serial

COLLABORATORS

	TITLE : serial		
ACTION	*NAME*	*DATE*	*SIGNATURE*
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REVISION HISTORY

NUMBER	DATE	DESCRIPTION	NAME

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```

1.2 serial.device/AbortIO

```
NAME
    AbortIO(ioRequest) -- abort an I/O request
          A1
```

FUNCTION
    This is an exec.library call.

    This function attempts to aborts a specified read or write request.
    If the request is active, it is stopped immediately. If the request is
    queued, it is painlessly removed. The request will be returned
    in the same way any completed request it.

    After AbortIO(), you must generally do a WaitIO().

INPUTS
    iORequest -- pointer to the IORequest Block that is to be aborted.

RESULTS
    io_Error -- if the Abort succeded, then io_Error will be #IOERR_ABORTED

        (-2) and the request will be flagged as aborted (bit 5 of
        io_Flags is set). If the Abort failed, then the Error will be
        zero.

BUGS
    Previous to version 34, the serial.device would often hang when
    aborting CTS/RTS handshake requests. This was the cause of the
    incorrect assumption that AbortIO() does not need to be followed
    by a wait for a reply (or a WaitIO()).

1.3   serial.device/BeginIO

NAME
    BeginIO(ioRequest),deviceNode -- start up an I/O process
            A1   A6

FUNCTION
    This is a direct function call to the device. It is intended for
    more advanced programmers. See exec's DoIO() and SendIO() for
    the normal method of calling devices.

    This function initiates a I/O request made to the serial
    device. Other than read or write, the functions are performed
    synchronously, and do not depend on any interrupt handling
    logic (or it's associated discontinuities), and hence should
    be performed as IO_QUICK.
    With some exceptions, reads and writes are merely initiated by
    BeginIO, and thusly return to the caller as begun, not completed.
    Completion is signalled via the standard ReplyMsg routine.
    Multiple requests are handled via FIFO queueing.
    One exception to this non-QUICK handling of reads and writes
    is for READS when:
      - IO_QUICK bit is set
      - There are no pending read requests
      - There is already enough data in the input buffer to satisfy
        this I/O Request immediately.
    In this case, the IO_QUICK flag is not cleared, and the request
    is completed by the time it returns to the caller. There is no
    ReplyMsg or signal bit activity in this case.

INPUTS
    ioRequest -- pointer to an I/O Request Block of size
        io_ExtSerSize (see serial.i for size/definition),
        containing a valid command in io_Command to process,
        as well as the command's other required parameters.
    deviceNode -- pointer to the "serial.device", as found in
        the IO_DEVICE of the ioRequest.

RESULTS
    io_Error -- if the BeginIO succeded, then Error will be null.
        If the BeginIO failed, then the Error will be non-zero.
        I/O errors won't be reported until the io completes.

SEE ALSO
     devices/serial.h

1.4   serial.device/CloseDevice

                NAME
    CloseDevice -- close the serial port

SYNOPSIS
    CloseDevice(deviceNode)
                   A1

FUNCTION
    This is an exec call that terminates communication with the
    serial device. Upon closing, the device's input buffer is freed.

    Note that all IORequests MUST be complete before closing.
     If any are pending, your program must
                AbortIO()
                 then WaitIO()
    to complete them.

INPUTS
    deviceNode - pointer to the device node, set by Open

SEE ALSO
    serial.device/OpenDevice

1.5   serial.device/CMD_BREAK

                NAME
    Break -- send a break signal over the serial line

FUNCTION
    This command sends a break signal (serial line held low
    for an extended period) out the serial port. This is accom-
    plished by setting the UARTBRK bit of reg ADKCON. After a

duration (user specifiable via setparams, default 250000
microseconds) the bit is reset and the signal discontinued.
If the QUEUEDBRK bit of io_SerFlags is set in the io_Request
block, the request is placed at the back of the write-request
queue and executed in turn. If the QUEUEDBRK bit is not set,
the break is started immediately, control returns to the
caller, and the timer discontinues the signal after the
duration is completed. Be aware that calling BREAK may
affect other commands such as ABORT, FLUSH, STOP, START, etc...

```
IO REQUEST
    io_Message      mn_ReplyPort initialized
    io_Device       set by
              OpenDevice
                  io_Unit         set by
              OpenDevice
                  io_Command      SDCMD_BREAK
    io_Flags        set/reset IO_QUICK per above description
```

```
RESULTS
    Error -- if the Break succeded, then Error will be null.
        If the Break failed, then the Error will be non-zero.
```

