5. Notes

Acronyms

Acronym	Meaning
Ada LRM	Ada Language Reference Manual
ASCII	American Standard Code for Information Interchange
CLI	Command Line Interface
<CR>	Carriage Return (key or ASCII character)
CSC	Computer Software Component
CSCI	Computer Software Configuration Item
CSU	Computer Software Unit
I/O	Input/Output
LRM	Language Reference Manual (Ada)
MSDOS	Microsoft Disk Operating System (for the PC)
PC	Personal Computer (compatible with the IBM 80x86–family)
SRS	Software Requirements Specification
SUM	Software User's Manual
UNIX	an operating system (not an acronym)
VAX	Virtual Address Extended computers by Digital Equipment Corporation
VDD	Version Description Document
VT100	Video Terminal model 100 by Digital Equipment Corporation

4. Qualification requirements

4.1. Qualification methods

Four groups of beta testers have been identified:

    1. Richard Conn and Harold Carter

    2. Arthur Adamson

    3. the students in the Spring 1992 Object–Oriented Programming Class

    4. personnel in the Software Engineering Technology subsection at GE Aircraft Engines

Groups 3 and 4 shall simply use the Ada LRM Reader during the normal routine of their work, reporting problems as they are uncovered. Groups 1 and 2 shall perform exhaustive tests on the Ada LRM Reader which include, at a minimum, the following:

    1. Executing the movement commands (next screen, previous screen, next citation, previous citation) on the first screen of the first citation, the last screen of the last citation, and on three or more citations in between,

    2. Executing the movement commands on the first screen, last, and middle (if any) screens of the Help Citation and the About Citation,

    3. Executing the PRINT and PS commands from the first screen of the first citation, the last screen of the last citation, and on three or more citations in between,

    4. Executing the / and // commands from the first screen of the first citation, the last screen of the last citation, on three or more citations in between, on the CONTENTS citation, and on the INDEX citation (the / and // commands will be executed with and without arguments, including at least one test where they are executed without arguments before a default string has been specified),

    5. Executing the PUSH command on the CONTENTS citation, the INDEX citation, the FOREWARD citation, the POSTSCRIPT citation, the first citation, the last citation, and three or more citations in between,

    6. Executing the PUSH command until a location stack overflow occurs and then continuing,

    7. Executing the POP command like the PUSH command was executed in items 5 and 6,

    8. Executing the REFRESH and PAUSE commands several times,

    9. Executing the HELP command several times,

    10. Executing the QUIT command, and

    11. Creating and executing several batch files to test the operation of the Ada LRM Reader through redirected input.

4.2. Special qualification requirements

No special qualification requirements have been identified.

Key to the user interface shall be an easy–to–use interface that is intuitive to some extent and very responsive in terms of execution speed.

Ideas will be proposed if a superior user interface which meets the user constraints is evident.

3.9. Risk Assessment

No significant risks have been identified with this project. More than a dozen prototypes were developed during the generation of these requirements (the Spiral Model for software development was applied), and the final prototype was found to be able to meet these requirements and constraints.

The reusable components library CS Parts has already been ported to the target and development platforms.

The data to go into the LRM data files is available in the Ada Software Repository at White Sands.

3.5. Adaptation requirements

The Ada LRM Reader shall be able to run on a PC, UNIX, or VAX platform supported by a validated Ada 83 compiler.

A VT100 display or emulator shall be assumed to be the display target. This display or emulator must support at least the VT100 commands for clear screen, position cursor, and erase to end of line.

The Ada LRM Reader shall be able to read an argument (which is an initial citation) from the command line. The CLI package from CS Parts is to be used for this purpose in order to help support portability of the code of the Ada LRM Reader.

3.5.1. Installation–dependent data

The LRM Data Files and Ada LRM Reader Support Files shall be placed in a directory somewhere on the target system. The name of this directory shall be isolated in a System Dependencies package so that it can be easily modified without entering the major body of code.

3.5.2. Operational parameters

No extraordinary operational parameters have been identified.

