

narrator

COLLABORATORS

	<i>TITLE :</i> narrator		
<i>ACTION</i>	<i>NAME</i>	<i>DATE</i>	<i>SIGNATURE</i>
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Chapter 1

narrator

1.1 narrator.doc

```
AbortIO ()
OpenDevice ()
CMD_FLUSH
CMD_READ
CMD_RESET
CMD_START
CMD_STOP
CMD_WRITE
CloseDevice ()
```

1.2 narrator.device/AbortIO

NAME
AbortIO - Abort an IO request

SYNOPSIS
AbortIO (IORequest)
A1

FUNCTION
Exec library call to abort a specified READ or WRITE request. The IORequest may be in the queue or currently active. If currently active, the request is immediately stopped and then removed.

INPUTS
Pointer to the IORequest block to be aborted.

RESULTS
io_Error field in the IORequest block set to #IOERR_ABORTED.

SEE ALSO

1.3 narrator.device/CloseDevice

NAME

CloseDevice - terminates access to the narrator device

SYNOPSIS

```
CloseDevice(IORequest)
    A1
```

FUNCTION

Close invalidates the IO_UNIT and IO_DEVICE fields in the IORequest block, preventing subsequent IO until another OpenDevice. CloseDevice also reduces the open count. If the count goes to 0 and the expunge bit is set, the device is expunged. If the open count goes to zero and the delayed expunge bit is not set, CloseDevice sets the expunge bit.

INPUTS

A valid IORequest block with its io_Message structure, and io_Device and io_Unit fields properly initialized. These fields are initialized by OpenDevice.

RESULTS

CloseDevice invalidates the unit and device pointers in the IORequest block.

SEE ALSO

1.4 narrator.device/CMD_FLUSH

NAME

CMD_FLUSH - Aborts all inprogress and queued requests

SYNOPSIS

Standard device command.

FUNCTION

Aborts all inprogress and queued speech requests.

INPUTS

Valid IORequest block with the `io_Command` field set to `CMD_FLUSH`. A valid IORequest block is one with its `io_Message` structure, and `io_Device` and `io_Unit` fields properly initialized. The easiest way to insure proper initialization is to make a copy of the IORequest block after a successful `OpenDevice` call.

RESULTS

`io_Error` in IORequest block set to 0

SEE ALSO

Exec input/output documentation.

1.5 narrator.device/CMD_Read

NAME

`CMD_READ` - Query the narrator device for mouth shape or other synchronization events.

SYNOPSIS

Standard device command.

FUNCTION

Currently, there are three events which the user can inquire about from the narrator device. These are: mouth shape changes, start of word, and start of syllable. Each read request returns information about any or all of these events as determined by the bits set in the `sync` field of the read IORequest block. In the case of mouth shape changes, each shape returned is guaranteed to be different from the previously returned shape to allow updating to be done only when necessary. Each read request is associated with a write request by information contained in the IORequest block used to open the device. Since the first field in the read IORequest block is a write IORequest structure, this association is easily made by copying the write IORequest block (after the `OpenDevice` call) into the `voice` field of the read IORequest block. If there is no write in progress or in the device input queue with the same pseudo unit number as the read request, the read will be returned to the user with an error. This is also how the user knows that the write request has finished and that s/he should not issue any more reads. Note that in this case the mouth shapes may not be different from previously returned values.

INPUTS

`mouth_rb` IORequest block with the `voice` field (a `narrator_rb` structure) copied from the associated write request with the following fields modified:

- `io_Message` - Pointer to message port for read request
- `io_Command` - `CMD_READ`
- `io_Error` - Clear before issuing first read

width - 0
height - 0

RESULTS

As long as the speech is in progress, each read returns the following information in the mouth_rb IORequest block.

