SPECIFICATION

FOR

ASCENT LOGIC CORPORATION, RDD-100 SCHEMA EXTENSIONS

TO SUPPORT LOCKHEED MARTIN PRICE, MANAGEMENT SCIENCES, INC., and JRS RESEARCH LABORATORIES INC. TOOLSETS

Final

December 11, 1996

Prepared for:

Rapid Prototyping of Application Specific Signal Processors Program

Lockheed Martin
Government Electronic Systems
One Federal Street
A & E 2W
Camden, NJ 08102

Purchase Order TTM748341

Prepared by:

Ascent Logic Corporation
180 Rose Orchard Way
Suite 200
San Jose, CA 95134

Initiated by:_____ Date: _____

Approved by:_____ Date: _____

Table of Contents

1.0 Scope

This document is intended to specify the extensions to Ascent Logic Corporation's RDD-100, version 4.1.1, systems engineering tool schema. These extensions will provide RDD-100 the ability to generate and receive data as specified in this document to and from LMC's PRICE and MSI's Reality toolsets (RAM-ILS).

The intended use of these schema extensions, including the context, is found in other documentation.

2.0 Overview

RDD-100 is based on an element, relation, attribute database. Elements are objects that can be further characterized by attributes. In addition, relationships may be established between element types.

A RDD-100 user creates instances of element types, add values to the attributes and creates relationships between instances of the element types.

A specific set of element types, attributes for each element type and permissible relationships between element types are included in the COTS product. These and a set of views of the element types called facilities constitute the RDD-100 schema.

Sets of schema extensions are also supplied with the COTS product.

This specification will address additions to the COTS available schema's.

3.0 RASSP schema

The RASSP base schema shall consist of the COTS RDD-100 version 4.0.3 core schema and the Design Guide A extensions. The RASSP schema shall be updated for version 4.1.1 of RDD-100.

4.0 Extensions to the RASSP base schema

The RASSP base schema shall be extended to store parameters used and generated by the PRICE, MSI Reality and JRS toolsets. The base schema shall also be extended to add functionality to the base schema. The elements and relations listed in Table 1 and the attributes listed in Table 2 are required to accomplish both extensions.

Table 1 Element and Relation Extensions

ELEMENTS	ATTRIBUTES	RELATIONS	TARGETS	COMMENT
AbstractObjectType		specified by	Requirement	New relation
AttributeType		specified by	Requirement	New relation
Capability				Deleted
Category		categorizes	Any element type	New relation
Component	See Table 2	tested [tests] costs [cost for] duplicates included by executed on [executes] satisfies [satisfied by] has rma of [rma for]	TestCase Cost (only one permitted) DuplicateComponents (only one permitted) Component LifeCycleParameter (only one permitted) RMA (only one permitted)	New attributes & relations
Cost	Standard plus see Table 2	cost for [costs] cost for [costs] sum of summed by	Component (only one permitted) DuplicateComponents (only one permitted) Cost Cost	New element, relations and attributes
CriticalIssue	See Table 2			New attributes
DiscreteFunction	See Table 2	has verification method of [verification method for] verified by [verifies] justified by [justifies]	Verification Method VerificationMethod Requirement	New attributes New relations
DiscreteItem	See Table 2	specified by	Requirement	New relation New attributes
Duplicate-Components	Standard plus see Table 2	includes duplicate [duplicates included by] costs [cost for] has rma of [rma for]	Component Cost (only one permitted) RMA (only one permitted)	New element, relations and attributes
LifeCycleParameter	Standard plus see Table 2	satisfied by [satisfies]	Component	New element, relations and attributes
Mode				Deleted
Performance Characteristic	Standard plus see Table 2	analyzed by [analyzes] exhibited by [exhibits] includes [included in] included in [includes] motivated by [motivates] required by [requires] specified by [specifies]	Scenario Component, System Performance Characteristic Performance Characteristic DiscreteFunction, RDDprocess, TimeFunction OperationalObjective Requirement	New element, relations and attributes
ExternalToolFiles	Standard plus see Table 2	none		New element
ReportDocument	Standard plus see Table 2	traces to [traced from]	ReportDocument	Deleted applies [applied from]

Table 1 Element and Relation Extensions

ELEMENTS	ATTRIBUTES	RELATIONS	TARGETS	COMMENT
Requirement	Standard plus see Table 2	justifies [justified by] specifies has verification method of [verification method for]	TimeFunction DiscreteFunction AbstractObjectType AttributeType DiscreteItem Performance Characteristic VerificationMethod	New relation New targets
RMA	Standard plus see Table 2	rma for [has rma of] rma for [has rma of]	Component (only one permitted) DuplicateComponents (only one permitted)	
State				Deleted
Source	see Table 2			New attributes
TestCase	Standard	Standard categorized by tests [tested] incorporates incorporated by implemented by [implements]	Standard Category Component DiscreteFunction Scenario TimeFunction Verification-Requirement TestCase TestCase TestProcedure	New element, relations
TestProcedure	Standard	Standard implements [implemented by]	Standard TestCase	New element, relations
TimeFunction	see Table 2	has verification method of [verification method for] verified by [verifies] justified by [justifies]	Verification Method Requirement VerificationMethod	New attributes
VerificationMethod	see Table 2	verification method for [has verification method of]	 DiscreteFunction Requirement TimeFunction Transform	New and changed attributes New Targets
Verification-Requirement		tested [tests] verifies [verified by]	TestCase DiscreteFunction TimeFunction Transform	New relation New targets

Table 2 Attribute Extensions

P = PRICE, R = Reality, J = JRS

ELEMENT	ATTRIBUTE	DATA TYPE	TO	FM
Component	Component Type: Add FWCI,FWC & FWU	Enumerated list (Symbol)	P&R	
	Component Sub Type (High Level Assembly, Cabinet, Drawer, Enclosure, Multiple Board Assembly, Board, Module Backplane/Cabling, Power Supply,N/A)	Enumerated list (Symbol)	P&R	
	Design Source (New, COTS, Furnished, Reuse, Modified COTS, Modified Furnished, Modified Reuse, nil)	Enumerated List(Symbol)	P	
	Percent of New Design	Integer	P	
	Duplicate - Used in other assemblies (Yes, No) default No	Enumerated list (Symbol)	P	
	Quantity in Next higher Assembly	integer	P&R	
	HARDWARE RELATED ATTRIBUTES	Used as comment		
	Quantity Requested for RMA	integer		R
	Quantity Required for Operation (Enter Only to Indicate Redundancy)	integer	P&R	
	Redundancy mode (“Operational, On Line replacement”, “Operational, Off Line replacement”, “Standby , On Line replacement”, “Standby, Off Line replacement”)	Enumerated List (Symbol)	P&R	
	* VOLUME	Used as comment		
	Length predicted (ft)	float	P,R&J	
	Length budgeted (ft)	float	P,R&J	
	Width predicted (ft)	float	P,R&J	
	Width budgeted (ft)	float	P,R&J	
	Depth predicted (ft)	float	P,R&J	
	Depth budgeted (ft)	float	P,R&J	
	Volume sensitivity (10,9,8,7,6,5,4,3,2,1,nil)	Enumerated List (Symbol)	R&J	
	Weight predicted (lb.)	float	P,R&J	
	Weight budgeted (lb.)	float	P,R&J	
	Weight sensitivity (10,9,8,7,6,5,4,3,2,1,nil)	Enumerated List (Symbol)	R&J	
	Power maximum predicted (watts)	float	R&J	
	Power maximum budgeted (watts)	float	R&J	
	Power average predicted (watts)	float	R&J	
	Power average budgeted (watts)	float	R&J	
	Power sensitivity (10,9,8,7,6,5,4,3,2,1,nil)	Enumerated List (Symbol)	R&J	
	Technology Maturity (State of the Art, Leading Edge, Mature, Obsolete)	Enumerated List(Symbol)	P&R	
	* PERCENT MIX OF TECHNOLOGY AND TYPE OF EQUIPMENT ALL ENTRIES MUST ADD UP TO 100	Used as comment		

Table 2 Attribute Extensions

P = PRICE, R = Reality, J = JRS

ELEMENT	ATTRIBUTE	DATA TYPE	TO	FM
Component (continued)	Technology Type 1 (Discrete, SSIC, MSIC, LSI, VLSI, VHSIC, None, nil)	Enumerated List (Symbol)	P	
	Equipment Type 1 (Analog Audio, Analog RF/Video, Digital, Display, Display no CRT, Transmitter, Transmitter, Power Conditioning, Structure, nil)	Enumerated List (Symbol)	P	
	Percent of Technology and Equipment 1	integer	P	
	Technology Type 2 (Discrete, SSIC, MSIC, LSI, VLSI, VHSIC/GA, VHSIC/Mem,Other, nil)	Enumerated List (Symbol)	P	
	Equipment Type 2 (Analog Audio, Analog RF/Video, Digital, Display, Display no CRT, Transmitter, Power Conditioning, Structure, nil)	Enumerated List (Symbol)	P	
	Percent of Technology and Equipment 2	integer	P	
	Technology Type 3 (Discrete, SSIC, MSIC, LSI, VLSI, VHSIC, None, nil)	Enumerated List (Symbol)	P	
	Equipment Type 3 (Analog Audio, Analog RF/Video, Digital, Display, Display no CRT, Transmitter, Power Conditioning, Structure, nil)	Enumerated List (Symbol)	P	
	Percent of Technology and Equipment 3	integer	P	
	Technology Type 4 (Discrete, SSIC, MSIC, LSI, VLSI, VHSIC, None, nil)	Enumerated List (Symbol)	P	
	Equipment Type 4 (Analog Audio, Analog RF/Video, Digital, Display, Display no CRT, Transmitter, Power Conditioning, Structure, nil)	Enumerated List (Symbol)	P	
	Percent of Technology and Equipment 4	integer	P	
	Technology Type 5 (Discrete, SSIC, MSIC, LSI, VLSI, VHSIC, None, nil)	Enumerated List (Symbol)	P	
	Equipment Type 5 (Analog Audio, Analog RF/Video, Digital, Display, Display no CRT, Transmitter, Power Conditioning, Structure, nil)	Enumerated List (Symbol)	P	
	Percent of Technology and Equipment 5	integer	P	
	SOFTWARE RELATED ATTRIBUTES	Used as comment		
	SLOC, Source Lines of Code	integer	P	
	Percent of Memory Utilization	integer	P	
	Percent of Processor Utilization	integer	P	
	Language (ADA83, ADA95, C, C++, Assembly, Micro Code, Machine, VHDL, High Order, Interpretive, ATLAS, Mixed, n/a)	Enumerated List(Symbol)	P	
	Percent New Code	float	P	
	THE MIX OF CODE TYPES SHOULD EQUAL 100%	Used as comment		
	Mathematics (1)	integer	P	
	String Manipulation (2)	integer	P	
	Store and Retrieve (4)	integer	P	
	Online Communications (6)	integer	P	
	Real Time (8)	integer	P	
	I Operating System or Interactive (10)	integer	P	
	User Defined Type (value below)	integer	P	
	Design Difficulty Value for User Defined Type	nil, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10	P	
	COST UNIT (DOLLARS)	Used as Comment		
	Purchased Item	float	P	

