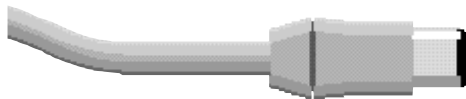


# Texas Instruments Embedded LynxSoft Software Solutions

Danny Mitchell  
Texas Instruments  
1394 Software Manager

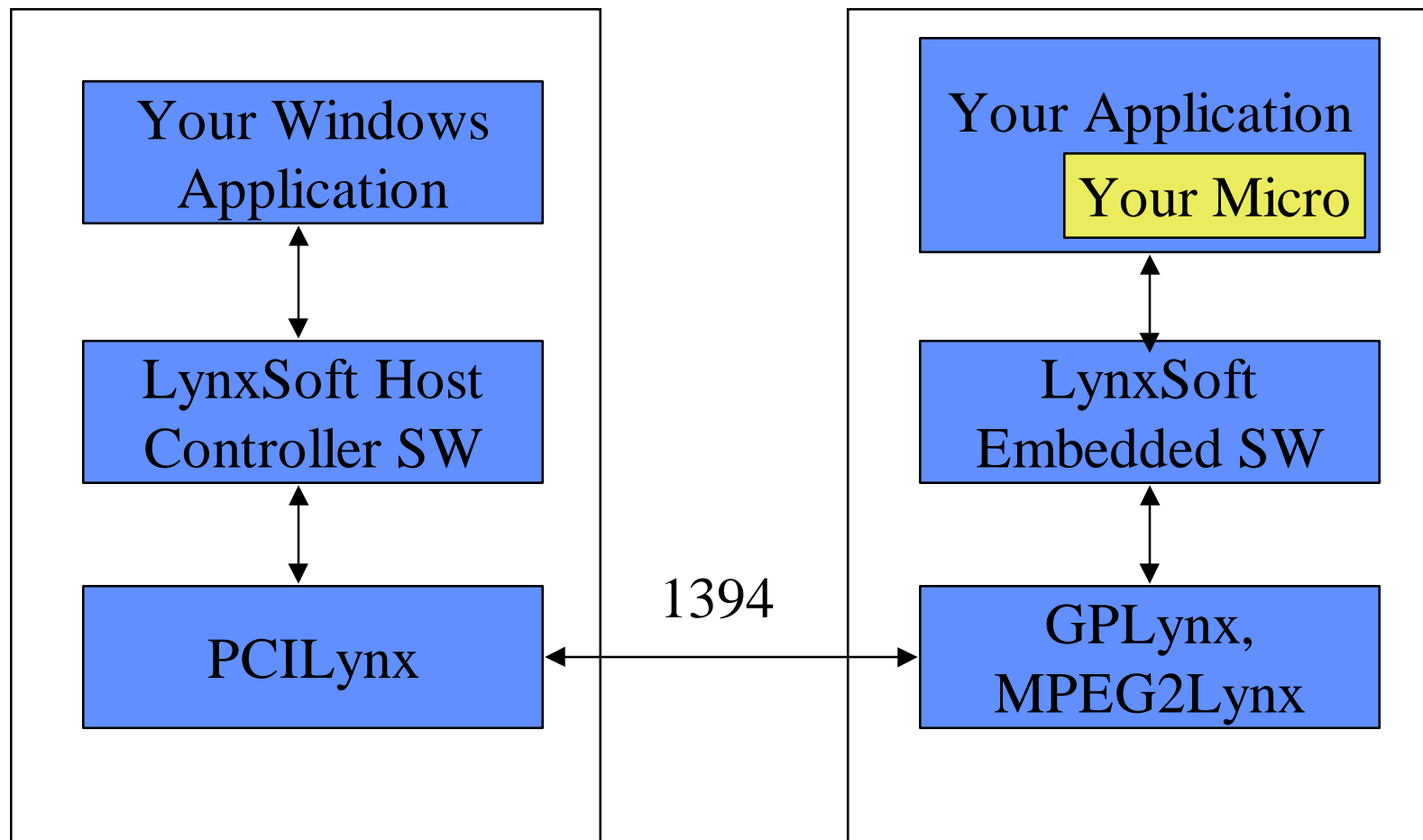


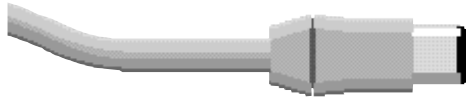


# Texas Instruments LynxSoft Software Solutions

PC

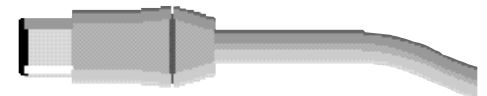
1394 Device

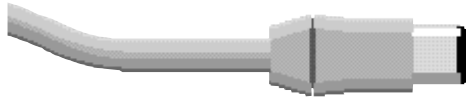




# Texas Instruments Embedded Controller EVM Kits and Software Drivers

- GPLynx and MPEG2Lynx Evaluation Kits
- Texas Instruments DSP controller on the GPLynx evaluation kit.
- Complete 1394 solution for your development needs.
- Ability to connect your controller to the MPEG2Lynx EVM kit for software and hardware development.
- Bus Management, Isochronous Resource Management and Transaction Layer software.
- Software designed for portability.