3.6. Sizing and timing requirements

The executable of the Ada LRM Reader, the Ada source code to the Ada LRM Reader, the LRM Data Files, and the Ada LRM Reader Support Files shall be able to fit (in compressed form) on a single 5 1/2" high density (1.2M bytes) floppy disk.

The LRM Data Files and the Ada LRM Reader Support Files shall occupy no more than 5M bytes of disk space in uncompressed form.

The Ada LRM Reader's executable shall be small enough to run on an 80286 or greater PC in 540K of memory with the MSDOS operating system version 3.3 or greater.

The Ada LRM Reader shall be able to respond to user commands as quickly as possible. 1/2 a second is a reasonable delay period.

The Ada LRM Reader shall respond within 2 seconds after the command to execute it is completed.

3.7. Design constraints

The design of this system shall be object–oriented and event–driven. The sizing and timing requirements (Section 3.6.) are the key design constraints other than the object–oriented, event–driven constraint. Events for the Ada LRM Reader may be assumed to be synchronous.

3.8. Human performance/human engineering requirements

The user interface shall be as described earlier.

3.4. CSCI data element requirements
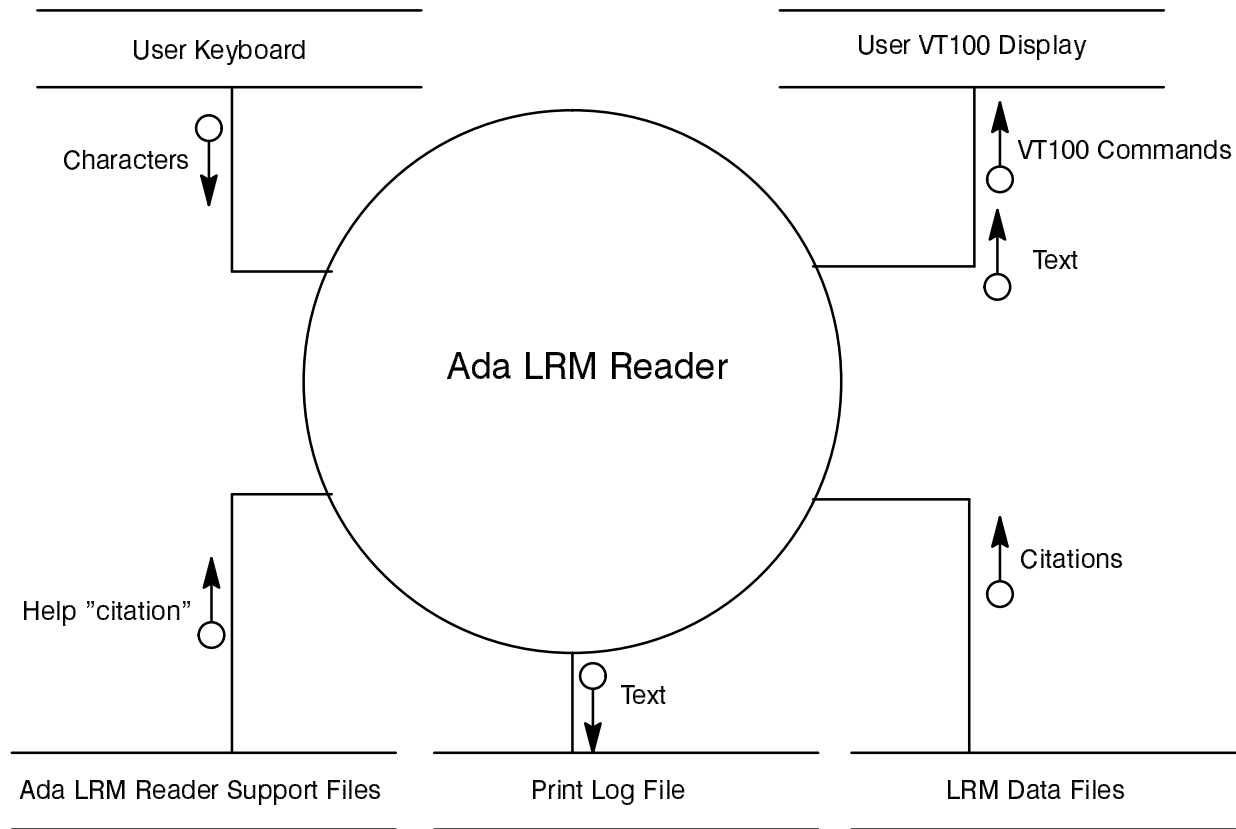
The following are the data dictionary entries for the key data elements.