Table 2 Attribute Extensions

P = PRICE, R = Reality, J = JRS

ELEMENT	ATTRIBUTE	DATA TYPE	TO	FM
Cost (continued	Development predicted	integer	P &J	P
	Development budgeted	integer	P &J	
	Amortized Unit Production predicted	float	R	P
	Amortized Unit Production budgeted	float	R	P
	Unit Production predicted	float	R	P
	Unit Production budgeted	float	R	P
	Total Production Quantity	integer	R	P
	Production predicted	integer	P,R&J	P
	Production budgeted	integer	P,R&J	
	Production sensitivity (10,9,8,7,6,5,4,3,2,1,nil)	Enumerated List (Symbol)	R&J	
	Operational predicted	integer	R&J	
	Operational budgeted	integer	R&J	
	Operational sensitivity (10,9,8,7,6,5,4,3,2,1,nil)	Enumerated List (Symbol)	R&J	
	Support predicted	integer	P,R&J	
	Support budgeted	integer	P,R&J	P
	Support sensitivity (10,9,8,7,6,5,4,3,2,1,nil)	Enumerated List (Symbol)	R&J	
CriticalIssue	Closure Date	string		
	Impact	string		
	Responsible Individual	string		
	Risk Level (Low , Medium, High)	Enumerated List(Symbol)		
	Status	string		
Duplicate Components	Component Type: Add FWCI,FWC & FWU	Enumerated list (Symbol)		
	Component Sub Type (High Level Assembly, Cabinet, Drawer, Enclosure, Multiple Board Assembly, Board, Module Backplane/Cabling, Power Supply, N/A)	Enumerated list (Symbol)		
	Design Source (New, COTS, Furnished, Reuse, Modified COTS, Modified Furnished, Modified Reuse, nil)	Enumerated List(Symbol)		
	Percent of New Design	Integer		
	Total System Quantity (calculated) (Calculated by multiplying each related components' Qty NHA by the NHAs' Qty NHA and summing all the results of each related component)	integer	P&R	
	* HARDWARE RELATED ATTRIBUTES	Used as comment		
	* VOLUME	Used as comment		
	Length predicted (ft)	float		
	Length budgeted (ft)	float		
	Width predicted (ft)	float		
	Width budgeted (ft)	float		
	Depth predicted (ft)	float		
	Depth budgeted (ft)	float		
	Volume sensitivity (10,9,8,7,6,5,4,3,2,1,nil)	Enumerated List (Symbol)		
	Weight predicted (lb.)	float		

Table 2 Attribute Extensions

P = PRICE, R = Reality, J = JRS

ELEMENT	ATTRIBUTE	DATA TYPE	TO	FM
Duplicate Components (continued)	Weight budgeted (lb.)	float		
	Weight sensitivity (10,9,8,7,6,5,4,3,2,1,nil)	Enumerated List (Symbol)		
	Power maximum predicted (watts)	float		
	Power maximum budgeted (watts)	float		
	Power average predicted (watts)	float		
	Power average budgeted (watts)	float		
	Power sensitivity (10,9,8,7,6,5,4,3,2,1,nil)	Enumerated List (Symbol)		
	Technology Maturity (State of the Art, Leading Edge, Mature, Obsolete)	Enumerated List(Symbol)		
	* PERCENT MIX OF TECHNOLOGY AND OF EQUIPMENT ALL ENTRIES MUST ADD UP TO 100	Used as comment		
	Technology Type 1 (Discrete, SSIC, MSIC, LSI, VLSI, VHSIC, None, nil)	Enumerated List (Symbol)		
	Equipment Type 1 (Analog Audio, Analog RF/Video, Digital, Display, Display no CRT, Transmitter, Power Conditioning, Structure, nil)	Enumerated List (Symbol)		
	Percent of Technology and Equipment 1	integer		
	Technology Type 2 (Discrete, SSIC, MSIC, LSI, VLSI, VHSIC, None, nil)	Enumerated List (Symbol)		
	Equipment Type 2 (Analog Audio, Analog RF/Video, Digital, Display, Display no CRT, Transmitter, Power Conditioning, Structure, nil)	Enumerated List (Symbol)		
	Percent of Technology and Equipment 2	integer		
	Technology Type 3 (Discrete, SSIC, MSIC, LSI, VLSI, VHSIC, None, nil)	Enumerated List (Symbol)		
	Equipment Type 3 (Analog Audio, Analog RF/Video, Digital, Display, Display no CRT, Transmitter, Power Conditioning, Structure, nil)	Enumerated List (Symbol)		
	Percent of Technology and Equipment 3	integer		
	Technology Type 4 (Discrete, SSIC, MSIC, LSI, VLSI, VHSIC, None, nil)	Enumerated List (Symbol)		
	Equipment Type 4 (Analog Audio, Analog RF/Video, Digital, Display, Display no CRT, Transmitter, Power Conditioning, Structure, nil)	Enumerated List (Symbol)		
	Percent of Technology and Equipment 4	integer		
	Technology Type 5 (Discrete, SSIC, MSIC, LSI, VLSI, VHSIC, None, nil)	Enumerated List (Symbol)		
	Equipment Type 5 (Analog Audio, Analog RF/Video, Digital, Display, Display no CRT, Transmitter, Power Conditioning, Structure, nil)	Enumerated List (Symbol)		
	Percent of Technology and Equipment 5	integer		
	SOFTWARE RELATED ATTRIBUTES	Used as comment		
	SLOC, Source Lines of Code	integer		
	Percent of Memory Utilization	integer		
	Percent of Processor Utilization	integer		

Table 2 Attribute Extensions

P = PRICE, R = Reality, J = JRS

ELEMENT	ATTRIBUTE	DATA TYPE	TO	FM
Duplicate Components (continued)	Language (ADA83, ADA95, C, C++, Assembly, Micro Code, Machine, VHDL, High Order, Interpretive, ATLAS, Mixed, n/a)	Enumerated List(Symbol)		
	Percent New Code	float		
	THE MIX OF CODE TYPES SHOULD EQUAL 100%	Used as comment		
	Mathematics (1)	integer		
	String Manipulation (2)	integer		
	Store and Retrieve (4)	integer		
	Online Communications (6)	integer		
	Real Time (8)	integer		
	Operating System or Interactive (10)	integer		
	User Defined Type (value below)	integer		
	Design Difficulty Value for User Defined Type	nil, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10		
DiscreteItem	Arrival Rate average (words/sec)	float	J	
	Arrival Rate peak (words/sec)	float	J	
DiscreteFunction	Critical path (yes, no) Defaults to yes	Enumerated List(Symbol)	R	
LifeCycleParameter	Operating Environment (Commercial Ground, Commercial Ground High Grade, Commercial Mobile, Commercial Airborne, Military Ground - Benign, Military Ground - Fixed, Military Mobile, Military Naval Sheltered, Military Naval Unsheltered, Military Airborne-inhabited cargo, Military Airborne-inhabited fighter, Military Airborne-uninhabited cargo, Military Airborne - uninhabited fighter, Military Airborne - rotary wing, Military Missile - flight, Military Missile - launch, Space Manned, Space Unmanned, nil)	Enumerated List(Symbol)	P&R	
	Operational Environment Temperature Max (F)	float	R	
	Operational Environment Temperature Min (F)	float	R	
	Availability (operational)	float	R	
	Availability (inherent)	float	R	
	Reliability	float	R	
	Deployment Quantity	integer	P&R	
	Prototype Quantity	integer	P	
	Mission Period (hrs)	float	P & R	
	Duration of Lifecycle (years)	float	P & R	
	On Time Factor (hrs per month)	float	P & R	
	SENSITIVITY TO CHANGE FOR MTB(C)F OPTIMIZATION	Used as comment		
	Volume (10,9,8,7,6,5,4,3,2,1)	Enumerated List (Symbol)	R	
	Weight (10,9,8,7,6,5,4,3,2,1)	Enumerated List (Symbol)	R	
	Power (10,9,8,7,6,5,4,3,2,1)	Enumerated List (Symbol)	R	
	Production Cost (10,9,8,7,6,5,4,3,2,1)	Enumerated List (Symbol)	R	
	Operational Cost (10,9,8,7,6,5,4,3,2,1)	Enumerated List (Symbol)	R	
	Support Cost (10,9,8,7,6,5,4,3,2,1)	Enumerated List (Symbol)	R	