1.6 serial.device/CMD_CLEAR

```
                NAME
    Clear -- clear the serial port buffers
```

```
FUNCTION
    This command resets the serial port's read buffer pointers.
```

```
IO REQUEST
    io_Message      mn_ReplyPort initialized
    io_Device       set by
              OpenDevice
                  io_Unit         set by
              OpenDevice
                  io_Command      CMD_CLEAR
```

```
RESULTS
    Error -- If the Clear succeded, then io_Error will be null.
            If the Clear failed, then the io_Error will be non-zero.
```

1.7 serial.device/CMD_FLUSH

```
                NAME
    Flush -- clear all queued I/O requests for the serial port
```

```
FUNCTION
    This command purges the read and write request queues for the
```

serial device. Flush will not affect active requests.

IO REQUEST
    io_Message   mn_ReplyPort initialized
    io_Device   set by
            OpenDevice
                io_Unit   set by
            OpenDevice
                io_Command   CMD_FLUSH

RESULTS
    Error -- if the Flush succeded, then io_Error will be null.
            If the Flush failed, then the io_Error will be non-zero.

1.8   serial.device/CMD_READ

                NAME
    Read -- read input from serial port

FUNCTION
    This command causes a stream of characters to be read in from
    the serial port buffer. The number of characters is specified
    in io_Length.

    The Query function can be used to check how many characters
    are currently waiting in the serial port buffer. If more characters
    are requested than are currently available, the ioRequest
    will be queued until it can be satisfied.

    The best way to handle reads is to first Query to get the number
    of characters currently in the buffer. Then post a read request
    for that number of characters (or the maximum size of your buffer).

    If zero characters are in the buffer, post a request
    for 1 character. When at least one is ready, the device will return
    it. Now start over with another Query.

    Before the program exits, it must be sure to
            AbortIO()
             then WaitIO()
    any outstanding ioRequests.

IO REQUEST
    io_Message   A mn_ReplyPort is required
    io_Device   set by
            OpenDevice
                io_Unit   set by
            OpenDevice
                io_Command   CMD_READ
    io_Flags   If the IOB_QUICK bit is set, read will try
                     to complete the IO quickly
    io_Length   number of characters to receive.
    io_Data   pointer to buffer

RESULTS
    Error -- if the Read succeded, then io_Error will be null.
        If the Read failed, then io_Error will be non-zero.
        io_Error will indicate problems such as parity mismatch,
        break, and buffer overrun.

SEE ALSO
    serial.device/CMD_QUERY

            serial.device/SDCMD_SETPARAMS
            BUGS
    Having multiple outstanding read IORequests at any one time will
    probably fail.

    Old documentation mentioned a mode where io_Length was set to -1.
    If you want a NULL terminated read, use the io_TermArray instead.

1.9 serial.device/CMD_RESET

            NAME
    Reset -- reinitializes the serial port

FUNCTION
    This command resets the serial port to its freshly initialized
    condition. It aborts all I/O requests both queued and current,
    relinquishes the current buffer, obtains a new default sized
    buffer, and sets the port's flags and parameters to their
    boot-up time default values. The functions places the reset
    parameter values in the ioRequest block.

IO REQUEST
    io_Message   mn_ReplyPort initialized
    io_Device   set by
            OpenDevice
                io_Unit   set by
            OpenDevice
                io_Command   CMD_RESET

RESULTS
    Error -- if the Reset succeded, then Error will be null.
        If the Reset failed, then the Error will be non-zero.

1.10 serial.device/CMD_START

            NAME
    Start -- restart paused I/O over the serial port

FUNCTION
    This function restarts all current I/O on the serial port by

sending an xON to the "other side", and submitting a "logical
xON" to "our side", if/when appropriate to current activity.

IO REQUEST
    io_Message   mn_ReplyPort initialized
    io_Device   set by
                OpenDevice
                    io_Unit   set by
                OpenDevice
                    io_Command   CMD_START

RESULTS

SEE ALSO

                serial.device/CMD_STOP

1.11   serial.device/CMD_STOP

                NAME
    Stop -- pause all current I/O over the serial port

FUNCTION
    This command halts all current I/O on the serial port by
    sending an xOFF to the "other side", and submitting a "logical
    xOFF" to "our side", if/when appropriate to current activity.