If mouth shape changes are requested the following fields are modified:

width - Contains mouth width value in arbitrary units
height - Contains mouth height value in arbitrary units
shape - Compressed form of mouth shapes (internal use only)

***** NEW FOR V37 NARRATOR

If word synchronization is requested:

sync - Bit NDB_WORDSYNC is set

If syllable synchronization is requested:

sync - Bit NDB_SYLSYNC is set

Note that any or all of the above fields can be set and it is the user's responsibility to check for all possibilities.

SEE ALSO

CMD_WRITE

Exec input/output documentation.

1.6 narrator.device/CMD_RESET

NAME

CMD_RESET - Reset the device to a known state

SYNOPSIS

Standard device command.

FUNCTION

Resets the device as though it has just be initialized.
Aborts all read/write requests whether active of enqueued.
Restarts device if it has been stopped.

INPUTS

Valid IORequest block with the io_Command field set to CMD_RESET.
A valid IORequest block is one with its io_Message structure, and io_Device and io_Unit fields properly initialized. The easiest way to insure proper initialization is to make a copy of the IORequest block after a successful OpenDevice call.

RESULTS

SEE ALSO

Exec input/output documentation.

1.7 narrator.device/CMD_START

NAME

CMD_START - Restarts the device after a CMD_STOP command

SYNOPSIS

Standard device command.

FUNCTION

CMD_START restarts the currently active speech (if any) and allows queued requests to start.

INPUTS

Valid IORequest block with the io_Command field set to CMD_START
A valid IORequest block is one with its io_Message structure, and io_Device and io_Unit fields properly initialized. The easiest way to insure proper initialization is to make a copy of the IORequest block after a successful OpenDevice call.

RESULTS

io_Error set to 0.

SEE ALSO

Exec input/output documentation.

1.8 narrator.device/CMD_STOP

NAME

CMD_STOP - Stops the device.

SYNOPSIS

Standard device command.

FUNCTION

CMD_STOP halts the currently active speech (if any) and prevents

any queued requests from starting.

INPUTS

Valid IORequest block with the `io_Command` field set to `CMD_STOP`. A valid IORequest block is one with its `io_Message` structure, and `io_Device` and `io_Unit` fields properly initialized. The easiest way to insure proper initialization is to make a copy of the IORequest block after a successful `OpenDevice` call.

RESULTS

`io_Error` set to 0.

SEE ALSO

Exec input/output documentation.

1.9 narrator.device/CMD_WRITE

NAME

`CMD_WRITE` - Send speech request to the narrator device

SYNOPSIS

Standard device command.

FUNCTION

Sends a phonetic string to the narrator device to be spoken and, optionally, is used to direct the narrator device to return mouth shape changes, and word and syllable sync events in response to read requests from the user. The phonetic string consists of ASCII characters representing the individual phonemes. Refer to the narrator device chapter of the libraries and devices volume of the ROM Kernel Manual for detailed information.

INPUTS

User IORequest block (struct `narrator_rb` as defined in `.h` file). The `OpenDevice` call will initialize the IORequest block to a "standard male" voice. If you want to change any parms, do so after the `OpenDevice` call and before the `DoIO` (or `SendIO/WaitIO`). For a complete description of the `narrator_rb` structure, see the `narrator.h` or `.i` include file. Note that the `OpenDevice` call does not initialize all the fields needed by the narrator device. The IORequest fields which must be set by the user before issuing the write request are:

- `io_Command` - Set to `CMD_WRITE`
- `io_Data` - Pointer to phonetic string
- `io_Length` - Length of phonetic string
- `ch_masks` - Array of audio channel selection masks (see audio device documentation for description of this field)
- `nm_masks` - Number of audio channel selection masks

***** NEW FOR V37 NARRATOR

flags - The bit NDB_NEWIORB must be set in the flags field if any of the new features of the V37 narrator are used

In addition to producing synthetic speech, the narrator device also provides features for synchronizing the speech to animation or other user defined events. There are three types of events that the user can request. They are mouth shape changes, start of new word, and start of new syllable. Mouth shape changes are requested by setting the mouths field of the IORequest block to a non-zero value. Word and syllable sync events are requested by setting the NDB_WORDSYNC and/or NDB_SYLSYNC bits in the flags field of the IORequest block. Note that word and syllable sync only work in V37 and later versions of the narrator device.

