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Final Report on the Project
for Development of New
Protocol Hardware and Software
for LSI-11 to Accommodate
AUTODIN II ADCCP-HDLC, and X.25

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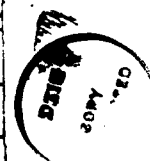
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BACKGROUND

ACC produces a plug-in microprocessor for the PDP-11 UNIBUS, referred to as the UMC, which has been programmed to operate as an X.25 controller (levels 1, 2, and 3). ACC has an I/O driver for this X.25 controller for use on the RSX-11M operating system.

ACC also produces a Multi-Channel Direct Memory Access (MDMA) controller for the LSI-11. The MDMA allows the attachment and servicing, by the LSI-11, of subordinate interface cards. These are: an XQ/1822 board for ARPANET connection, and a pair of boards (XQ/NTDSI, XQ/NTDSO) for 32-bit NTDS operation.

ARPA has the requirement for operation of both the X.25 protocol and an HDLC type of connection on the LSI-11. ACC was contracted to develop a method for implementing an LSI-11 version of the UMC hardware. This LSI-11 based device was to be capable of operating with the software presently in use on the PDP-11 and UMC. To accomplish this ACC designed and implemented a working prototype of such a system for ARPANET use.

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PROJECT EVENTS

Several major stages of development resulted in a working prototype of the required system. These are listed below:

1. Specify, design, and implement the XQ/CP wire-wrap prototype.
2. Develop diagnostic programs for testing and debugging the prototype version of the XQ/CP.
3. Test and debug the prototype in operation with the LSI-11 and the MDMA.
4. Document and release the design for printed circuit packaging of the end product.
5. Design an I/O Driver for XQ/CP support in the LSI-11.
6. Design an I/O Executive for support of the X.25 and HDLC.
7. Repackage the UMC-X.25 program for use in the XQ/CP.
8. Repackage the UMC-HDLC program for use in the XQ/CP.
9. Receive and fabricate the printed circuit board version of the XQ/CP, and test it with the LSI-11.
10. Test and demonstrate the XQ/CP diagnostic, the XQ/CP X.25, and the XQ/CP HDLC software (firmware).
11. Deliver a complete system, for field testing, to an ARPA site.
12. Submit Final Report.

Documentation has been produced to support the hardware and software. Examples of this documentation have been made part of this Report and are included as appendices along with drawings and schematics.

REFERENCES

The present LSI-11 Multiplexor is referred to as the MDMA. Subordinate add-on boards or controllers use an "XQ" designation of imply that they are external to the MDMA on the Q bus of the LSI-11. The present units are MDMA, the XQ/1822, and the XQ/NTDS. The new communication processor that was added to this group under the contract was designated the XQ/CP.

1. XQCP.MM.V003 December 1982
XQ/CP Maintenance Manual
2. IF-11Q/HDLC.UM.V001 September 1982
IF-11Q/HDLC User's Manual
3. IF-11Q/X.25.UM.V001 September 1982
IF-11Q/X.25 User's Manual

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This document provides a summary of the development of hardware and software to accommodate protocols: AUTODIN II ADCCP-HDLC, and X.25 for LSI-11.		