

**X3T10/95-234r0**

**Project Proposal  
For a New  
X3 Standard**

**Serial Storage Architecture  
Physical Layer 1  
(SSA-PH1)**

**March 31, 1995**

## 1. IDENTIFICATION OF PROPOSED PROJECT

1.1 **TITLE:** Serial Storage Architecture - Physical Layer 1 (SSA-PH1).

1.2 **PROPOSER:** X3T10.

1.3 **DATE SUBMITTED:** May 9, 1995

1.4 **PROJECT TYPE: D** - Development of a standard within an X3 TC.

## 2. JUSTIFICATION OF PROPOSED STANDARD

### 2.1 NEEDS:

The Serial Storage Architecture fills a need in the evolution from parallel to serial interfaces for storage devices. It meets the space constraints and cabling considerations for high-density storage arrays with a commensurate improvement in reliability and configurability.

The reliability improvements are derived from an architected error recovery, redundant paths to devices, a wrap mode for self-test, line fault detection and a balanced signalling scheme that achieves a low error rate.

The configurability results from the ability to hot-plug devices, the self-configuration capability, the 10 meter length of cable segments.

The physical layer requires a CMOS implementation to achieve an economical and small package size. An efficient use of bandwidth, a small frame size to reduce buffer expense and the capability for self-configuration are also needed. The physical requirements include 10 meter distance per cable segment, a small number of signals to limit connector and cable expense, and a low voltage implementation.

### 2.2 RECOMMENDED SCOPE OF STANDARD:

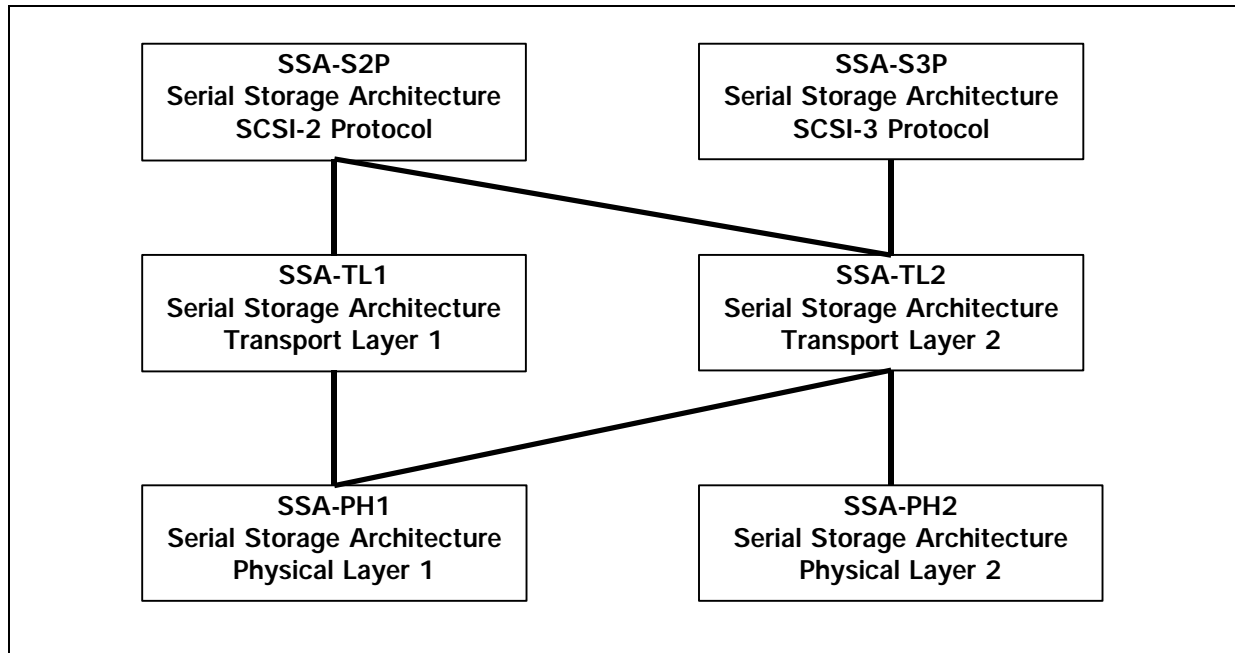
The SSA-PH1 standard will define a physical layer that will support the SSA transport layer and the protocol above it.

The goals of SSA-PH1 are:

- a) minimize gate count.
- b) copper cable operation at 20MB/sec.
- c) full duplex operation to achieve an aggregate 40MB/sec between two ports.
- d) line fault detector for links.
- e) connectors and cables sized for small form factor devices.

### 2.3 EXISTING PRACTICE IN AREA OF PROPOSED STANDARD:

The SSA-PH1 standard is part of an evolving family of standards related to the Serial Storage Architecture. There are implementations of this architecture based on work done in the SSA User Industry Group.