Table 2 Attribute Extensions

P = PRICE, R = Reality, J = JRS

ELEMENT	ATTRIBUTE	DATA TYPE	TO	FM
Performance Characteristic	Type (State, Mode, Capability) Default: Capability	Enumerated List(Symbol)		
ExternalToolFiles	Cost Account File Requested	string	P	
	Cost Account File Used	string		P
	Sync. File Requested	string	P	
	Sync. File Used	string		P
	Lock Name Requested	string	P	
	Lock Name Used	string		P
	RAM-ILS Directory Used	string		R
ReportDocument	Format Standard (490A/2167A, 498, nil) Default: nil	Enumerated List(Symbol)		
Requirement	Report Option (begin lettered item, begin paragraph, follow previous text, autocreate Section (as applicable)) Default: begin lettered item	Enumerated List(Symbol)		
RMA	Allow RMA Quantity Request (Yes, No, nil) Default - nil	Enumerated List(Symbol)	R	
	Availability predicted	float	P	R
	Reliability predicted	float		R
	MTBCF budgeted (hr)	float	P,R&J	
	MTBCF predicted (hr)	float	P & J	R
	MTBF budgeted (hr)	float	P,R&J	
	Optimized MTBF (hr)	float		R
	MTBF Optimization Criteria	string		R
	MTBF predicted (hr)	float	P & J	R
	Method used for MTBF predicted	string		R
	LRU, Line Replaceable Unit(Yes, No)	Enumerated List(Symbol)	P&R	
	Maintenance Procedure	string		R

Table 2 Attribute Extensions

P = PRICE, R = Reality, J = JRS

ELEMENT	ATTRIBUTE	DATA TYPE	TO	FM
RMA (continued)	Maintenance Concept Requested for Costing Discard LRU at failure Replace mods at ORG. Scrap bad mods. Replace mods at INT. Scrap bad mods. Replace mods at DPT. Scrap bad mods. Replace mods at ORG. Repair mods at INT. Replace mods at ORG. Repair mods at DPT. Replace parts at INT. Replace mods at INT. Repair mods at DPT. Replace parts at DPT. Replace parts at ORG. Replace mods at EQP. Scrap bad mods. Replace mods at EQP. Repair mods at ORG. Replace mods at EQP. Repair mods at INT. Replace mods at EQP. Repair mods at DPT. Replace mods at contractor. Scrap bad mods. Replace mods at EQP. Repair mods at contractor. Replace mods at ORG. Repair mods at contractor. Replace mods at INT. Repair mods at contractor. Replace parts at contractor. Recheck LRU at ORG. Scrap bad LRU. Recheck LRU at ORG. Replace mods at INT. Scrap bad mods. Recheck LRU at ORG. Replace mods at DPT. Scrap bad mods. Recheck LRU at ORG. Replace parts at INT. Recheck LRU at ORG. Replace mods at INT. Repair mods at DPT. Recheck LRU at ORG. Replace parts at DPT. Recheck LRU at ORG. Replace mods at contractor. Scrap bad mods. Recheck LRU at ORG. Replace mods at INT. Repair mods at cont. Recheck LRU at ORG. Replace parts at contractor. nil	Enumerated List(Symbol)	P	
	Maintenance Concept Used for Costing	string		P
	MTTR, line, predicted (hr)	float	P&R	R
	MTTR, line, budgeted (hr)	float	P&R	
	THESE MTTR VALUES ARE POPULATED BY MSI FOR USE BY PRICE	Used as comment		
	MTTR, LRU ORG (Tf)	float	P	R
	MTTR, Module ORG (Tmo)	float	P	R
	MTTR, LRU IL (Ti)	float	P	R
	MTTR, Module IL (Tmi)	float	P	R
	MTTR, LRU Depot (Td)	float	P	R
	MTTR, Module Depot (Tmd)	float	P	R
Source	Document Control Number	string		
	Document Date	string		
	Source Type Added: ICD, IDD, IRS	Enumerated List(Symbol)		
TimeFunction	Critical path (yes, no) Defaults to yes	Enumerated List(Symbol)	R	
Verification-Method	Method - Removed Simulation Level - Changed to (System, Segment, Prime Item, Configuration Item, Unit, Module)	Enumerated List(Symbol) Enumerated List(Symbol)		

5.0 Multi Element View (MEV) Templates

Multi Element View (MEV) templates shall be created to display the elements, relations, targets and attributes.

A. A MEV shall be created to follow a Component hierarchy and display all the engineering attribute values for each Component and the related Cost and RMA elements

B. A MEV shall be created to follow DuplicateComponents 'includes duplicate' relation and display all the engineering attribute values for each DuplicateComponents, Component and the related Cost and RMA elements

6.0 Consistency Check Reports

Consistency check reports shall be created to verify the desired relations and attributes were created by the user. These checks are grouped into checksets. Table 4 lists the checksets and the tests to be performed for the CheckSetCatagory "Cost, RAM, & FMEA"

Table 4 Consistency check checksets

CHECKSET element	CHECKS
COMMON	**This checkset should be performed prior to running an Export Report**
ExternalToolFiles	At least one instance of the element type ExternalToolFiles exists
LifeCycleParameter	At least one instance of the element type LifeCycleParameter exists and has the "satisfied by" relation to a Component element with Component Type = System.
	All instances of a LifeCycleParameter element have a value in Operating Environment, Deployment Quantity, Mission Period, On Time Factor and Duration of Lifecycle. attributes. In addition, Deployment Quantity must be greater than zero
DuplicateComponents	All instances of DuplicateComponents elements have the "costs" relation to a Cost element, the "has rma of" to a RMA element and is related to more than one Component.
Components	All Components have a value for the Component Type attribute
	All Components that have the Duplicate - Used in other assemblies attribute set to Yes must have the "duplicates included by" relation to a DuplicateComponents element
	Components with Component Type attribute set to System, Segment, Facility and Subsystem must be decomposed.
	Components with the Component Type attribute not equal to Environment, External System, Task or Human: Are required to have Cost elements related by the relation "costs" Are required to have RMA elements related by the relation "has rma of" Are required to have a Quantity In Next Higher Assembly attribute > zero.
	Components at the lowest level with the Component Type attribute set to HWCI, HW Element or Part that have the Quantity Required for Operation attribute > 0 are required to have a value in the Redundancy Mode attribute.

Table 4 Consistency check checksets

CHECKSET element	CHECKS
COST	**This checkset should be performed prior to running an Export to Cost Report**
DuplicateComponents	All DuplicateComponents must have a value > 0 in the Total System Quantity attribute.
Cost	Purchased Item attribute must be > 0 when Design Source attribute is COTS or Modified COTS for the lowest level Components.
Component	Components at the lowest level with the Component Type attribute not equal to Environment, External System, Task or Human: A value is required for the Design Source attribute. When the Cost, Purchased Item attribute is > 0, Design Source must be set to COTS or Modified COTS. A value > 0 is required in the Percent of New Design attribute when Design Source is not equal to COTS, Reuse or Furnished.
	Components at the lowest level with the Component Type attribute equal to HWCI, HW Element or Part: Component Sub Type and Technology Maturity attributes must have values. Budgeted or predicted values of length, width, depth and weight attributes must be > 0. One of the five Technology/Equipment groups must have a value. When there is a value in one attribute of a Technology/Equipment group, all three must have values. If Equipment Type equals Structure, then Technology Type must equal None in any Technology/Equipment group. If Technology Type equals None, then Equipment type must equal Structure in any Technology/Equipment group. If Technology Type equals VLSI, then Equipment Type cannot equal Analog/RF, in any Technology/Equipment group. If Technology Type equals VHSIC, then Equipment Type cannot equal Analog Audio, Analog/RF, Transmitter, or Power Conditioning in any Technology/Equipment group.
	Components at the lowest level with the Component Type attribute equal to CSCI, CSC, CSU, FWCI, FWC or FWU: SLOC, Software Lines of Code, Percent of Memory Utilization, Percent of Processor Utilization, and Language attributes must have values > 0. At least one of the Types of Code attributes has a value > 0. If User Defined Type attribute has a value > 0, then Design Difficulty must have a value > 0. A value > 0 is required for Percent of New Code, when Design Source is not equal to COTS, Furnished or Reuse.
RAM Assessment	**This CheckSet should be performed prior to running the Export to RAM-ILS report.**
LifeCycleParameter	All instances of a LifeCycleParameter element have a value > 0 in Operational Environmental Temperature min and max attributes.
	All instances of LifeCycleParameter has a value in at least one of Availability (inherent), Availability (operational), or Reliability attributes.

Table 4 Consistency check checksets

CHECKSET element	CHECKS
RAM Optimization	**This CheckSet should be performed prior to running the Export to RAM -ILS report**
Cost	All Cost elements that have Production, Operational, or Support sensitivity values > 1 require values > 0 in the corresponding cost attributes,.
	Budgeted or predicted Production, Operational and Support costs are required for the Cost element related to the Component with Component Type set to System.
Component	All Component elements that have Volume, Weight, or Power sensitivity values > 1 require values > 0 in the corresponding attributes.
	The Component with Component Type set to System: Budgeted or predicted Power (max) or (avg) are required. Budgeted or predicted length, width, depth and weight are required
FMEA	**This CheckSet should be performed prior to running the Export to RAM -ILS report**
ItemLinks	All ItemLinks are required to “output from” and “input to” components.

7.0 Data export reports

Reports shall be created to produce files containing the elements, relations and attributes listed in Tables 5, 6 and 7 in formats specified in following sections.
The user is required to select the ASCII with no linefeeds option when initiating all export reports.

