symbols (words) to stand for frequently-used MIDI messages (dump requests, etc.). The symbols you define can be saved as a file, and loaded as needed. See the various commands explained in the following sections for examples of how to use symbols.

To get an idea of what the Bulk Manager can do for you, we suggest you first read the section on Command Files, and look at the examples. Then come back and read the following section Commands, for details of each command.

Commands

In the Bulk Manager, you can use the following commands. Commands can be abbreviated. For example, you may type

        re

instead of

        receive

We have indicated possible command abbreviations by uppercase and lowercase characters in the Format for each command; e.g., REceive.

- Some commands require you to specify a disk filename. To specify a disk filename, put it in "double quotation" marks.
- Other commands allow you to specify MIDI data to be transmitted. Type in MIDI data or Symbols as explained in MIDI Monitor (page 43).
- It does not matter whether you type filenames or commands in uppercase or lowercase letters.

BEEP

Format: BEep

This command makes the C1's internal buzzer sound for a short time. Place it in a command file to tell you when a task is completed, or to prompt you to make some setting or perform some action. See the next section Command Files for an example.

DEFINE

Format: DEFine symbol-name = midi list or symbol name
           or symbol-name = midi list or symbol name

Just as in the MIDI Monitor (page 44), you may define a word (up to 12 characters) to represent a string of MIDI data for use. For example,

        DEFine dx7voice=f0 43 20 09 f7

would define the symbol DX7VOICE to represent a Dump Request message for DX7 32 voice bulk data. See the command RECEIVE for an application of this.

The command word DEFINE may be omitted. Thus, typing

        dx7voice=f0 43 20 09 f7

would have the same effect. For details, refer to the MIDI Monitor section of this manual. However Slider Symbols, DHL and DLH operations do not apply.

DELETE

Format: `DELete symbol name or "filename"`

Delete a symbol (see DEFINE) or a disk file. For example,
    `del dx7voice`
would delete the symbol you defined in the previous example. You can delete all symbols in memory by typing del all. To delete a file from disk, type the filename in double quotation marks. For example,
    `del "dxbrass2"`
would delete a file DXBRASS2 from disk.

EDIT

Format: `EDit symbol name`

Edit a symbol you have defined. For example, if you want to edit the symbol DX7VOICE you defined in an earlier example, type
    `ed dx7voice`
The symbol definition will be displayed as
    `dx7voice=f0 43 20 09 f7`
and you can edit it using the Ins, Del, Bs, and ← → keys. When finished editing, press Enter. (If you decide you don't want to edit the symbol after all, press Ctrl + C.) For details, see the MIDI Monitor section on Symbol Edit (page 48).

EXIT

Format: `EXit`

This command exits the Bulk Manager and returns to MS-DOS. It may be convenient to include this command as the last line of a command file, as in the Command File example in the next section.

HELP

Format: `HElp`

This command will display a help screen explaining the commands of the Bulk Manager.

LOAD

Format: LOad "filename"

Load a file of Symbols. (Not a MIDI bulk data file.) The Bulk Manager and the MIDI Monitor can use each other's symbol files. For example,
load "mon.sbl"
would load the symbol file used by the MIDI Monitor. See the MIDI Monitor section File (page 50).

PAUSE

Format: PAuse message

This command is useful only in Command Files. Use this to prompt yourself to perform some action, such as switch MIDI inputs, or prepare a device to transmit. The PAUSE command will display your "message" (up to an entire line), and then display "Strike a key when ready ..." When you press any C1 key, the next command will be executed. For an example, see the section on Command Files.