1. Character – an ASCII character

2. Text – one or more ASCII characters

3. Citation – a collection of information identified by (1) a chapter number, (2) a chapter and a section number, (3) a chapter, section, and subsection number, (4) an appendix letter, (5) one of the key-words CONTENTS, INDEX, FOREWARD, or POSTSCRIPT, or (6) a set of help screens or error message screens

   Consists of ASCII characters at the least

4. VT100 Commands – the commands which cause the VT100 display or VT100 emulator to perform an action, such as clear screen or position cursor

   Consist of ASCII characters and are generated by routines in the Console package of CS Parts

5. Print Log File – an ASCII text file containing one or more citations or citation screens preceeded by banners

3.3. Entity relationships

The following diagram depicts the principal entities in this system and their relationships to each other.
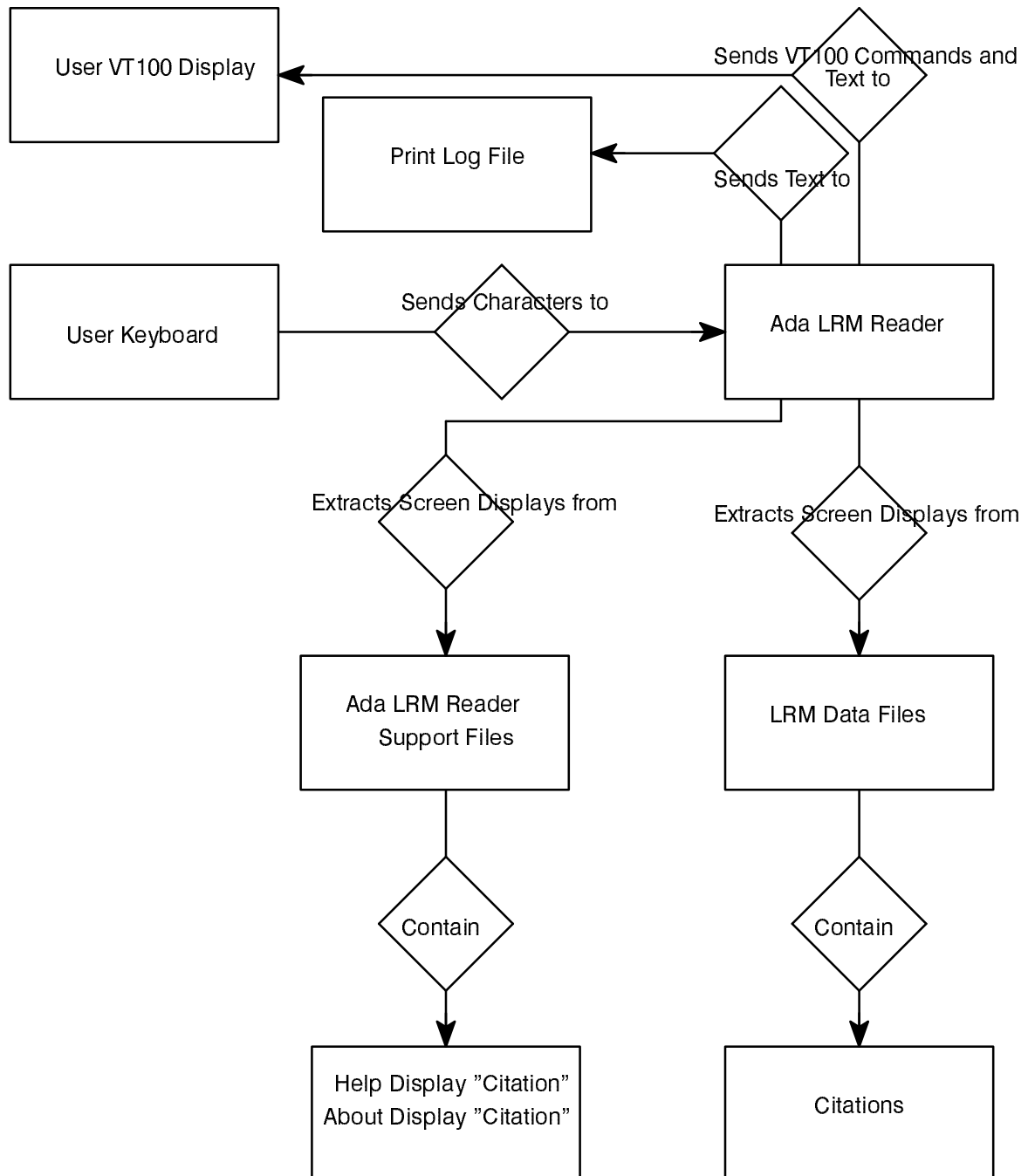
When the user is in the CONTENTS, INDEX, POSTSCRIPT, FOREWARD, HELP, and ABOUT citations, there is, by definition, no "next" or "previous" citation.