Table 5 Export file for Reality Toolset

ELEMENT TYPE	DATA ITEM	DATA ENTRY NAME	VALUE TYPE
Header	Image Name	Image Name	The word ”MODULE” followed by a string in quotes
Header	Date of Export	Date of Export	Open Parenthesis (“Date” = “actual date”
Header		User entered description.	“DESCRIPTION” = “user entered description”
Header	ExternalToolFiles	Element Type and Element name	“ExternalToolFiles” = “Element Name”) Close Parenthesis ;
Component		Element Type and Element name	RDD100 “Element Type Element Name “
	componentType	Component Type	CSC,CSCI,CSU,Environment,External System,Facility,Human,HWCI,HW Element,Part,Subsystem,System, System Segment,Task,FWCI, FWC,FWU,nil
	cqCompSub	Component Sub Type	High Level Assembly, Cabinet, Drawer, Enclosure, Multiple Board Assembly, Board, Module Backplane/Cabling, Power Supply, n/a, nil
	crquantity	Quantity in Next higher Assembly	integer
	ctquantityRqOper	Quantity Required for Operation (Enter Only to Indicate Redundancy)	integer
	cuRedunMode	Redundancy mode	“Operational, On Line replacement”, “Operational, Off Line replacement”, “Standby , On Line replacement”, “Standby, Off Line replacement”, nil
	cvlengthbudgeted	Length predicted (ft)	float
	cvlengthpredicted	Length budgeted (ft)	float
	cwidthbudgeted	Width predicted (ft)	float

Table 5 Export file for Reality Toolset

ELEMENT TYPE	DATA ITEM	DATA ENTRY NAME	VALUE TYPE
Component (continued)	cwidthpredicted	Width budgeted (ft)	float
	depthbudgeted	Depth predicted (ft)	float
	depthpredicted	Depth budgeted (ft)	float
	depthsensitivity	Volume Sensitivity	10,9,8,7,6,5,4,3,2,1,nil
	eweightbudgeted	Weight predicted (lb.)	float
	eweightpredicted	Weight budgeted (lb.)	float
	eweightsensitivity	Weight Sensitivity	10,9,8,7,6,5,4,3,2,1,nil
	fpowermaxpred	Power maximum predicted (watts)	float
	fpowermaxalloc	Power maximum budgeted (watts)	float
	fpoweravgpred	Power average predicted (watts)	float
	fpoweravgalloc	Power average budgeted (watts)	float
	fpoweravgsens	Power Sensitivity	10,9,8,7,6,5,4,3,2,1,nil
	kTechMature	Technology Maturity	State of the Art, Leading Edge, Mature, Obsolete,nil
	DuplicateComponents	DuplicateComponents name (If there is a relation to a DuplicateComponents element)	string 'unknown' is used for Name when item link has one connection missing
	Inputs from	Finds Component Target for each ItemLink 'input to' this Component Outputs "input from"=["Target Component Name","ItemLink Name"]	string 'unknown' is used for Name when item link has one connection missing
	Output to	Finds Component Target for each ItemLink 'output from' this Component Outputs "output to"=["Target Component Name","ItemLink Name"]	string 'unknown' is used for Name when item link has one connection missing
	executed on	Finds Component target for relation	string "executes" = "Target Component Name"
	built from (relation)	Points to the components the current component is made up from (the next lower assemblies)	text, the word "Module" and a string for component name; for each relation
	allocates (relation)	Used to determine if this component performs a critical function Lists all functions allocated to this component	"Function name" = "name of function" \\Function\\Critical = Yes or No
Cost (All attributes are preceded by:\\Cost Cost name\\		Used for Cost element identification This is not preceded by \\....\\	string "Cost Element Type" = "Cost element name"
	oProdAmortUnitp	Amortized Unit Production predicated	float
	oProdAmortUnitbud	Amortized Unit Production budgeted	float
	oProdUnitp	Unit Production predicted	float
	oProdUnitbud	Unit Production budgeted	float
	oTotalProdQty	Total Production Quantity	integer
	prodpred	Production cost predicted	integer
	prodbud	Production cost budgeted	integer

Table 5 Export file for Reality Toolset

ELEMENT TYPE	DATA ITEM	DATA ENTRY NAME	VALUE TYPE
Cost (continued)	prodsens	Production Cost Sensitivity	10,9,8,7,6,5,4,3,2,1,nil
	qOperpred	Operational cost predicted	integer
	qOperbud	Operational cost budgeted	integer
	qOpersens	Operational Cost Sensitivity	10,9,8,7,6,5,4,3,2,1,nil
	suppred	Support cost predicted	integer
	supbud	Support cost budgeted	integer
	supsens	Support Cost Sensitivity	10,9,8,7,6,5,4,3,2,1,nil
LifeCycleParameter (All Attributes are preceded by \\LifeCyclePara-meter LCP name\\) These attributes are only included at the highest assembly of interest		Used for LifeCycleParameter element identification This is not preceded by \\....\\	string "LifeCycleParameter Element Type" = "LifeCycleParameter element name"
	aOperEnvir	Operating Environment	Commercial Ground, Commercial Ground High Grade, Commercial Mobile, Commercial Airborne, Military Ground - Benign, Military Ground - Fixed, Military Mobile, Military Naval Sheltered, Military Naval Unsheltered, Military Airborne-inhabited cargo, Military Airborne-inhabited fighter, Military Airborne-uninhabited cargo, Military Airborne - uninhabited fighter, Military Airborne - rotary wing, Military Missile - flight, Military Missile - launch, Space Manned, Space Unmanned, nil
	aOperTempmax	Operational Environment Temperature Max (F)	float
	aOperTempmin	Operational Environment Temperature Min (F)	float
	availability	Availability (operational)	float
	availabilityI	Availability (inherent)	float
	bReliability	Reliability	float
	deploymentQuantity	Deployment Quantity	integer
	gMissionPeriod	Mission Period (hrs)	float
	hDurationLC	Duration of Lifecycle (years)	float
	iOnTimeFactor	On Time Factor (hrs per month)	float
	kaVol	Volume sensitivity	10,9,8,7,6,5,4,3,2,1

Table 5 Export file for Reality Toolset

ELEMENT TYPE	DATA ITEM	DATA ENTRY NAME	VALUE TYPE
LCP (continued)	kbWt	Weight sensitivity	10,9,8,7,6,5,4,3,2,1
	kcPwr	Power sensitivity	10,9,8,7,6,5,4,3,2,1
	kdProd	Production Cost sensitivity	10,9,8,7,6,5,4,3,2,1
	keOper	Operational Cost sensitivity	10,9,8,7,6,5,4,3,2,1
	kfSup	Support Cost sensitivity	10,9,8,7,6,5,4,3,2,1
RMA(All Attributes are preceded by \\RMA RMA name\\)		Used for RMA element identification This is not preceded by \\....\\	string “RMA Element Type” = “RMA element name”
	gfaultToler	Allow RMA Quantity Request	(Yes, No, nil) Default - nil
	hmtbcfbud	MTBCF budgeted (hr)	float
	hmtbfbud	MTBF budgeted (hr)	float
	iLRU	LRU, Line Replaceable Unit	(Yes, No)
	iMTTRbud	MTTR, line budgeted (hr)	float

Table 6 Export RDT file for PRICE Toolset

ELEMENT TYPE	DATA ITEM	DATA ENTRY NAME	VALUE TYPE
ROW 1	Header	Image name, Export date and User entered description	string
ROW 2 ExternalToolFiles	ExternalToolFiles name	ExternalToolFiles name	string
ROW 3	aCAfileReq	Cost Analyst File Requested	string
ROW 4	cSyncFileReq	Sync File Requested	string
ROW 5	dtLockReq	Lock Name Requested	string
ROW 6	Column titles	n/a	string
ROW 7 to n Component	Component	Element Type	string
	Component	Component	string
	componentType	Component Type	CSC,CSCI,CSU,Environment,External System,Facility,Human,HWCI,HW Element,Part,Subsystem,System, System Segment,Task,FWCI, FWC,FWU, nil,
	cqCompSub	Component Sub Type	High Level Assembly, Cabinet, Drawer, Enclosure, Multiple Board Assembly, Board, Module Backplane/Cabling, Power Supply, n/a, nil

Table 6 Export RDT file for PRICE Toolset

ELEMENT TYPE	DATA ITEM	DATA ENTRY NAME	VALUE TYPE
Component (continued)	cqDesign	Design Source	New, COTS, Furnished, Reuse, Modified COTS, Modified Furnished, Modified Reuse, nil
	cqdPercentNewDesign	Percent of New Design	integer
	cqDup	Duplicate - Used in other assemblies	Yes, no
	crquantityTotal	Total System Quantity (calculated) ONLY IF DUPLICATES EXIST	integer
	crquantity	Quantity in Next Higher Assembly	integer
	ctquantityRqOper	Quantity Required for Operation (Enter Only to Indicate Redundancy)	integer
	cuRedunMode	Redundancy Mode	“Operational, On Line replacement”, “Operational, Off Line replacement”, “Standby , On Line replacement”, “Standby, Off Line replacement”, nil
	cvlengthbudgeted	Length predicted (ft)	float
	cvlengthpredicted	Length budgeted (ft)	float
	cwidthbudgeted	Width predicted (ft)	float
	cwidthpredicted	Width budgeted (ft)	float
	depthbudgeted	Depth predicted (ft)	float
	depthpredicted	Depth budgeted (ft)	float
	eweightbudgeted	Weight predicted (lb.)	float
	eweightpredicted	Weight budgeted (lb.)	float
	kTechMature	Technology Maturity	State of the Art, Leading Edge, Mature, Obsolete,nil
	m1Tech1	Technology Type 1	Discrete, SSIC, MSIC, LSI, VLSI, VHSIC, None, nil
	m2Equip1	Equipment Type 1	Analog Audio, Analog RF/Video, Digital, Display, Display no CRT, Transmitter, Power Conditioning, Structure, nil
	m3Percent1	Percent of Technology and Equipment 1	integer
	m4Tech2	Technology Type 2	Discrete, SSIC, MSIC, LSI, VLSI, VHSIC, None, nil
	m5Equip2	Equipment Type 2	Analog Audio, Analog RF/Video, Digital, Display, Display no CRT, Transmitter, Power Conditioning, Structure, nil
	m6Percent2	Percent of Technology and Equipment 2	integer