RECEIVE

Format: REceive "filename", Rx#(1-2)
or REceive "filename", Rx#(1-2), transmit-data, Tx#(1-8)

When this command is entered, the C1 will wait for a System Exclusive message to arrive at the MIDI IN you specify (Rx# 1 or 2). Many bulk data dumps actually consist of several System Exclusive messages, sent sucessively. When 10 seconds have gone by without any more data being received (or if you press Ctrl + E), reception will stop and the received data will automatically be saved to disk as a file with the name you specify in "filename".
    For example, when you command
        receive "dxbrass2", 2
the C1 will wait for a System Exclusive message to arrive at MIDI IN 2, and store it to disk as a file named DXBRASS2. Now it is up to you to tell your device (tone generator, synthesizer, etc.) to transmit the bulk data you want. (See your owner's manual.)
    If after executing the RECEIVE command, 10 seconds pass without any data arriving, a Time Out Error will occur, and the command will be aborted. You may also abort by pressing Ctrl + C.

Some devices need to receive a Dump Request message in order to transmit bulk data. (See your owner's manual for details.) The RECEIVE command can also send a dump request if necessary. Enter the appropriate dump request message and the C1 MIDI OUT (1—8) from which to transmit it. For example,

        receive "dxbrass2", 2, f0 43 20 09 f7, 7

will transmit the MIDI data "f0 43 20 09 f7" from C1 MIDI OUT 7, wait for a System Exclusive message to arrive at MIDI IN 2, and store it to disk as a file named DXBRASS2.

This is where Symbols come in handy. If we had defined a symbol "dx7data" as in our example for the DEFINE command, we could type

        receive "dxbrass2", 2, dx7data, 7

with the same result. It is very convenient to create a file of dump request symbols for regular use. If this file is named BULK.SBL, it will be automatically loaded when the Bulk Manager is started.

Note

> *Most devices have a Memory Protect switch (or internal setting) which must be Off before they can receive bulk data. Also, most Yamaha devices have a Device Number setting, which must match the device number of the incoming bulk data. For details, see the owner's manual for your device.*

SAVE

Format: SAve "filename"

The symbols currently loaded into memory will be saved as a file with the filename you specify. For example,

        save "bulk.sbl"

would save the current symbols as a file BULK.SBL. (A file with this name will be automatically loaded into memory when the Bulk Manager is started.)

SORT

Format: SOrt

The symbols currently loaded into memory will be sorted in alphabetical order. You may want to do this before Saving the symbols to a file. (This simply makes a symbol file easier for you to read.)

SYMBOL

Format: SYmbol

Display the symbols currently loaded into memory. This command is handy when you have forgotten the symbols you defined. Ctrl + S will pause the display (press any key to continue). Ctrl + C will stop display.

TRANSMIT

Format: TRansmit transmit-data, Tx#(1–8)
or TRansmit transmit-data, Tx#(1–8), time

Transmit the data (either a filename or a symbol or MIDI data) you specify in "transmit-data" from the C1 MIDI OUT you specify in "Tx#".
For example,
    transmit "dxbrass2", 8
will look for a disk file DXBRASS2, and transmit it from the C1 MIDI OUT 8.

A file of bulk data may contain several System Exclusive messages. (See the RECEIVE command.) For reasons explained in the WAIT command, it may be necessary to insert a time wait between each System Exclusive message (i.e., between each F7 and F0). If the receiving device requires a wait time, you may specify it in the same way as with the WAIT command.
For example,
    transmit "dxbrass2",8,10
would insert a 100 msec wait between each System Exclusive message when transmitting the contents of the file DXBRASS2 from C1 MIDI OUT 8.

You can also use this TRANSMIT command to send various MIDI messages to control other devices.
For example,
    transmit f0 43 10 11 07 00 f7, 2
would transmit the MIDI data "F0 43 10 11 07 00 F7" from the C1 MIDI OUT 2, telling a Yamaha TF1 module (in a TX816 for example) connected to the C1 MIDI OUT 2 to switch its memory protect Off. Since the memory protect of a device must be set Off before it can receive bulk data, one use of this TRANSMIT command would be to prepare a device to accept the following data. (As explained in the RECEIVE command, this would be a good place to use a Symbol.)