#### 2.4 EXPECTED STABILITY OF PROPOSED STANDARD WITH RESPECT TO CURRENT AND POTENTIAL TECHNOLOGICAL ADVANCE:

This standard provides a physical layer definition for a 20MB/sec serial interface, while preserving the capability to transport SCSI command and status information.

### 3. DESCRIPTION OF PROPOSED PROJECT:

3.1 TYPE OF DOCUMENT: Standard.

3.2 DEFINITION OF CONCEPTS AND SPECIAL TERMS: None.

#### 3.3 EXPECTED RELATIONSHIP WITH APPROVED X3 REFERENCE MODELS:

The SSA-PH1 standard is intended for use in closed systems.

#### 3.4 RECOMMENDED PROGRAM OF WORK:

The following program of work is planned for the SSA-PH1:

- (1) Solicit continuing participation by the current membership of X3T10.1 through X3 procedures. Invite comments by end-user organizations (i.e., SSA-UIG) and invite proposals from organizations that may have a contribution to an SSA-PH1 standard.
- (2) Establish functional requirements for SSA-PH1.
- (3) Prepare a draft proposed standard based on proposals submitted and other information gathered during the initial investigation.
- (4) Consider the results of SSA-PH1 testing as may be available to the committee through the voluntary efforts of the X3T10.1 membership.
- (5) Submit the draft proposed standard to X3 for further processing.

**3.5 RESOURCES - INDIVIDUALS AND ORGANIZATIONS COMPETENT IN SUBJECT MATTER:**

The current membership of X3T10.1 includes representatives from all parts of the computer industry, from semiconductor chip manufacturers to large mainframe system manufacturers as well as government agencies. The members of X3T10.1 have expressed their desire to participate and cooperate in the development of this proposed standard.

There are sufficient resources to complete the development of this standard without delaying work on other projects.

**3.6 RECOMMENDED X3 DEVELOPMENT TECHNICAL COMMITTEE:**

It is recommended that the development work be done in Task Group X3T10.1 of Technical Committee X3T10 which is responsible for developing the family of Serial Storage Architecture standards.

**3.7 ANTICIPATED FREQUENCY AND DURATION OF MEETINGS:**

Technical Committee X3T10.1 meets for one day bi-monthly. Specific task ad hoc groups are called as may be required for one to three days between the regular meetings but their results are not binding.

**3.8 TARGET DATE FOR DPANS TO X3: August 1996.****3.9 ESTIMATED USEFUL LIFE OF STANDARD:**

It is anticipated that this standard will have a life of less than 5 years.

**4. IMPLEMENTATION IMPACTS****4.1 IMPACT ON EXISTING USER PRACTICES AND INVESTMENTS:**

The proposed SSA-PH1 standard will provide an initial implementation point complementary to the existing practices and investments. It is likely that any isolated negative impacts would occur in any case through non-standard evolution or revolution.

**4.2 IMPACT ON SUPPLIER PRODUCTS AND SUPPORT:**

The proposed SSA-PH1 standard will provide an initial implementation point complementary to the existing practices and investments. It is likely that any isolated negative impacts would occur in any case through non-standard evolution or revolution.

**4.3 TECHNIQUES AND COSTS FOR COMPLIANCE VERIFICATION:**

The committee will consider the results of SSA-PH1 testing as may be available to the committee through the voluntary efforts of the various participants in X3T10.1. With this method all costs are borne by the organizations of the various participants and have for the most part been mainly an adjunct of their normal development costs.

**4.4 LEGAL CONSIDERATIONS:**

There are no known legal considerations other than an IBM patent on the 8B/10B coding scheme, which IBM has agreed to license in accordance with the ANSI patent policy. A Call for Patents will be made.

## 5. CLOSELY RELATED STANDARDS ACTIVITIES

### 5.1 EXISTING STANDARDS:

X3.131-1994 -- SCSI-2

### 5.2 X3 STANDARDS DEVELOPMENT PROJECTS:

SSA-TL1 -- Project 0989-D

SSA-S2P -- Project 1121-DT

SSA-S3P -- Project 1051-D

### 5.3 X3 STUDY GROUPS: None.

### 5.4 OTHER RELATED DOMESTIC STANDARDS EFFORTS: None.

### 5.5 ISO/IEC JTC 1 STANDARDS DEVELOPMENT PROJECTS: ISO/IEC 9316-1 (SCSI-2). It is anticipated that SSA-PH1 will be proposed to JTC1/SC25/WG4.

### 5.6 OTHER RELATED INTERNATIONAL STANDARDS DEVELOPMENT PROJECTS: None.

### 5.7 RECOMMENDATIONS FOR COORDINATING LIAISON: None.

### 5.8 RECOMMENDATIONS FOR CLOSE LIAISON: None.