Table 6 Export RDT file for PRICE Toolset

ELEMENT TYPE	DATA ITEM	DATA ENTRY NAME	VALUE TYPE
Component (continued)	m7Tech3	Technology Type 3	Discrete, SSIC, MSIC, LSI, VLSI, VHSIC, None, nil
	m8Equip3	Equipment Type 3	Analog Audio, Analog RF/Video, Digital, Display, Display no CRT, Transmitter, Power Conditioning, Structure, nil
	m90Percent3	Percent of Technology and Equipment 3	integer
	m91Tech4	Technology Type 4	Discrete, SSIC, MSIC, LSI, VLSI, VHSIC, None, nil
	m92Equip4	Equipment Type 4	Analog Audio, Analog RF/Video, Digital, Display, Display no CRT, Transmitter, Power Conditioning, Structure, nil
	m93Percent4	Percent of Technology and Equipment 4	integer
	m94Tech5	Technology Type 5	Discrete, SSIC, MSIC, LSI, VLSI, VHSIC, None, nil
	m95Equip5	Equipment Type 5	Analog Audio, Analog RF/Video, Digital, Display, Display no CRT, Transmitter, Power Conditioning, Structure, nil
	m96Percent5	Percent of Technology and Equipment 5	integer
	n10SLOC	SLOC, Source Lines of Code	integer
	n11UtilMem	Percent of Memory Utilization	integer
	n12UtilProc	Percent of Processor Utilization	integer
	n13Lang	Language	ADA83, ADA95, C, C++, Assembly, Micro Code, Machine, VHDL, High Order, Interpretive, ATLAS, Mixed, n/a)
	n14NewCode	Percent New Code	float
	n17Math	Mathematics (1)	integer
	n18String	String Manipulation (2)	integer
	n19Store	Store and Retrieve (4)	integer
	n20Online	Online Communications (6)	integer
	n21Real	Real Time (8)	integer
	n22Inter	Operating System or Interactive (10)	integer
	n24User	User Defined Type (value below)	integer
	n25UserDD	Design Difficulty Value for User Defined Type	nil, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10
	Component name of the Next Higher Assembly	Component Target of the built in relation	string
	Component decomposed	Determined by testing for built from relation	Yes, No

Table 6 Export RDT file for PRICE Toolset

ELEMENT TYPE	DATA ITEM	DATA ENTRY NAME	VALUE TYPE
Cost	Cost element name	Cost Element Name	string
	cPurchased	Purchased Item cost	float
	developBud	Development cost budgeted	integer
	prodbud	Production cost budgeted	integer
	supbud	Support cost budgeted	integer
RMA	RMA Element Name	RMA Element Name	string
	ggavailpred	Availability predicted	float
	hmtbcfpred	MTBCF predicted (hr)	float
	hmtbcfbud	MTBCF budgeted (hr)	float
	hmtbfpred	MTBF predicted (hr)	float
	hmtbfbud	MTBF budgeted (hr)	float
	iLRU	LRU, Line Replaceable Unit	Yes, No
	iMainPRICE	Maintenance Concept Requested for Costing Discard LRU at failure Replace mods at ORG. Scrap bad mods. Replace mods at INT. Scrap bad mods. Replace mods at DPT. Scrap bad mods. Replace mods at ORG. Repair mods at INT. Replace mods at ORG. Repair mods at DPT. Replace parts at INT. Replace mods at INT. Repair mods at DPT. Replace parts at DPT. Replace parts at ORG. Replace mods at EQP. Scrap bad mods. Replace mods at EQP. Repair mods at ORG. Replace mods at EQP. Repair mods at INT. Replace mods at EQP. Repair mods at DPT. Replace mods at contractor. Scrap bad mods. Replace mods at EQP. Repair mods at contractor. Replace mods at ORG. Repair mods at contractor. Replace mods at INT. Repair mods at contractor. Replace parts at contractor. Recheck LRU at ORG. Scrap bad LRU. Recheck LRU at ORG. Replace mods at INT. Scrap bad mods. Recheck LRU at ORG. Replace mods at DPT. Scrap bad mods. Recheck LRU at ORG. Replace parts at INT. Recheck LRU at ORG. Replace mods at INT. Repair mods at DPT. Recheck LRU at ORG. Replace parts at DPT. Recheck LRU at ORG. Replace mods at contractor. Scrap bad mods. Recheck LRU at ORG. Replace mods at INT. Repair mods at cont. Recheck LRU at ORG. Replace parts at contractor. nil	<------ Data List
	iMTTRpred	MTTR, line predicted (hr)	float
	iMTTRbud	MTTR, line budgeted (hr)	float
	k10LRUorgTf	MTTR, LRU ORG (Tf)	float
	k11MosOrgTmo	MTTR, Module ORG (Tmo)	float

Table 6 Export RDT file for PRICE Toolset

ELEMENT TYPE	DATA ITEM	DATA ENTRY NAME	VALUE TYPE
RMA (continued)	k12LRUILTi	MTTR, LRU IL (Ti)	float
	k13ModILTmi	MTTR, Module IL (Tmi)	float
	k14LRUdepotTd	MTTR, LRU Depot (Td)	float
	k15ModDepotTmd	MTTR, Module Depot (Tmd)	float
LifeCycleParameter These attributes are only included at the highest assembly of interest	LifeCycleParameter Element Name	LifeCycleParameter Element Name	string
	aOperEnvir	Operating Environment	Commercial Ground, Commercial Ground High Grade, Commercial Mobile, Commercial Airborne, Military Ground - Benign, Military Ground - Fixed, Military Mobile, Military Naval Sheltered, Military Naval Unsheltered, Military Airborne-inhabited cargo, Military Airborne-inhabited fighter, Military Airborne-uninhabited cargo, Military Airborne - uninhabited fighter, Military Airborne - rotary wing, Military Missile - flight, Military Missile - launch, Space Manned, Space Unmanned, nil
	deploymentQuantity	Deployment Quantity	integer
	eProtoQuantity	Prototype Quantity	integer
	gMissionPeriod	Mission Period (hrs)	float
	hDurationLC	Duration of Lifecycle (years)	float
	iOnTimeFactor	On Time Factor (hrs per month)	float

NOTE: Duplicate and system deployment handling.

1. The Total System Quantity line item has a value only when the Component element is related to a DuplicateComponents element.

2. The attribute Total System Quantity (in DuplicateComponents element) will have a calculated value. Each component related to the DuplicateComponents element will have its' Qty NHA multiplied by that components NHAs' Qty NHA, etc. The Deployment quantity attribute of the LifeCycleParameter element will be the last multiplier in the hierarchy. This calculation will be done for each branch of the hierarchy containing a Component related to the DuplicateComponents. Each components total will be summed to produce the Total System Quantity.

3 The LifeCycleParameter(LCP) Deployment Quantity shall be used as a quantity multiplier for the System and the LifeCycleParameter must be related to the Component with Component Type is System.

4. Total Production Quantity is an attribute originating from PRICE and may include spares.

Table 7 Export file for JRS Toolset

ELEMENT TYPE	DATA ITEM	DATA ENTRY NAME	VALUE TYPE
ROW 1 Header	Image Name	Image Name	string
ROW 2 Header	Date of Export	Date of Export	string
ROW 3 Header		User entered description.	string
ROW 4 Component	Component name	Element Type and Element name	string
ROW 5 thru n	cvlengthbudgeted	Length predicted (ft)	float
	cvlengthpredicted	Length budgeted (ft)	float
	cwidthbudgeted	Width predicted (ft)	float
	cwidthpredicted	Width budgeted (ft)	float
	depthbudgeted	Depth predicted (ft)	float
	depthpredicted	Depth budgeted (ft)	float
	depthsensitivity	Volume Sensitivity	10,9,8,7,6,5,4,3,2,1,nil
	eweightbudgeted	Weight predicted (lb.)	float
	eweightpredicted	Weight budgeted (lb.)	float
	eweightsensitivity	Weight sensitivity	10,9,8,7,6,5,4,3,2,1,nil
	fpowermaxpred	Power maximum predicted (watts)	float
	fpowermaxalloc	Power maximum budgeted (watts)	float
	fpoweravgpred	Power average predicted (watts)	float
	fpoweravgalloc	Power average budgeted (watts)	float
	fpoweravgsens	Power Sensitivity	10,9,8,7,6,5,4,3,2,1,nil
	developPred	Development cost predicted	integer
	developBud	Development cost budgeted	integer
	prodpred	Production cost predicted	integer
	prodbud	Production cost budgeted	integer
	prodsens	Production cost sensitivity	10,9,8,7,6,5,4,3,2,1,nil
	qOperpred	Operational cost predicted	integer
	qOperbud	Operational cost budgeted	integer
	qOpersens	Operational cost sensitivity	10,9,8,7,6,5,4,3,2,1,nil
	suppred	Support cost predicted	integer
	supbud	Support cost budgeted	integer
	supsens	Support cost sensitivity	10,9,8,7,6,5,4,3,2,1,nil
	hmtbcfpred	MTBCF predicted (hr)	float
	hmtbcfbud	MTBCF budgeted (hr)	float
	hmtbfpred	MTBF predicted (hr)	float
	hmtbfbud	MTBF budgeted (hr)	float
for each input	InputName	Data input Name	string
for each input	harrivalRateavg	Arrival Rate average (words/sec)	float
for each input	harrivalRatepk	Arrival Rate peak (words/sec)	float

JRS export report notes:

1. Only one component is exported to JRS for each report execution.

2. Input Definition - Inputs are determined by following the allocates relationship from the selected component. All the functions that have been allocated are examined for inputs and outputs, then any input that is also an output from any allocated function is eliminated from the list. This results in a list of external inputs to the selected component.

8.0 Data import

Data to be imported into RDD-100 shall be in RDD's standard RDT file format. The description of this format can be found in the RDD-100 Utility, Multi-User Merge manual included in the RDD-100, version 4.0.3 documentation set.

The following section describes a modified format that can be used to update element attributes and will circumvent RDD-100 ownership constraints. This format should only be used for changing attribute values.

Expected input from the PRICE, Reality and JRS toolsets is listed in Tables 8, 9 & 10 .