IO REQUEST
    io_Message   mn_ReplyPort initialized
    io_Device   set by
                OpenDevice
                    io_Unit   set by
                OpenDevice
                    io_Command   CMD_STOP

RESULTS

SEE ALSO

                serial.device/CMD_START

1.12   serial.device/CMD_WRITE

                NAME
    Write -- send output to serial port

FUNCTION
    This command causes a stream of characters to be written out
    the serial port. The number of characters is specified in
    io_Length, unless -1 is used, in which case output is sent until

```
        a null(0x00) is encountered.

IO REQUEST
    io_Message      must have mn_ReplyPort initialized
    io_Device       set by
              OpenDevice
                    io_Unit         set by
              OpenDevice
                    io_Command      CMD_WRITE
    io_Flags        Set IOF_QUICK to try quick I/O
    io_Length       number of characters to transmit, or if set
                    to -1 transmit until null encountered in buffer
    io_Data         pointer to block of data to transmit

RESULTS
    Error -- if the Write succeded, then io_Error will be null.
        If the Write failed, then the io_Error will be non-zero.

SEE ALSO

                serial.device/SDCMD_SETPARAMS
```

1.13   serial.device/OpenDevice

```
NAME
    OpenDevice -- Request an opening of the serial device.

SYNOPSIS
    error = OpenDevice(SERIALNAME, unit, ioRequest, flags)
    D0                 A0          D0    A1         D0

FUNCTION
    This is an exec call.  Exec will search for the serial.device, and
    if found, will pass this call on to the device.

    Unless the shared-access bit (bit 5 of io_SerFlags) is set,
    exclusive use is granted and no other access to that unit is
    allowed until the owner closes it.  All the serial-specific fields
    in the ioRequest are initialized to their most recent values (or
    the Preferences default, for the first time open).

    If support of 7-wire handshaking (i.e. RS232-C CTS/RTS protocol)
    is required, set the 7WIRE bit in io_SerFlags before opening
    the serial device.

INPUTS
    SERIALNAME      - pointer to literal string "serial.device"
    unit            - Must be zero, or a user setable unit number.
                       (This field is used by multiple port controllers)
                      Zero specifies the built-in serial port.
    ioRequest       - pointer to an ioRequest block of size io_ExtSerSize
                      to be initialized by the serial.device.
                        (see devices/serial.h for the definition)
                        NOTE use of io_SerFlags (see FUNCTION above)
```

```
                IMPORTANT: The ioRequest block MUST be of size io_ExtSerSize !
    flags              - Must be zero for future compatibility
```

RESULTS
```
    D0          - same as io_Error
    io_Error  - If the Open succeded, then io_Error will be null.
                 If the Open failed, then io_Error will be non-zero.
    io_Device - A pointer to whatever device will handle the calls
                for this unit.  This pointer may be different depending
                on what unit is requested.
```

BUGS
```
    If 7-wire handshaking is specified, this enables a timeout "feature".
    If the device holds off the computer for more than about 30-60
    seconds, the device will return the write request with the error
    SerErr_TimerErr.  Don't depend on this, however.  If you want a
    timeout, set up the timer.device and wait for either timer, or serial
    IO to complete.

    On open, the serial.device allocates the misc.resource for the
    serial port.  It does not return it until the serial.device is
    expunged from memory.  It should return it when no more openers
    exist.
```

SEE ALSO
```
    serial.device/CloseDevice
    devices/serial.h
```

1.14 serial.device/SDCMD_QUERY

```
                NAME
    Query -- query serial port/line status
```

FUNCTION
```
    This command return the status of the serial port lines and
    registers. The number of unread bytes in the serial device's
    read buffer is shown in io_Actual.

    The break send & received flags are cleared by a query, and
    whenever a read IORequest is returned with a error
    in io_Error.
```

IO REQUEST
```
    io_Message      mn_ReplyPort initialized
    io_Device       preset by
            OpenDevice
                io_Unit         preset by
            OpenDevice
                io_Command      SDCMD_QUERY
```

RESULTS
```
    io_Status       BIT  ACTIVE  FUNCTION

        LSB         0    ---     reserved
                    1    ---     reserved
```

```
                    2     high    parallel "sel" on the A1000
                                  On the A500 & A2000, "sel" is also
                                  connected to the serial port's
                                  "Ring Indicator".  Be cautious when
                                  making cables.
                    3     low     Data Set Ready
                    4     low     Clear To Send
                    5     low     Carrier Detect
                    6     low     Ready To Send
                    7     low     Data Terminal Ready
          MSB       8     high    hardware overrun
                    9     high    break sent (most recent output)
                   10     high    break received (as latest input)
                   11     high    transmit x-OFFed
                   12     high    receive x-OFFed
                13-15     ---     reserved
```

    io_Actual   set to count of unread input characters

    io_Error -- Query will always succeded.