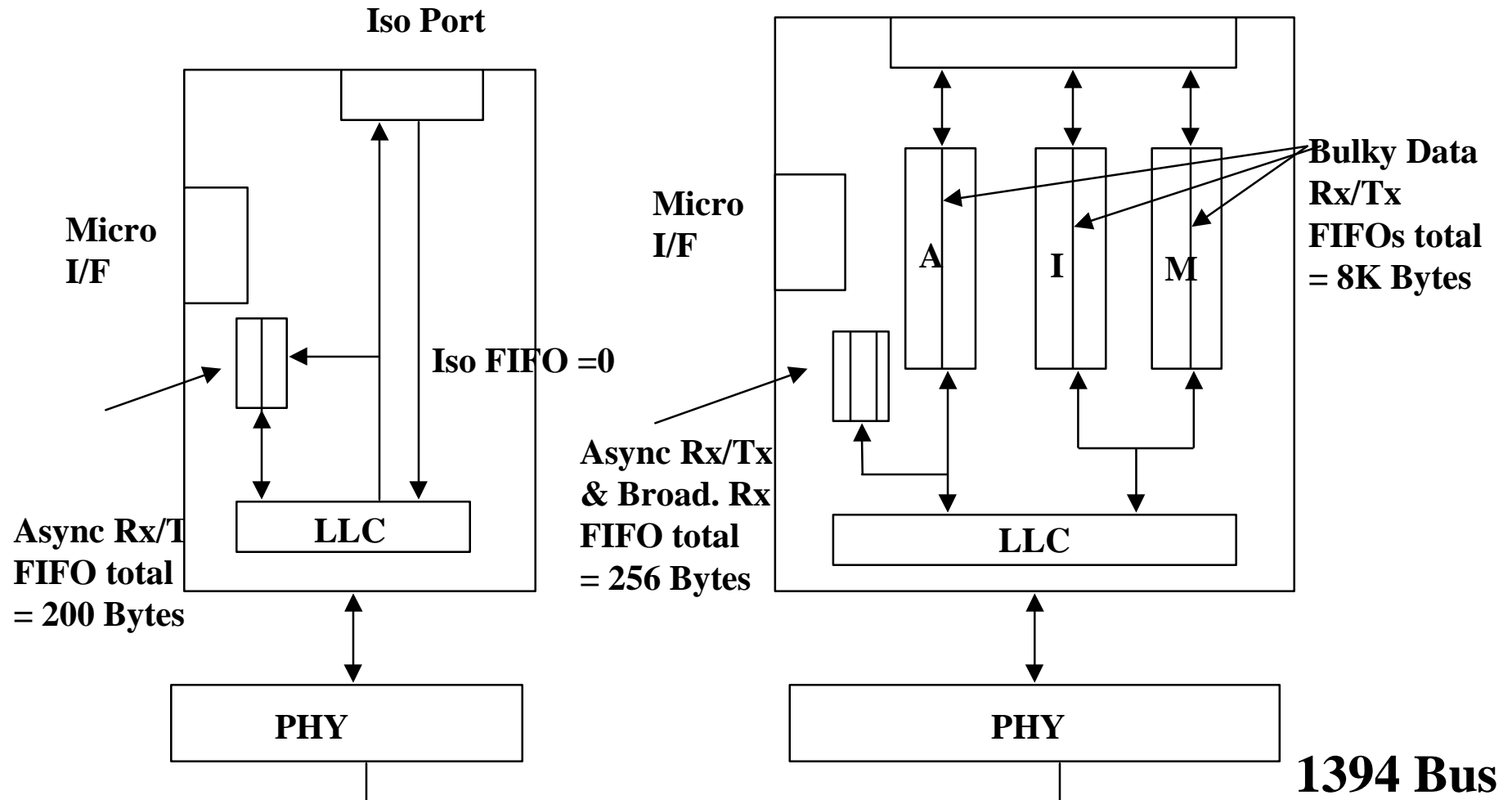




# Software View Of Hardware