Table 8 Import RDT file for Reality Toolset

ELEMENT TYPE	ATTRIBUTE USER ENTRY NAME	ATTRIBUTE NAME	DATA TYPE
Component	Element name		string
	Quantity Requested for RMA	csquantityRMA	integer
ExternalToolFiles	Element name		string
	RAM-ILS Directory Used	eRAMfileUsed	string
RMA	Element name		string
	Availability predicted	ggavailpred	float
	Reliability predicted	grelpred	float
	MTBCF predicted	hmtbcfpred	float
	Optimized MTBF (hr)	hmtbfopt	float
	MTBF Optimization Criteria	hmtbfoptc	string
	MTBF predicted (hr)	hmtbfpred	float
	Method used for MTBF predicted	hmtbfpredmeth	string
	Maintainability Procedure	iMain	string
	MTTR, line predicted (hr)	iMTTRpred	float
	MTTR, LRU ORG (Tf)	k10LRUorgTf	float
	MTTR, Module ORG (Tmo)	k11MosOrgTmo	float
	MTTR, LRU IL (Ti)	k12LRUILTi	float
	MTTR, Module IL (Tmi)	k13ModILTmi	float
	MTTR, LRU Depot (Td)	k14LRUdepotTd	float
	MTTR, Module Depot (Tmd)	k15ModDepotTmd	float
OPTIONAL			
CriticalIssue	Element name		symbol
	Description	description	string
	Relation = traces from	Target element = Component	
	Relation = traces from	Target element = RMA	
Comment	Element name		symbol
	Description	description	string
	Relation = annotates	Target element = Component	
	Relation = annotates	Target element = RMA	

Critical issues and Comments are related to elements they address, in this case, both Component and RMA. Therefore the Component or RMA name has to be known. In addition the CriticalIssue and Comment elements must be uniquely named. There can be multiple critical issues related to a single element or a single CriticalIssue related to many RMA or Component elements.

Table 9 Import RDT file for PRICE Toolset

ELEMENT TYPE	ATTRIBUTE USER ENTRY NAME	ATTRIBUTE NAME	DATA TYPE
Cost	Element name		string
	Development cost predicted	developPred	float/integer *
	Amortized Unit Production predicted	oProdAmortUnitp	float
	Unit Production predicted	oProdUnitp	float
	Total Production Quantity	oTotalProdQty	integer
	Production cost predicted	prodpred	float/integer *
	Support cost predicted	suppred	float/integer *
ExternalToolFiles	Element name		
	Cost Analyst File Used	bCAfileUsed	
	Sync File Used	dSyncFileUsed	string
	Lock Name Used	duLockUsed	string
RMA	Element name		string
	Maintenance Concept Used for Costing	iMainPused	string
OPTIONAL			
CriticalIssue	Element name		string
	Description	description	string
	Relation = traces from	Target element = Component	
	Relation = traces from	Target element = Cost	
Comment	Element name		symbol
	Description	description	string
	Relation = annotates	Target element = Component	
	Relation = annotates	Target element = Cost	

***** Note: Float inputs will be truncated at the decimal point for these attributes.

Critical issues and Comments are related to elements they address, in this case, Cost. Therefore the Cost name has to be known. In addition the CriticalIssue and Comments elements must be uniquely named. There can be multiple critical issues or Comments related to a single element or a single CriticalIssue or Comment related to many Cost elements.

Table 10 Import RDT file for JRS Toolset

ELEMENT TYPE	ATTRIBUTE USER ENTRY NAME	ATTRIBUTE NAME	DATA TYPE
OPTIONAL			
CriticalIssue	Element name		symbol
	Description	description	string
	Relation = traces from	Target element = Component	

Note: Critical issues are related to elements they address, in this case, Component. Therefore the Component name has to be known. In addition the CriticalIssue elements must be uniquely named. There can be multiple critical issues related to a single element.

8.1 RDT file format, modified

The file is composed of statements delimited by semicolons. Statements are composed of keywords and values. Statements are format free; they do not have to be positioned at any particular point on the line. Any number of intervening spaces or tab characters may be inserted for readability. Line feeds and carriage returns are likewise ignored implying that several statements may be entered on one line. In general non printable characters are not ignored.

All keywords, element types and attributes are case sensitive and must be included as specified.

File Structure

The file is divided into “chunks” for parsing, the delimiter for a chunk is an exclamation character “!”.
The chunks to be included in the file consist of the file comment line plus the preface as the first chunk followed by any number of chunks each representing one element and its attributes.

Attributes

Attribute values have various data types that use different delimiters. The subset referenced in the preceding tables use the delimiters defined as follows:

Element Type - none
Element name - backslash (\name\)
float - none, but must include decimal point followed by at least one zero (4.0)
integer - none (Note: must not include a decimal point)
strings, text and dates - single quote (‘This can be any text or string’) NOTE: when a single quote is used in the textual content, it must be preceded by a single quote. i.e. don’t = don’’t
symbols (usually enumerated lists) - backslash (\High Level Assembly\)

Attributes having no value shall not be included in the file unless the intention is to give a 0 or nil value to the attribute. In that case the value of the attribute shall be “nil” or 0 depending on data type. Note, “nil” can be used to give a blank or nothing value to any attribute. The value “nil” is a keyword and does not require delimiters.

Attribute values that have not changed generally should not be included in the file as it will give a false indication that the value has changed.

NOTE: When backslashes are used no extra spaces are permitted between the backslashes.

Relations

When relations are included with the element, the keyword ‘relations’ is added after the last attribute. This is followed by the relationship name, an equal sign, the action keyword ‘assign’ followed by the element type and name of the target element.

Underscores replace spaces for relationship names containing more than one word.

New Elements

When a new element is specified, such as a CriticalIssue, a create statement is required. Create statement(s) must follow the preface and precede any Element attribute or relation entries.

This statement has the form: create Element Type \Element Name\ ; !

Detailed File Contents

The first line of the file is optional and is a comment line for file identification.

Two dashes must proceed the comment. It is recommended the line contain the tool name that originated the file, the date and the time.
Example:

-- From *tool name* on 24 February 1995 at 5:52: 45 pm

The next six lines are mandatory.

preface
version = 3.1;
format = incremental;
schema = methodology;
owner = unchanged;
end preface; !

The remainder of the file contains elements and their attributes in the following form for each element.

Note the asterisk before each value is necessary for the change to be included in RDD-100 history which is used to determine how certain exports are handled.

Element Type \Element Name\
attributes
attribute name = * attribute value;
...
attribute name = * attribute value;

relations
    relationship name =
        assign Element Type \Element Name\, Element Type \Element Name\;
end Element Type; !

Example shows multiple targets for a relationship, note the delimiter between targets is a “comma”.

Note the first statement line is considered to be from Element Type to the end of the first attribute value. This is also true for the first relation statement. (end of statement delimited by semi colon)

Example files:

-- From *tool name* on 24 February 1995 at 5:52: 45 pm

```
preface
version = 3.1;
format = incremental;
schema = methodology;
owner = unchanged;
end preface; !

Component \Signal Processor\
attributes
crquantity =* 4;
kTech = * \Digital LSI\;
fpoweravgalloc = * 4.0;
description = *‘Text that describes the component’;
end Component; !

Component \Module a\
attributes
crquantity = *7;
end Component;!

Cost\Signal Processor\
attributes
oProdUnit = * 3400.00;
end Cost;!
```

Sample of new CriticalIssue with relation

-- From *tool name* on 24 February 1995 at 5:52: 45 pm

```
preface
version = 3.1;
format = incremental;
schema = methodology;
owner = unchanged;
end preface; !

create CriticalIssue \Performance\;!

CriticalIssue\Performance\
attributes
description = *‘Text that describes the issue’;
relations
        traced_from =
                assign Component \Signal Processor\,RMA\Signal Processor\;
end CriticalIssue; !
```

Note: Blank lines and spaces included for readability are optional.

9.0 Utility Reports

9.1 Add Cost and RMA elements

A report shall be created to add Cost and RMA elements for every Component and DuplicateComponents element. In addition the appropriate relations shall be made from each Component and DuplicateComponents element to the newly created Cost and RMA elements.

The user shall be able to select all Component/DuplicateComponents in the data base selected instances of Component/DuplicateComponents elements or the starting Component of hierarchy.

The user shall be able to select only RMA elements, only Cost elements or both elements are to be created.

The user shall be able to select whether an existing name remain unchanged or the name of the Component/DuplicateComponents be used for the name of existing Cost and RMA elements.

9.2 Delete Cost and RMA elements

A report shall be created to delete Cost and RMA elements that do not have a costs or 'rma for' relationship, respectively. This report will check all Cost and RMA elements in the database.

On initiating the report the user shall be presented the option of proceeding with the deletions or cancel the report without making any changes.

The user shall be presented the options of deleting only Cost, only RMA or both element types.

9.3 Calculate Total System Quantity

A report shall be created to calculate the quantity for the Total System Quantity attribute of the DuplicateComponents element. The calculation shall reflect the total quantity used in the system determined as follows:

for all Component elements related to a DuplicateComponents element, the sum of each Components' Quantity in Next Higher Assembly attribute multiplied by that Components' parents Quantity in Next Higher Assembly attribute, this will continue until a Component element having the Component Type attribute set to System. The Deployment quantity attribute in the LifeCycleParameter element will be used as the last multiplier. When all hierarchical branches containing a Component related to a specific DuplicateComponents element have been calculated and summed the value shall be entered into the DuplicateComponents Total System Quantity attribute.

Zero and missing quantities are considered errors, the total system quantity is set to 0 and the errors are listed in the report output file. If the LifeCycleParameter elements deployment quantity is nil or zero or the component with Component Type attribute is System is not related to a LifeCycleParameter, an error is listed and a deployment quantity of 1 is assumed.

The user shall be able to select whether the calculation is performed for selected, all DuplicateComponents element(s) or cancel the report..

9.4 Set Duplicate Attribute

A report shall be created to check Component elements for the ‘duplicates included by’ relation. If the relation exists this report shall set the “Duplicate - used in other assemblies’ attribute to ‘Yes”, otherwise it will remain unchanged.

The user shall be able to select all Component, selected Component, all DuplicateComponents, selected DuplicateComponents elements or Cancel the report.

9.5 Reconcile Duplicates

A report shall be created to compare attributes of Components that are targets of DuplicateComponents. If the attributes are equal the attribute shall be entered into the DuplicateComponents element or its related Cost or RMA elements.

Nil shall be entered into the DuplicateComponents element or its related Cost or RMA elements if any attribute is not equal.