RESULTS

The narrator device range checks and performs other validity checks for all input parms. If any input is in error, the device sets the io_Error field of the IORequest block to an appropriate value (see include files for error codes). If everything is in order, the narrator device will produce the speech and clear the io_Error field. The io_Actual field is set to the length of the input string that was actually processed. If the return code indicates a phoneme error (ND_PhonErr), io_Actual is the NEGATIVE of the position in the input string where the error occurred.

SEE ALSO

Read command.
Audio device documentation.
Exec input/output documentation.

1.10 narrator.device/OpenDevice

NAME

OpenDevice - opens the narrator device.

SYNOPSIS

```
error = OpenDevice("narrator.device", unit, IORequest, flags);  
D0                A0                D0        A1                D1
```

FUNCTION

The OpenDevice routine grants access to the narrator device. OpenDevice checks the unit number, and if non-zero, returns an error (ND_UnitErr). If this is the first time the driver has been opened, OpenDevice will attempt to open the audio device and allocate the driver's static buffers. If either of these operations fail, an error is returned. See the .h and .i include files for possible error return codes. Next, OpenDevice

(done for all opens, not just the first one) initializes various fields in the user's IORequest block (see below). If users wish to use non-default values for these parms, the values must be set after the open is done. OpenDevice also assigns a pseudo unit number to the IORB for use in synchronizing read and write requests. See the read command for more details. Finally, OpenDevice stores the device node pointer in the IORequest block and clears the delayed expunge bit.

***** NEW FOR V37 NARRATOR *****

Several new fields in the IORequest block have been added for V37 narrator. These fields are initialized when the device is opened if the NDB_NEWIORB bit is set in the flags field of the user's IORequest block. Note that NDB_NEWIORB is set in the IORequest block, NOT in the "flags" input parm to the OpenDevice call.

INPUTS

```
device      - "narrator.device"
unit        - 0
IORequest   - Pointer to the user's IORequest block
flags       - 0
```

RESULTS

The narrator device will initialize the IORequest block as follows (assume IORB points to the IOrequest block):

```
IORB->rate = 150; /* Speaking rate in words/minute */
IORB->pitch = 110; /* Baseline pitch in Hertz */
IORB->mode = NATURALF0; /* Pitch (F0) mode */
IORB->sex = MALE; /* Sex of voice */
IORB->volume = 64 /* Volume, full on */
IORB->sampfreq = 22200 /* Audio sampling freq */
IORB->mouths = 0 /* Don't generate sync events */
```

and if the NDB_NEWIORB bit is set:

```
IORB->F0enthusiasm = 0 /* F0 excursion factor */
IORB->F0perturb = 32 /* F0 perturbation (in 32nds) */
IORB->F1adj = 0 /* F1 adjustment in \ensuremath{\pm}5% steps */
IORB->F2adj = 0 /* F2 adjustment in \ensuremath{\pm}5% steps */
IORB->F3adj = 0 /* F3 adjustment in \ensuremath{\pm}5% steps */
IORB->A1adj = 0 /* A1 adjustment in decibels */
IORB->A2adj = 0 /* A2 adjustment in decibels */
IORB->A3adj = 0 /* A3 adjustment in decibels */
IORB->articulate = 100 /* Transition time multiplier */
IORB->centralize = 0 /* Degree of vowel centralization */
IORB->centphon = "" /* Pointer to central ASCII phon */
IORB->AVbias = 0 /* AV bias */
IORB->AFbias = 0 /* AF bias */
IORB->priority = 100 /* Priority while speaking */
```

SEE ALSO

The include files contain the complete IORequest block definition, default settings, and error return codes.
Exec input/output documentation.