1.15   serial.device/SDCMD_SETPARAMS

                NAME
    SetParams -- change parameters for the serial port

FUNCTION
    This command allows the caller to change parameters for the
    serial device. Except for xON-xOFF enable/disable, it will
    reject a setparams call if any reads or writes are active
    or pending.

    Note specifically:

    1. Valid input for io_Baud is between 112 and 292000 baud inclusive;
    asynchronous i/o above 32KB (especially on a busy system) may
    be ambitious.
    2. The EOFMODE and QUEUEDBRK bits of io_SerFlags can be set/reset
    in the io_Rqst block without a call to SetParams. The SHARED
    and 7WIRE bits of io_SerFlags can be used in
            OpenDevice
             calls.
    ALL OTHER PARAMETERS CAN ONLY BE CHANGED BY THE SetParams
    COMMAND.
    3. RBufLen must be at least 64.
    4. If not used, io_ExtFlags MUST be set to zero.
    5. xON-xOFF is by default enabled. The XDISABLED bit is the only
    parameter that can be changed via a SetParams call while the
    device is active. Note that this will return the value
    SerErr_DevBusy in the io_Error field.

    xON/xOFF handshaking is inappropriate for certain binary transfer
    protocalls, such as Xmodem. The binary data might contain the
    xON (ASCII 17) and xOFF (ASCII 19) characters.

    6. If trying to run MIDI, you should set the RAD_BOOGIE bit of
    io_SerFlags to eliminate unneeded overhead. Specifically, this skips
    checks for parity, x-OFF handling, character lengths other than
    8 bits, and testing for a break signal. Setting RAD_BOOGIE will
    also set the XDISABLED bit.
    Note that writing data (that's already in MIDI format) at MIDI rates
    is easily accomplished. Using this driver alone for MIDI reads may,
    however, may not be reliable, due to MIDI timestamping requirements,
    and possibility of overruns in a busy multitasking and/or display
    intensive environment.
    7. If you select mark or space parity (see io_ExtFlags in serial.h),
    this will cause the SERB_PARTY_ON bit to be set, and the setting
    of SERB_PARTY_ODD to be ignored.
    8. For best results, set the RAD_BOOGIE flag whenever possible. See
    #6 for details.
    9. Note that at this time parity is *not* calculated for the xON-xOFF
    characters. If you have a system that is picky about the parity of
    these, you must set your own xON-xOFF characters in io_CtlChar.

IO REQUEST
    io_Message   mn_ReplyPort initialized
    io_Device   preset by
              OpenDevice
                 io_Unit   preset by
              OpenDevice
                 io_Command   SDCMD_SETPARAMS (0x0B)
                  NOTE that the following fields are filled in by Open
                  to reflect the serial device's current configuration.
    io_CtlChar   a longword containing byte values for the
                     xON,xOFF,INQ,ACK fields (respectively)
                     (INQ/ACK not used at this time)
    io_RBufLen   length in bytes of input buffer
                      NOTE that any change in buffer size causes the
                     current buffer to be deallocated and a new,
                     correctly sized one to be allocated. Thusly,
                     the CONTENTS OF THE OLD BUFFER ARE LOST.
    io_ExtFlags   additional serial flags (bitdefs in devices/serial.h)
                      mark & space parity may be specified here.
    io_Baud   baud rate for reads AND writes. (See 1 above)
    io_BrkTime   duration of break signal in MICROseconds
    io_TermArray   ASCII descending-ordered 8-byte array of
                     termination characters. If less than 8 chars
                     used, fill out array w/lowest valid value.
                     Terminators are checked only if EOFMODE bit of
                     io_Serflags is set. (e.g. x512F040303030303)
    io_ReadLen   number of bits in read word (1-8) not including parity
    io_WriteLen   number of bits in write word (1-8) "   "   "
    io_StopBits   number of stop bits (0, 1 or 2)
    io_SerFlags   see devices/serial.h for bit equates, NOTE that x00
                     yields exclusive access, xON/OFF-enabled, no
                     parity checking, 3-wire protocol and TermArray
                     inactive.

RESULTS
    Error -- if the SetParams succeded, then Error will be null.
       If the SetParams failed, then the Error will be non-zero.

SEE ALSO
    exec/OpenDevice