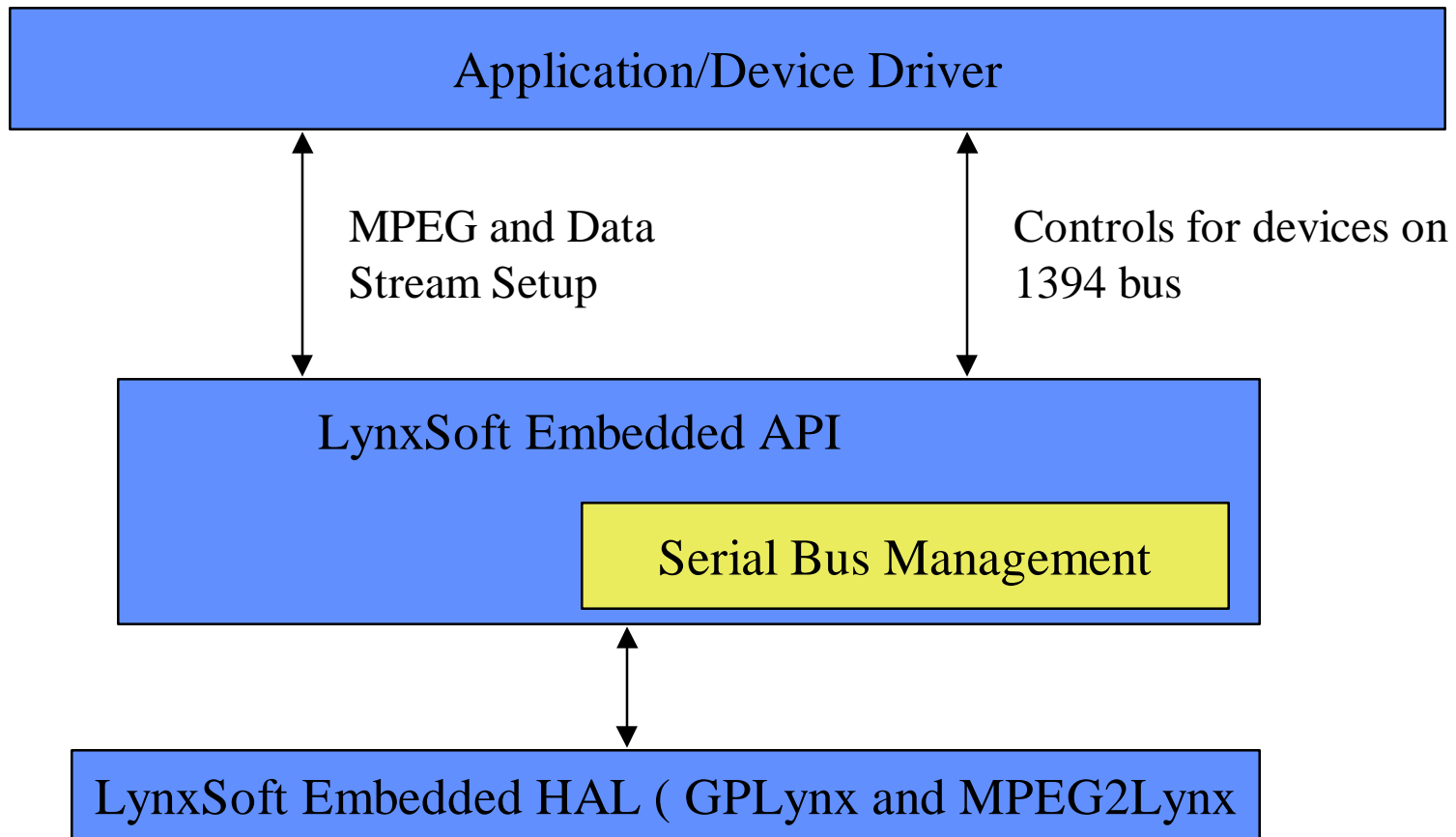
**GPLynx**

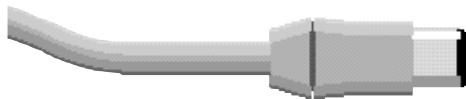