3.2.4. String searches

The user of the Ada LRM Reader shall be able to search for a given string from either the first line of the current citation or the next line (assuming that a previous search command was issued) of the current citation. The search extends from the indicated line to the last line of the current citation.

The search commands may be given with or without an argument. If given with an argument, the indicated string will be used in the search. If given with no argument, the last string given will be used in the search.

When the string is found, the screen containing the string will be displayed to the user and the line containing the string will be indicated by a less than symbol ($<$) in column 79 of that line.

3.2.5. Other capabilities

A refresh command shall refresh the current screen.

A pause command shall delay execution of the Ada LRM Reader for about 5 seconds. This command is used in batch files redirected from standard input to test the Ada LRM Reader.

3. Engineering requirements

3.1. CSCI external interface requirements

The principal interface to this CSCI shall be an ASCII character stream coming from standard input (usually a user's keyboard, but a data file may be used for testing) and an ASCII character stream going to standard output (usually a user's VT100–compatible display).

3.2. CSCI capability requirements

The Ada LRM Reader is a tool which allows an Ada programmer or designer to reference the Ada Language Reference Manual (LRM) online. Details on how to invoke and use the Ada LRM Reader are given in the "Software User's Manual for the Ada LRM Reader." This document will be viewed as an extension to this Software Requirements Specification. It is recommended that the reader review the SUM to understand the terminology and use of the Ada LRM Reader.

3.2.1. Display citations

The Ada LRM Reader shall be able to display any valid citation presented by the user on the command line or at the command prompt. This citations include chapter numbers (n), chapter and section numbers (n.n), and chapter, section, and subsection numbers (n.n.n). In addition, special parts of the LRM shall be accessed by giving their names: CONTENTS, INDEX, POSTSCRIPT, and FOREWARD.

The user shall be able to display a citation in two ways: (1) by moving into it, leaving the current citation, and (2) by pushing into it, marking his place on a Location Stack and then moving into it. If the user pushes into a citation, he shall be able to return to his previous location by issuing a POP command. The Location Stack used shall be at least 10 levels deep.

Online documentation shall be viewed by issuing a HELP command. The HELP command shall do a push into a set of help screens (the "Help Citation") which explain how to use the Ada LRM Reader.

3.2.2. Print citations

The user of the Ada LRM Reader shall be able to print either (1) the entire citation he is currently viewing or (2) the screen he is currently viewing. The print process shall involve creating a file named LRM.LOG, writing a banner into the log file which identifies the citation or the citation and screen, and storing the text lines into the log file.

When the user issues the QUIT command, the Ada LRM Reader shall close the log file before exiting.

3.2.3. Movement within and between citations

The user of the Ada LRM Reader shall be able to move to the next screen and previous screen of the current citation. The citations start with Chapter 1 and go through Chapter 14, followed by Appendices A through F. The user shall also be able to move to the next and the previous citation.