Another possible use of the TRANSMIT command would be in conjunction with a programmable MIDI Input Selector. Suppose you need to RECEIVE data from more than two MIDI devices. The C1 has only two MIDI INs, but if you have a programmable MIDI Input Selector that accepts Program Change messages, you can TRANSMIT a Program Change message to make the Input Selector connect the MIDI OUT of the desired device to the C1's MIDI IN, and then RECEIVE data from the desired device.

Consult the manuals for your equipment to learn what messages they receive.

WAIT

Format: WAit time

This command is useful only in a Command File (see the following section).

It makes the C1 wait for the length of time specified in "time" (1—65535 in units of 10 msec) before continuing to the next command in the Command File.

For example,

    wait 50

will wait for 500 msec (1/2 a second) and then go on the next command.

Here's why this command is necessary. Many devices can receive several different types of bulk data. For example, the DX7II transmits and receives Voice and Performance data as separate System Exclusive messages. Most of these devices require a short time to process the received data before they are ready to receive another message. If too much data is received too fast, the incoming data will not be received correctly. So, when using a Command File to successively transmitting several files to the same device, it is a good idea to insert a short WAIT between TRANSMIT commands.

The manual for your device will tell you how long a wait is necessary. For an example, see the next section on Command Files.

Note

> *When transmitting files from a floppy disk, the time required to access the disk will usually be a sufficient wait for most devices, and WAIT commands will probably not be necessary. WAIT commands may be necessary when transmitting files from high-speed storage such as RAM disks or hard disks.*

MS-DOS Commands

You can use the following MS-DOS commands while in the Bulk Manager.

CHDIR:
Change directories.
For example,
```
CHDIR HITSONGS
```
would move to a directory inside the current directory named **HITSONGS.**
```
CHDIR \
```
(backslash) would move to the root (highest) directory of the disk.

DIR:
Display the filenames in the current directory.
For example,
```
DIR *.SBL
```
would display all the files with extensions of .SBL

MKDIR:
Create a new directory inside the current directory.
For example,
```
MKDIR MYFILES
```
create a new directory named **MYFILES.**

RMDIR:
Remove a directory that is inside the current directory.
For example,
```
RMDIR MYSONGS
```
would remove the directory **MYSONGS.** (A directory that contains files cannot be removed. You must first delete all files it contains.)
For details, see MS-DOS, pages 17—19.

Command Files

If you frequently TRANSMIT or RECEIVE the same bulk data, you can speed things up by making a Command File for the Bulk Manager. (You can make as many command files as you need—one for each frequently-performed task.)

Use any word processor or text editor to create a file containing commands for the Bulk Manager. Type one command on each line, and make sure that the word processor does not leave any invisible control characters in the file. Then (assuming for this example that your command file is named MYJOBS), from the MS-DOS command level, type

```
BULK < MYJOBS
```

The " < " (less than) symbol tells the Bulk Manager to get its commands from the file MYJOBS.