**MPEG2Lynx**



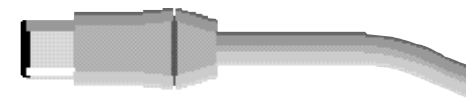
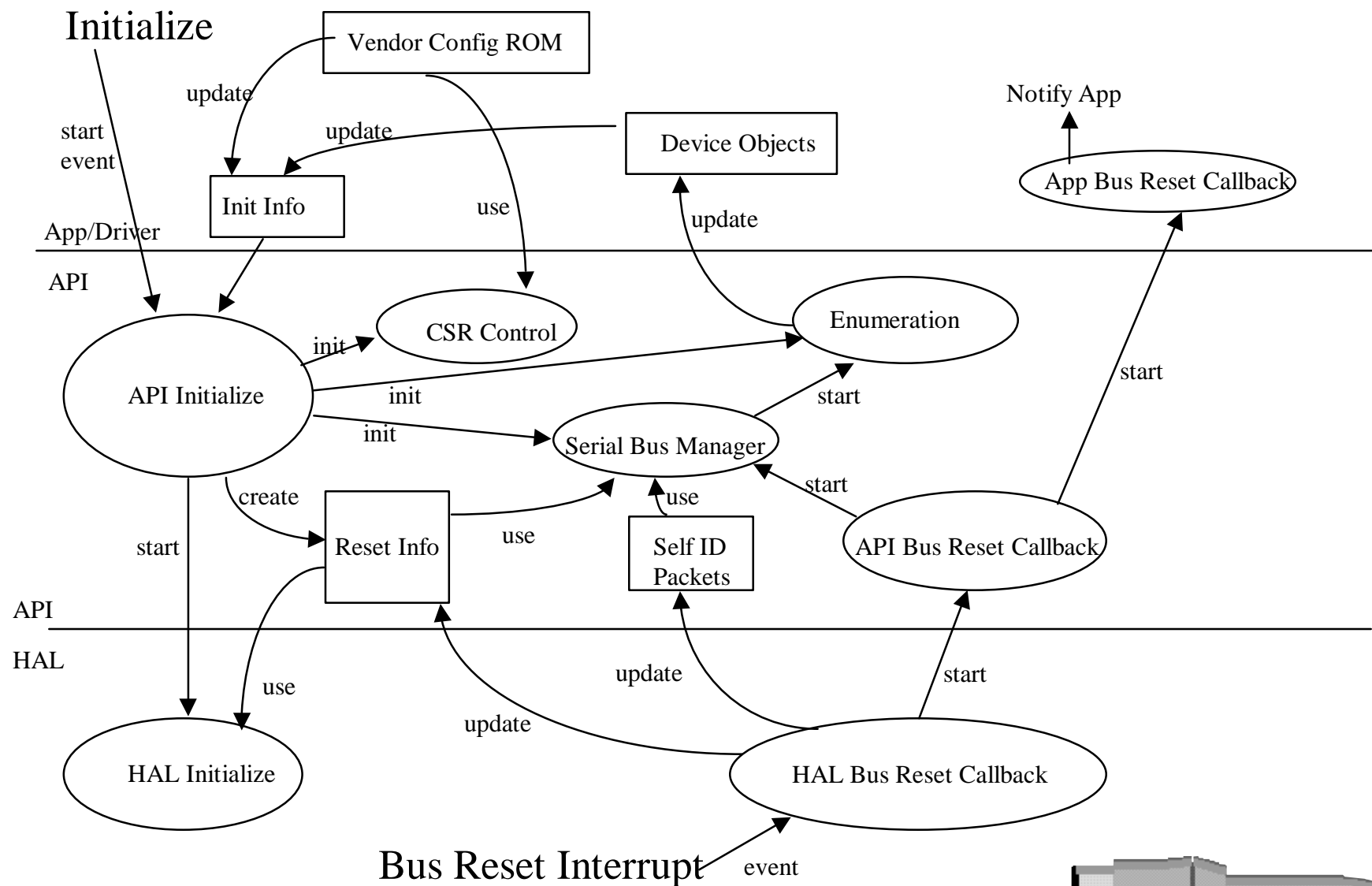