Citation Label – A numeric reference or a keyword which identifies a citation. For example, 4 is the citation label for the above citation. Valid citation labels take the following forms:

Label	Refers to
n	Chapter (1–14)
n.n	Chapter and Section
n.n.n	Chapter, Section, and Subsection
letter	Appendix (A–F)
CONTENTS	Table of Contents
INDEX	Index
FOREWARD	Foreward
POSTSCRIPT	Postscript
HELP	Online help screens for the Ada LRM Reader
ABOUT	Online program description of the Ada LRM Reader

Citation ID – An alphabetic reference used in the CITATION_ID enumeration type which maps to a citation label. Citation IDs are discussed in the Software Design Document for the Ada LRM Reader. Each citation label has one and only one citation ID.

2. References

2.1. Documents

The following documents of the exact issue shown form a part of this specification to the extent specified herein. In the event of conflict between the documents referenced herein and the contents of this specification, the contents of this specification shall be considered a superseding requirement.

Conn, Richard, **Software User's Manual for the CS Parts –– A Catalog of Reusable Ada Software Components for General Purpose Use and Computer Science and Computer Engineering Education**, March 1991, Ada Software Repository, White Sands Missile Range, New Mexico and University of Cincinnati, Department of Electrical and Computer Engineering, Mail Location 30, Cincinnati, Ohio 45221.

Conn, Richard, **Software User's Manual for the Ada LRM Reader**, University of Cincinnati, Department of Electrical and Computer Engineering, Mail Location 30, Cincinnati, Ohio 45221.

Nyberg, Karl (editor), **The Annotated Ada Reference Manual**, ANSI/MIL–STD–1815A–1983, 1989, Grebyn Corporation, P.O. Box 497, Vienna, VA 22183

2.2. Internet host computers

The Ada Software Repository is located on the host computer named:

WSMR–SIMTEL20.ARMY.MIL

This computer recognizes the Internet anonymous login convention (user name "anonymous", password "guest") for FTP file transfers. Once logged in via FTP, the root directory is PD2:<ADA>, and the subdirectory PD2:<ADA.MASTER–INDEX> contains softcopy of a document which describes all items in the Ada Software Repository.

A mirror copy of the Ada Software Repository is located on the host computer named:

WUARCHIVE.WUSTL.EDU

This computer also recognizes the Internet anonymous login convention, although it is preferred that the user give "account_name@host" as his password so the user may be later identified. Once logged in via FTP, the root directory is mirrors2/ada, and the subdirectory mirrors2/ada/master–index contains the same softcopy document described above.

2.3. Terminology

The following application–specific terms are defined below in order to better follow this document:

Citation – A body of text in the Ada LRM or an LRM Support File which is uniquely identified by a numeric reference or a keyword (these are called citation labels). For example, the citation identified by 4 is:

```
                4. Names and Expressions


        The rules applicable to the different forms of name and expression, and
        to their evaluation, are given in this chapter.
```

Since the Ada LRM Reader is to run on a UNIX workstation or a PC, the code of the reader shall be written to be portable. In addition, this code shall be written in Ada.