Development, Production, Support costs and Total Production Quantity shall be summed and the total entered in the DuplicateComponents related Cost element.

Options to exclude Support costs (to prevent error messages due to lack of RMA data) and to choose all or a subset of DuplicateComponents elements are provided.

The intended result is that DuplicateComponents and related Cost and RMA elements will contain values for only those attributes that are identical in its target Components and related Cost and RMA elements.
The exceptions are Development, Production, and Support predicted costs and Total Production Quantity which will contain the sum of all the target Components Costs attributes.

This report shall also detect and output the following error conditions;

DuplicateComponents that have less than one target Component, no Cost or no RMA targets

Target Components that have no Cost or RMA targets.

9.6 Print Three Element Attributes

A report shall be created to print all attributes of a Component or DuplicateComponents element and all attributes of the related Cost and RMA elements on a single page.

The user shall be able to select all, a selected mix of Components and DuplicateComponents or a selected Component hierarchy.

9.7 Print DuplicateComponents Targets

A report shall be created to print all attributes of a selected set of DuplicateComponents element(s) with up to five related Component element attributes on a single page. The report shall also print all attributes of the related Cost and RMA elements for the DuplicateComponents and the five Component elements on the two following pages. If there are more than five related Components, this report shall print the attributes on the following pages, one each for Components, Cost and RMA elements. In all cases the DuplicateComponents element or its related Cost or RMA element shall be printed in column one of each page.

The user shall be able to select printing of all attributes for related Components only or all attributes for related Components and all attributes for both Cost and RMA, Cost only, or RMA only.

9.8 Set Maintenance Concept to nil

A report shall be created to set the Maintenance Concept Requested for Costing attribute of the RMA element to nil. Access to the RMA elements shall be by choosing all, a hierarchy or specific Components.

Appendix A RDD to MSI file format

Included for completeness is the Email used as the specification for the RDD to MSI file format
The following is a spec for the MSI-RDD100 interface format. It is a boiled down version of my Mentor spec. Please let me know if it is not clear.

1. Terms

Component : A leaf node in a tree. An component is considered atomic, that is it does not contain other components.

Module : A collection of components or of modules. Either a branch or root node of a tree.

Identifier : A combination of a letter, followed by any combination of letters, numbers, and underscores. If it is necessary to use any other characters, you must place the identifier in quotes. (E.g. "Allocated MTBF"). Case is significant.

Terminator : All data lines are terminated with a semi-colon ';' character. This means that you may split your inpu across multiple lines if it makes things easier for you.

Property : You are familiar with this as "Attribute". It is a key word and a data value.

2. Comments and annotations

Comments are allowed anywhere within the input file. Comments are of the form found in the C programming language.

Example :

```
/* This is a legal comment */

/* This is a also
** a legal comment
*/
```

3. Document format

Each design is introduced to the translator with a MODULE statement, and terminated with an END_MODULE stater
The format of the MODULE statement is the word MODULE, followed by a unique name for the design, followed by a property list (see the Data Format section of this document for a description of property lists), followed by a terminato
The properties for the design might be such things as revision date, copyright, etc.

Example :

```
MODULE sample_design () ;
MODULE rdd100_2_msi (COPYRIGHT="(C) 1994" LAST_REVISED="1/1/94") ;
```

Names must be unique within the scope of a single translation, meaning that if you intend to pass two or more desigr through the translator at one time, each design must have a unique name.

A single data transfer document may contain more than one design. While this will probably not be relevant to RDD100, you may find it useful at some point.

3.1 Section headers

Following the design header are sections of data. Sections relevant to RDD are MODULES and COMPONENTS. I i
modify the translator to figure
out which modules are leaf nodes, and dynamically redefine those nodes to
COMPONENT status. This means you do not have to worry about COMPONENTS sections, but I will give
examples of them anyway.

Sections do not need to appear in any given order, and each section may
appear any number of times.

I will defer examples of sections until after the data format section.

4. General data format for all other data in a design

All data objects are defined by a class name, followed by an identifier,
followed by a list of properties.

Class Names

Class names define the kind of object or container being described. All
objects in an RDD100 transfer shall be given a class of RDD100.

Identifiers

Identifiers are used to give a unique name to an object.

Property List

A property list begins with an open parenthesis, a blank separated list of properties, and ends with a close parenthesis. A property list may be empty, in which case the open and closing parenthesis are still required (E.g. ()).

Properties

A property is defined as a property name, an equal sign '=', and a property
value.

Property Values

Property values may be strings, numbers, or vectors. Strings are enquoted with double quote "". For convenience, numbers may also be enquoted. Vectors are introduced by an open bracket '[', and terminated by a close bracket']'. Vectors may be nested.

Examples :

Class Name :

```
RDD100
```

Identifier

```
EXAMPLE1
PETER
```

Property :

```
NAME = "A"
AGE = 30
AGE = "30"
FAVORITE_COLORS = ["RED" "GREEN" "BLUE"]
```

Property list :

```
( MTTR=.4 NAME="A" FAVORITE_COLORS=["RED" "GREEN" "BLUE"] )
```

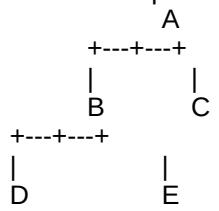
Empty property list :

```
()
```

Class name with object identifier and property list
RDD100 EXAMPLE1 (AGE="10" NAME="A" COLORS=["RED" "GREEN" "BLUE"]) ; RDD100 PETER (AGE=30
NAME="Peter Blemel" COLORS=["RED" "GREEN" "BLUE"]) ; RDD100 RICK ( ) ;

5. Document examples :

Consider the following module / component diagram "example_1" :



The following are examples of expressing this

```
MODULE example_1 (AUTHOR="Peter Blemel" LAST_REVISION="2/12/94") ;
COMPONENTS
RDD100 D ( "MTTR"=3000 NAME="D" ) ;
RDD100 E ( "MTTR"=3000 NAME="E" ) ;
MODULES
RDD100 B ( "NAME"="B" "MTTR"="6000") MODULE D MODULE E ; COMPONENTS
RDD100 C ( "NAME"="C" "MTTR"="3000") ;
MODULES
RDD100 A ( "NAME"="A" "MTTR"="9000") MODULE B MODULE C ; END_MODULE
```

Or, without using COMPONENT sections :

```
MODULE example_1 (AUTHOR="Peter Blemel" LAST_REVISION="2/12/94") ; MODULES
RDD100 D ( "MTTR"=3000 NAME="D" ) ;
RDD100 E ( "MTTR"=3000 NAME="E" ) ;
RDD100 B ( "NAME"="B" "MTTR"="6000") MODULE D MODULE E ;
RDD100 C ( "NAME"="C" "MTTR"="3000") ;
RDD100 A ( "NAME"="A" "MTTR"="9000") MODULE B MODULE C ;
END_MODULE
```

6. Naming conventions for properties table data values.
As we discussed, MSI software requires that unique properties be given unique names. For properties that are the result of a table relationship, include a unique prefix such as the table name as a prefix to the property name.

Example :

```
RDD100 A ( "NAME"="A" "/RAM/AAA/MTTR"="9000") MODULE B MODULE C ;
```

Appendix B RDD to MSI Sample File

The following was generated by RDD. (edited)