# Software Hierarchy

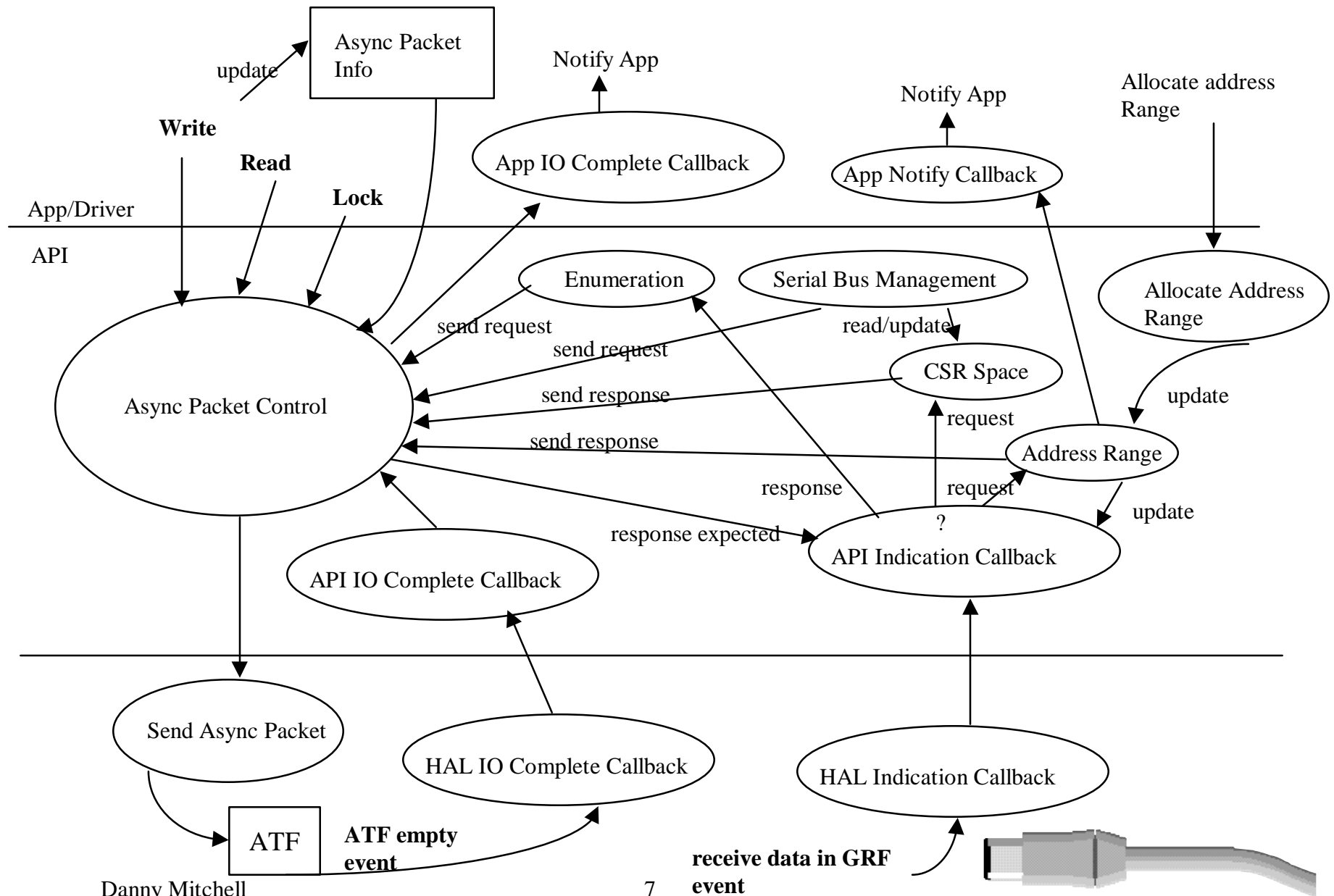


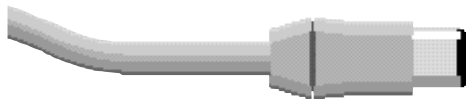


# Embedded LynxSoft - Initialize and Bus Reset

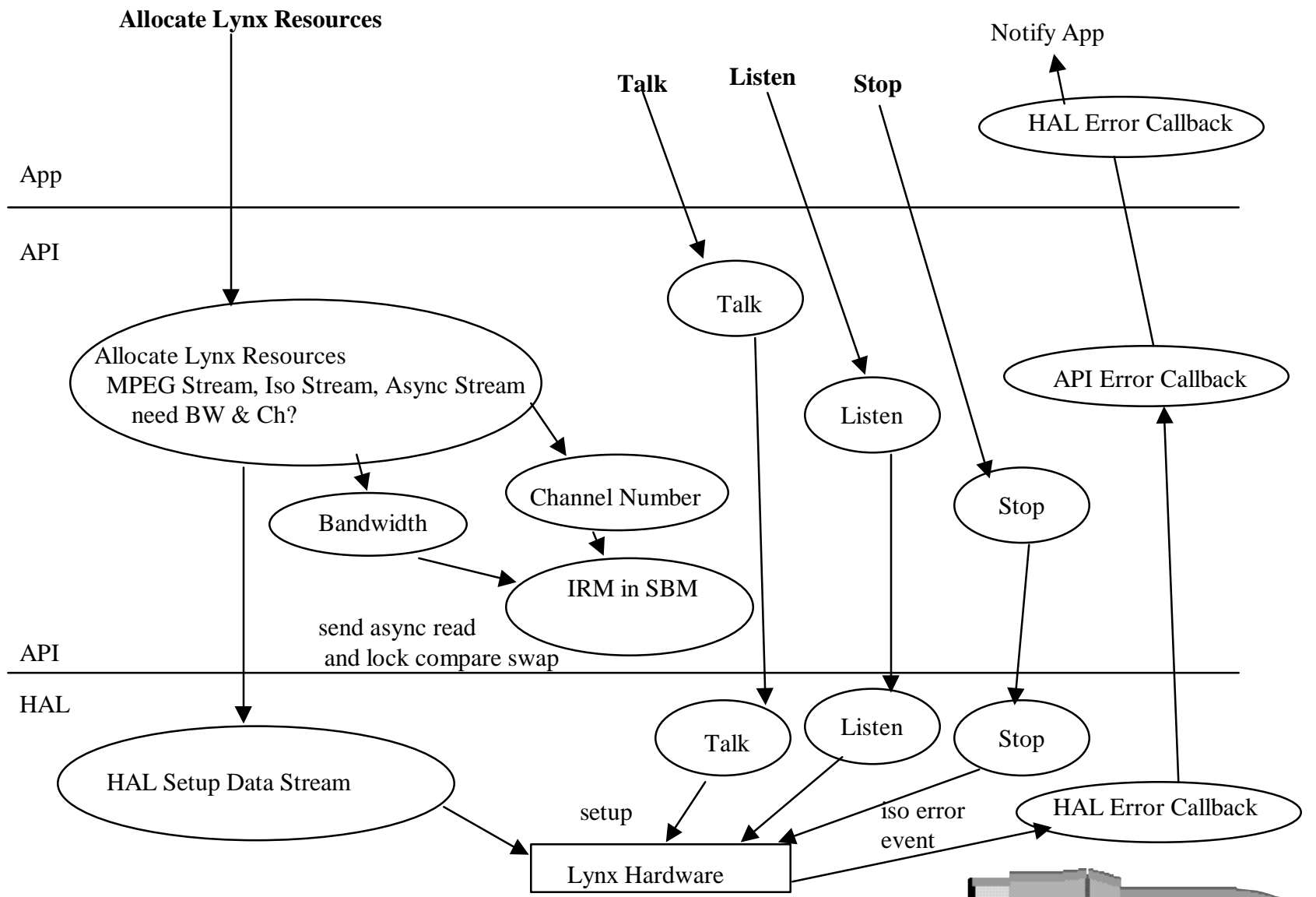


# Embedded LynxSoft Async Send and Receive

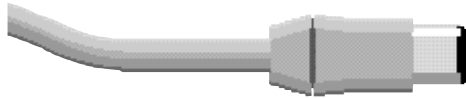




# Embedded Lynx Data Streams



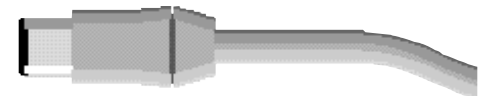


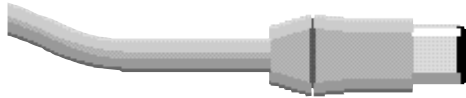


# API Isochronous Sequence

- The API calls and the sequence required for setting up an Isochronous stream is shown below.

| Operation                | Result  |
|--------------------------|---|
| sbiInitialize            | Initialize LynxSoft API software and Lynx Hardware                |
| sbiAllocateLynxResources | Setup the Lynx device to send/receive the expected data           |
| sbiStreamListen          | Begin the receive operation                                       |
| sbiStreamTalk            | Begin the transmit operation                                      |
| sbiStreamStop            | Halt/Pause the transfer. Must be done before sbiFreeLynxResources |
| sbiFreeLynxResources     | Free the allocated Lynx resource                                  |
| sbi1394Terminate         | Shut down the 1394 interface if no more 1394 operations           |



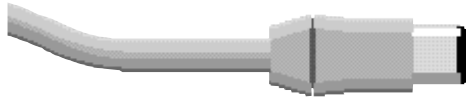


# API Asynchronous Sequence

- The API calls and the sequence required for performing Asynchronous communications is shown below.

| Operation  | Result   |
|--|--|
| sbiInitialize                                      | Initialize LynxSoft API software and Lynx Hardware   |
| sbiAllocateAddressRange                            | The LynxSoft API requires the application software to provide a buffer to handle asynchronous traffic. The application software can read/write to any CSR 1394 address space that has been made available by the target device. In the case of another LynxSoft API, the target device must have allocated their address range for writing.. |
| sbiAsyncWrite,<br>sbiAsyncRead, or<br>sbiAsyncLock | The application software can read/write to any CSR 1394 address space that has been made available by the target device. In the case of another LynxSoft API, the target device must have allocated their address range for writing.   |
| sbiFreeAddressRange                                | Free the allocated address range.  |
| sbi1394Terminate                                   | Shut down the 1394 interface if no more 1394 operations are required.  |