The CS Parts catalog of Ada software components is a trusted, reliable library of components which may be used on this project. It is available from the Ada Software Repository at White Sands.
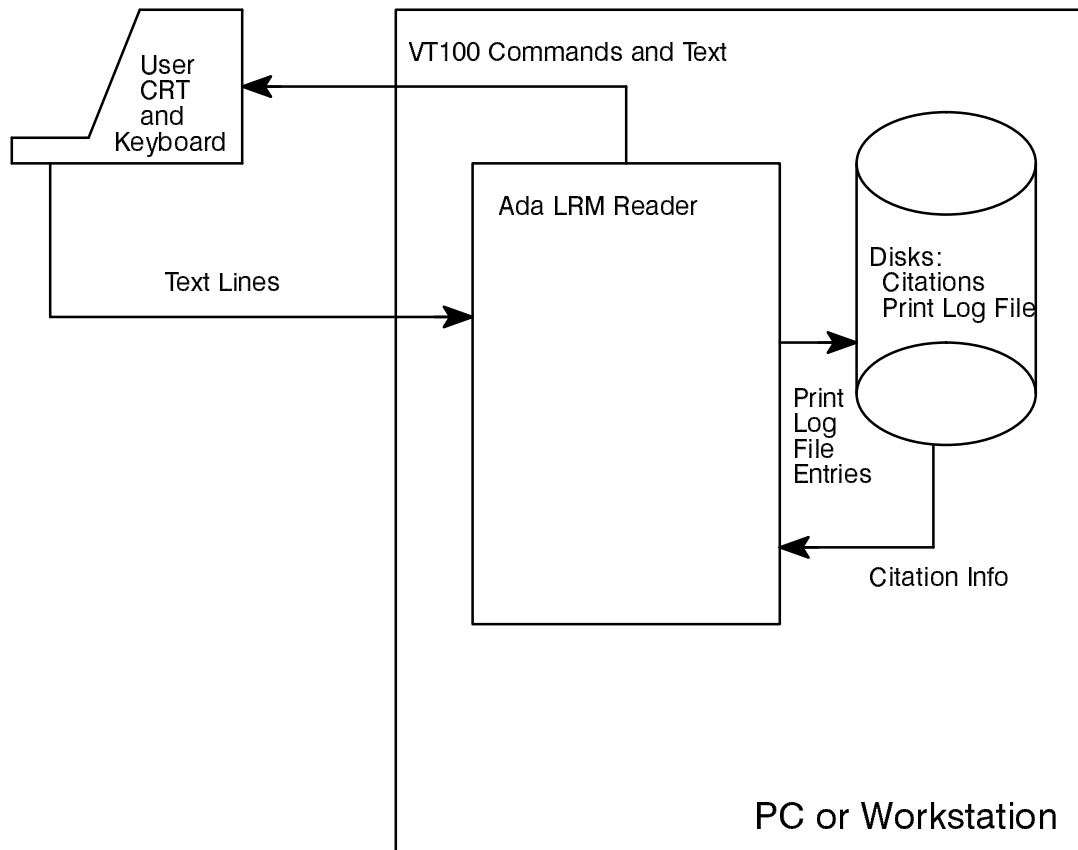
The Ada LRM Reader is a single program written in Ada and will be considered to be a single CSCI. This CSCI includes:

1. The source code, in Ada, of the Ada LRM Reader

2. All data files needed by the Ada LRM Reader

3. All source files and programs used to create the data files needed by the Ada LRM Reader

4. All documentation associated with the Ada LRM Reader

5. Installation instructions for compiling the setting up the Ada LRM Reader for a PC or UNIX platform

6. A complete executable version of the Ada LRM Reader with its associated data files and installation instructions which is ready to run on a PC under MSDOS 3.3 or higher

1. Scope

The Ada LRM Reader is a tool for browsing through an online copy of the Ada Language Reference Manual (LRM). This tool shall allow a user to interactively view the Ada LRM, search for strings, and move through the Ada LRM with ease. Ease of human interface is a chief concern.

The Ada LRM Reader is a program (composed of a single CSCI) which interacts with a user through a command-line and a line-oriented editor to display information in the Ada Language Reference Manual (LRM) to the user one screen at a time. The major components of this environment are:

```
        User                VT100 Commands and Text
        CRT
        and                      Ada LRM Reader
        Keyboard
                                                      Disks:
                                                        Citations
        Text Lines                                      Print Log File

                                          Print
                                          Log
                                          File
                                          Entries

                                                      Citation Info

                                              PC or Workstation
```

A machine-readable copy of the Ada LRM is available from the Ada Software Repository at White Sands. This will be used as a basis for the data accessed by the program.

The target user will be assumed to have a VT100-style display terminal or VT100 emulation capabilities. The user will be using this tool in one of several modes:

1. As a user on a UNIX workstation running in a VT100 emulator window,

2. As a user accessing a UNIX workstation remotely, also running a VT100 or VT100 emulator on a PC, and

3. As a user on a PC running the Ada LRM Reader on the PC.