Command File Example

Here is an example of what can be done by using a Command File with the Bulk Manager. (Of course you will need to adapt this example to your own situation.) In this example we will assume that your MIDI setup is as follows, and that the device numbers for both DX7IIs have been set to "1".
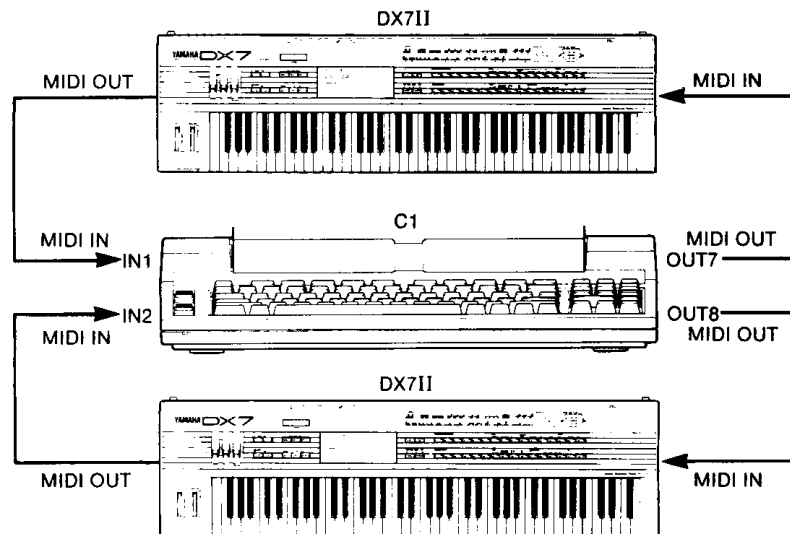
The following Command File example makes use of some of the predefined symbols in the BULK.SBL file. (See the next section, Predefined Bulk Symbols.) Let's call this file SAVEALL. It contains the following commands.

```
pause Save voices and performances from DX7-2 Ok?
transmit dx7_2_vbank(0,1),7
receive "dxvoicea",1,dx7_vo_a(0),7
transmit dx7_2_vbank(0,2),7
receive "dxvoiceb",1,dx7_vo_a(0),7
receive "dxperfa",1,dx7_2_per_m(0),7
transmit dx7_2_vbank(0,1),8
receive "dxvoicec",1,dx7_vo_a(0),8
transmit dx7_2_vbank(0,2),8
receive "dxvoiced",1,dx7_vo_a(0),8
receive "dxperfb",1,dx7_2_per_m(0),8
beep
exit
```

By typing (from the MS-DOS command level)

    BULK < SAVEALL

the Bulk Manager would execute all the above commands.

Line 1: the message " Save voices and performances from DX7-2 Ok?" will be displayed. Make sure that preparations are complete, and press a key to continue.

Line 2: a message switching the DX7II (the 0 indicates Device Number 1) to transmit voice bank 1 (voices 1-32) is sent. (The DX7II receives and transmits voice bulk data in groups of 32 voices.)

Line 3: voice data is requested and stored as a disk file named DXVOICEA.

Line 4: the DX7II is switched to transmit voice bank 2 (voices 33-64).

Line 5: voice data is requested and stored as a disk file named DXVOICEB.

Line 6: performance data is requested and stored as a disk file named DXPERF.

Lines 7-11: the same process is repeated for the DX7II attached to the C1's MIDI OUT 8 and MIDI IN 2.

Line 12: the C1 beeps to let you know that it has finished.

Line 13: the C1 returns to DOS command level, having saved all your data to the C1 disk.

Note

> It will be easier to keep track of your data if you create a directory to hold all Bulk Manager files for a certain song. For example, you might put the following line in the beginning of the command files in this example.
>
> ```
> CHDIR \MYSONG
> ```
>
> This would make the Bulk Manager load and save its disk files inside the directory \MYSONG. For more information on using directories, see pages 17 — 19.

Predefined Bulk Symbols

For your convenience, the BULK.SBL file contains some symbols already defined for use with Yamaha devices. The file BULK-SYM.HLP contains explanations of each predefined bulk symbol. To read BULKSYM.HLP, use any text editor (word processor) program, or type

```
TYPE BULKSYM.HLP
```

from the DOS command level (the " > " prompt).

Consult your owner's manual for details of the System Exclusive format for your device. For example, with minor exceptions, the TX802 and DX7II can use the same voice data. In the same way, the DX11 and TX81Z can also use the same voice data.

You can add to, change, or delete the predefined symbols in BULK.SBL to meet your needs and equipment. See the bulk symbol commands DEFINE, DELETE, EDIT, etc. Your owner's manual will explain the System Exclusive codes for your instrument.

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1. the replacement of any diskette not meeting YAMAHA's "Limited Warranty" and which is returned to YAMAHA or an authorized YAMAHA dealer with a copy of your receipt, or

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You acknowledge that you have read this agreement understand it and agree to be bound by its terms and conditions. You further agree that it is the complete and exclusive statement of the agreement between us which supersedes any proposal or prior agreement, oral or written, and any other communications between us relating to the subject matter of this agreement.

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