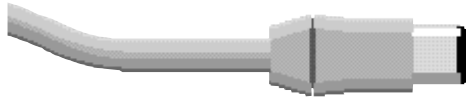




# API General and Test Functions

| Operation                 | Result  |
|---------------------------|---|
| sbiPresentStatus          | Returns status of Lynx LynxSoft API   |
| sbiPresentLynxVersion     | Returns LynxSoft SW version number and silicon version number   |
| sbiPresentTopologyMap     | <b>Test Only</b> - Returns a pointer to the Topology Map  |
| sbiPresentSpeedMap        | <b>Test Only</b> - Returns a pointer to the Speed Map   |
| sbiReadThisNodesCSRSpace  | Read the CSR space of this node   |
| sbiWriteThisNodesCSRSpace | Write to the CSR space of this node.  |
| sbiLockThisNodesCSRSpace  | Cause a Lock operation on this nodes' CSR space.  |
| sbiSendLinkOn             | <b>Test Only</b> - Send PHY layer packet.   |
| sbiSendPhyConfig          | <b>Test Only</b> - Send PHY layer packet.   |
| sbiPresentGapCount        | <b>Test Only</b> - If node is Bus Manager, returns calculated Gap Count. If this node is NOT Bus Manager, it returns Gap Count from PHY register.                 |
| sbiCauseBusReset          | <b>Test Only</b> - Caller should use Initialize. This function causes a bus reset to occur. This will cause the LynxSoft API to go through the bus reset process. |

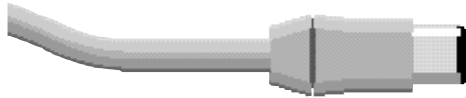




# Entry points into HAL

| Function                | Comment                                   |
|-------------------------|---|
| LynxHALInit             | Initialize the HAL sub-system             |
| LynxHALTerminate        | Disable callbacks, disconnect interrupts. |
| LynxHALSendAsyncPacket  | Send Async transaction packet             |
| LynxHALSendPhyPacket    | Send PHY packet                           |
| LynxHALSaveAsyncPacket  | Remove and save Async packet in GRF       |
| LynxHALBusyOff          | Used to throttle incoming Async packets   |
| LynxHALStartCycleMaster | Used if node is to be Cycle Master        |
| LynxHALTalk             | Start Transmit data stream                |
| LynxHALListen           | Start Receive data stream                 |
| LynxHALStop             | Stop Transmit or Receive data stream      |
| LynxHALPresentVersion   | Returns SW and HW version                 |
| LynxHALPresentGapCount  | Returns the Gap Count                     |
| LynxHALCauseBusReset    | Generates a bus reset                     |
| LynxHALGetThisNodesID   | Returns this node's Self ID packet        |
| LynxHALGetCycleTime     | Returns Cycle Timer Register              |
| LynxHALGetBusID         | Returns Bus ID                            |
| LynxHALSetBusID         | Set Bus ID                                |
| LynxHALNodeISR          | Interrupt Handler                         |

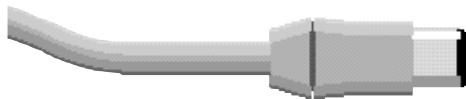




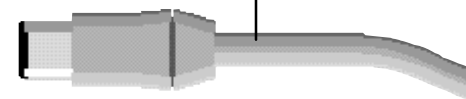
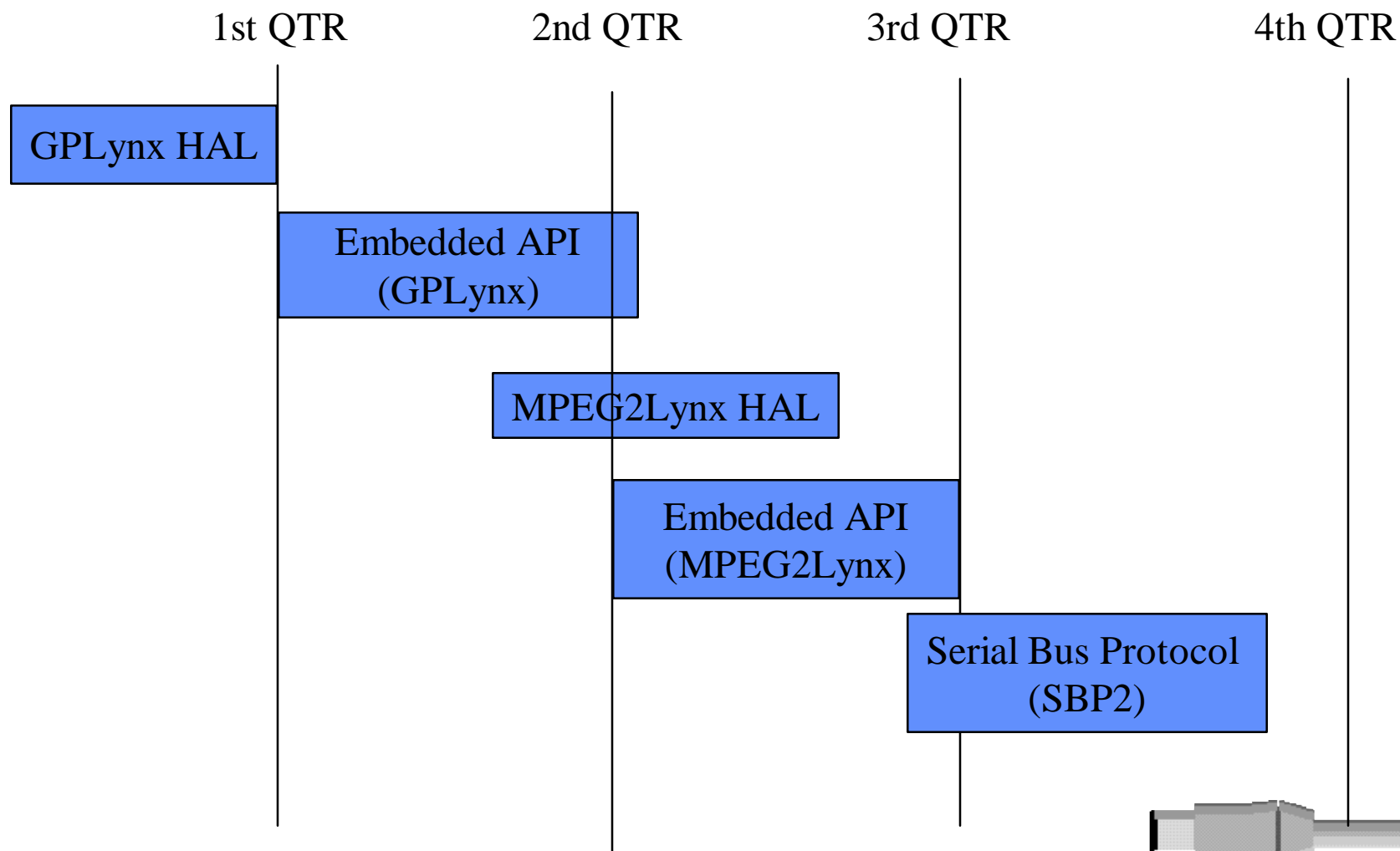
## Entry points into HAL (cont.)

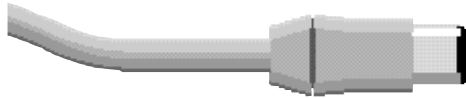
| Function                     | Comment   |
|------------------------------|---|
| LynxHALAllocateLynxResources | <b>MPEG2Lynx Only</b> - Setup bulky data streams M/D, I, A      |
| LynxHALBusResetCallback      | Handles bus resets  |
| LynxHALIoCompleteCallback    | Async packet sent to the bus                                    |
| LynxHALIndicationCallback    | Incoming Async packets  |
| LynxHALErrorDetectedCallback | Isochronous cycle conditions that cause packets not to be sent. |





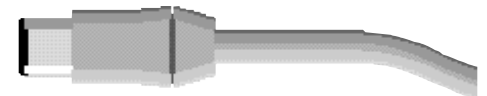
# TI 1394 EMBEDDED SOFTWARE ROADMAP

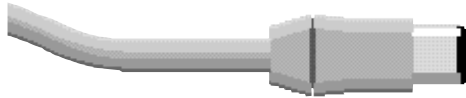




## *Texas Instruments Software Solutions*

- Provide our customers a total solution with mature industry leading silicon and complete software support.
- Provide both your host controller and embedded system solution needs.
- Software is written in ANSI C and designed to provide maximum portability.
- Embedded solutions are designed to be controller independent.
- HAL software available as a reference guide for your own low-level development.
- Upper level API and Bus Manager software available.
- Texas Instruments software support is dedicated to enabling your 1394 product get to market faster and with less risk.





## *Where to get more information*

- <http://www.firewire.org>
  - 1394 Trade Association Web Page
- <http://www.ti.com/sc/1394>
  - Texas Instruments Web Page
- IEEE 1394-1995 Standard (800)678-IEEE
- Danny Mitchell [DMitchell@ti.com](mailto:DMitchell@ti.com)
  - 972-480-3411