MODULE "4.1.1Rickv33a_A" ("Date"="7 November 1996" "DESCRIPTION"="Final: v33a Export   beta2" "ExternalToolFiles"="external tool template") ;
MODULES
RDD100 "Component Benchmark 1 SAR - Candidate A" ("componentType"="System" "cqCompSub"="High Level Assembly" "crquantity"="1" "cvlengthbudgeted"="1.458" "cwidthbudgeted"="0.854" "depthbudgeted"="0.875" "eweightbudgeted"="60.0" "fpoweravgalloc"="500.0" "kTechMature"="Leading Edge" "COST ELEMENT TYPE"="Benchmark 1 SAR - Candidate A" "RMA ELEMENT TYPE"="Benchmark 1 SAR - Candidate A" "\\RMA Benchmark 1 SAR - Candidate A\\gfaultToler"="No" "\\RMA Benchmark 1 SAR - Candidate A\\hmtbfbud"="2400.0" "\\RMA Benchmark 1 SAR - Candidate A\\iLRU"="No" "LIFECYCLEPARAMETER ELEMENT TYPE"="Benchmark 1 SAR" "\\LifeCycleParameter Benchmark 1 SAR\\aOperEnvir"="Military Mobile" "\\LifeCycleParameter Benchmark 1 SAR\\aOperTempmax"="140.0" "\\LifeCycleParameter Benchmark 1 SAR\\aOperTempMin"="41.0" "\\LifeCycleParameter Benchmark 1 SAR\\availability"="0.996" "\\LifeCycleParameter Benchmark 1 SAR\\availabilityI"="0.99989" "\\LifeCycleParameter Benchmark 1 SAR\\deploymentQuantity"="500" "\\LifeCycleParameter Benchmark 1 SAR\\gMissionPeriod"="20.0" "\\LifeCycleParameter Benchmark 1 SAR\\hDurationLC"="20.0" "\\LifeCycleParameter Benchmark 1 SAR\\iOnTimeFactor"="100.0" "\\LifeCycleParameter Benchmark 1 SAR\\kaVol"="10" "\\LifeCycleParameter Benchmark 1 SAR\\kbWt"="10" "\\LifeCycleParameter Benchmark 1 SAR\\kcPwr"="10" "\\LifeCycleParameter Benchmark 1 SAR\\kdProd"="10" "\\LifeCycleParameter Benchmark 1 SAR\\keOper"="10" "\\LifeCycleParameter Benchmark 1 SAR\\kfSup"="10") MODULE "Component Backplane Assembly" MODULE "Component Data I/O Assembly" MODULE "Component Processing Element Assembly" MODULE "Component Host Interface Assembly" MODULE "Component Chassis" ;
MODULES
RDD100 "Component Data I/O Assembly" ("componentType"="HW Element" "cqCompSub"="Multiple Board Assembly" "crquantity"="1" "cuRedunMode"="Operational, Off Line replacement" "cvlengthbudgeted"="0.525" "cwidthbudgeted"="0.125" "depthbudgeted"="0.767" "eweightbudgeted"="4.0" "fpoweravgalloc"="30.0" "kTechMature"="Leading Edge" "Input from"=["Signal Processing Firmware","Report Data Link 2"] "Input from"=["ADTS Platform","Sensor Data Link"] "Output to"=["ADTS Platform","Processed Output Data Link"] "Output to"=["Signal Processing Firmware","Report Data Link"] "Output to"=["Signal Processing Firmware","Separated Sensor Data Link"] "Output to"=["ADTS Platform","Separated Sensor Data Link 2"] "COST ELEMENT TYPE"="Data I/O Assembly" "\\Cost Data I/O Assembly\\prodsens"="1" "\\Cost Data I/O Assembly\\supsens"="1" "RMA ELEMENT TYPE"="Data I/O Assembly" "\\RMA Data I/O Assembly\\gfaultToler"="Yes" "\\RMA Data I/O Assembly\\hmtbfbud"="10000.0" "\\RMA Data I/O Assembly\\iLRU"="No") MODULE "Component Data I/O Module" MODULE "Component Fiber Optic Interface" MODULE "Component FIR Daughter Card" ;
COMPONENTS
RDD100 "Component Fiber Optic Interface" ("componentType"="HW Element" "cqCompSub"="Board" "crquantity"="1" "cvlengthbudgeted"="0.417" "cwidthbudgeted"="0.0625" "depthbudgeted"="0.3125" "eweightbudgeted"="0.6" "fpoweravgalloc"="10.0" "kTechMature"="Mature" "COST ELEMENT TYPE"="Fiber Optic Interface" "RMA ELEMENT TYPE"="Fiber Optic Interface" "\\RMA Fiber Optic Interface\\gfaultToler"="No" "\\RMA Fiber Optic Interface\\hmtbfbud"="30000.0" "\\RMA Fiber Optic Interface\\iLRU"="Yes" "\\RMA Fiber Optic Interface\\iMTTRbud"="1.0" "Function Name"="Video to Baseband I/Q Conversion""\\Function\\Critical"="Yes");
COMPONENTS
RDD100 "Component PE Daughterboard" ("componentType"="HW Element" "cqCompSub"="Board" "crquantity"="2" "cvlengthbudgeted"="0.454" "cwidthbudgeted"="0.0625" "depthbudgeted"="0.358" "depthsensitivity"="10" "eweightbudgeted"="0.4" "eweightsensitivity"="10" "fpowermaxsens"="7" "fpoweravgalloc"="10.0" "kTechMature"="Mature" "DuplicateComponents"="Fam 1" "COST ELEMENT TYPE"="PE Daughterboard" "\\Cost PE Daughterboard\\oProdUnitbud"="11000.0" "\\Cost PE Daughterboard\\oTotalProdQty"="40.0" "\\Cost PE Daughterboard\\qOperbud"="40" "\\Cost PE Daughterboard\\qOpersens"="5" "\\Cost PE Daughterboard\\supbud"="45000" "\\Cost PE Daughterboard\\supsens"="8" "RMA ELEMENT TYPE"="PE Daughterboard" "\\RMA PE Daughterboard\\gfaultToler"="No" "\\RMA PE Daughterboard\\hmtbfbud"="50000.0" "\\RMA PE Daughterboard\\iLRU"="Yes" "\\RMA PE Daughterboard\\iMTTRbud"="1.0" "Function Name"="Range DFT""Function Name"="Equalization Weight""Function Name"="Form Frame""Function Name"="Form Report""Function Name"="Kernel Multiplication""Function Name"="RCS Calibration""Function Name"="Form Processing Array""Function Name"="Range Processing""Function Name"="Azimuth DFT""Function Name"="Azimuth Compression""Function Name"="Azimuth IDFT""Function Name"="Convert to Floating Point""\\Function\\Critical"="Yes");
COMPONENTS
RDD100 "Component Host Interface Module" ("componentType"="HW Element" "cqCompSub"="Board" "crquantity"="1" "cuRedunMode"="Operational, Off Line replacement" "cvlengthbudgeted"="0.525" "cwidthbudgeted"="0.0625" "depthbudgeted"="0.767" "eweightbudgeted"="1.8" "fpoweravgalloc"="20.0" "kTechMature"="Mature" "Input from"=["ADTS Platform","Hardware Command Link"] "Input from"=["Command Program","Command Program Outputs"] "Input from"=["Control Program","Firmware to RS-232 Link"] "Output to"=["Command Program","Command Program Inputs"] "Output to"=["ADTS Platform","Hardware Response Link"] "COST ELEMENT TYPE"="Host Interface Module" "RMA ELEMENT TYPE"="Host Interface Module" "\\RMA Host Interface Module\\gfaultToler"="Yes" "\\RMA Host Interface Module\\hmtbfbud"="75000.0" "\\RMA Host Interface Module\\iLRU"="Yes" "\\RMA Host Interface Module\\iMTTRbud"="1.0" "Function Name"="Send Diagnostic Response""Function Name"="Receive External Control""Function Name"="Host Interface Platform Functions""\\Function\\Critical"="Yes");
MODULES
RDD100 "Component Host Interface Assembly" ("componentType"="Subsystem" "cqCompSub"="Board" "crquantity"="1" "cvlengthbudgeted"="0.525" "cwidthbudgeted"="0.0625" "depthbudgeted"="0.767" "eweightbudgeted"="1.8" "fpoweravgalloc"="20.0" "kTechMature"="Mature" "COST ELEMENT TYPE"="Host Interface Assembly" "RMA ELEMENT TYPE"="Host Interface Assembly" "\\RMA Host Interface Assembly\\gfaultToler"="No" "\\RMA Host Interface Assembly\\hmtbfbud"="75000.0" "\\RMA Host Interface Assembly\\iLRU"="Yes" "\\RMA Host Interface Assembly\\iMTTRbud"="1.0") MODULE "Component Host Interface Module" MODULE "Component Command Program" ;
COMPONENTS
RDD100 "Component FIR Daughter Card" ("componentType"="HW Element" "cqCompSub"="Board" "crquantity"="1" "cvlengthbudgeted"="0.417" "cwidthbudgeted"="0.0625" "depthbudgeted"="0.3125" "eweightbudgeted"="0.6" "fpoweravgalloc"="5.0" "kTechMature"="Leading Edge" "COST ELEMENT TYPE"="FIR Daughter Card" "RMA ELEMENT TYPE"="FIR Daughter Card" "\\RMA FIR Daughter Card\\gfaultToler"="No" "\\RMA FIR Daughter Card\\hmtbfbud"="30000.0" "\\RMA FIR Daughter Card\\iLRU"="Yes" "\\RMA FIR Daughter Card\\iMTTRbud"="1.0" "Function Name"="Format Report""Function Name"="Convert to Floating Point""Function Name"="Separate Sensor Data""Function Name"="Get Sensor Data""\\Function\\Critical"="Yes");
COMPONENTS
RDD100 "Component PE Motherboard" ("componentType"="HW Element" "cqCompSub"="Board" "crquantity"="1" "cvlengthbudgeted"="0.525" "cwidthbudgeted"="0.0625" "depthbudgeted"="0.767" "eweightbudgeted"="1.0" "fpoweravgalloc"="8.0" "kTechMature"="Mature" "DuplicateComponents"="Fam 1" "Input from"=["Command Program","Processor Element Code Load"] "COST ELEMENT TYPE"="PE Motherboard" "RMA ELEMENT TYPE"="PE Motherboard" "\\RMA PE Motherboard\\gfaultToler"="No" "\\RMA PE Motherboard\\hmtbfbud"="50000.0" "\\RMA PE Motherboard\\iLRU"="Yes" "\\RMA PE Motherboard\\iMTTRbud"="1.0");
COMPONENTS
COMPONENTS
RDD100 "Component Signal Processing Firmware" ("componentType"="FWCI" "cqCompSub"="n/a" "crquantity"="1" "kTechMature"="Leading Edge" "Input from"=["Data I/O Assembly","Separated Sensor Data Link"] "Input from"=["Data I/O Assembly","Report Data Link"] "Output to"=["Data I/O Assembly","Report Data Link 2"] "Output to"=["Command Program","Control Program to SP Link"] "COST ELEMENT TYPE"="Signal Processing Firmware" "RMA ELEMENT TYPE"="Signal Processing Firmware" "Function Name"="Video to Baseband I/Q Conversion""Function Name"="Form Frame""Function Name"="Form Report""Function Name"="Form Processing Array""Function Name"="Range Processing""Function Name"="Azimuth Compression""Function Name"="Convert to Floating Point""\\Function\\Critical"="Yes");
MODULES
RDD100 "Component Interlink Module" ("componentType"="HW Element" "cqCompSub"="Board" "crquantity"="2" "cuRedunMode"="Operational, Off Line replacement" "cvlengthbudgeted"="0.154" "cwidthbudgeted"="0.313" "depthbudgeted"="0.267" "eweightbudgeted"="0.4" "fpoweravgalloc"="3.5" "kTechMature"="Mature" "COST ELEMENT TYPE"="Interlink Module" "RMA ELEMENT TYPE"="Interlink Module" "\\RMA Interlink Module\\gfaultToler"="Yes" "\\RMA Interlink Module\\hmtbfbud"="50000.0" "\\RMA Interlink Module\\iLRU"="Yes" "\\RMA Interlink Module\\iMTTRbud"="1.0");
COMPONENTS
RDD100 "Component Data I/O Module" ("componentType"="HW Element" "cqCompSub"="Board" "crquantity"="1" "cvlengthbudgeted"="0.525" "cwidthbudgeted"="0.0625" "depthbudgeted"="0.767" "eweightbudgeted"="1.8" "fpoweravgalloc"="15.0" "kTechMature"="Leading Edge" "Input from"=["Control Program","Run/Step/Stop"] "Input from"=["Control Program","Separation Control"] "Input from"=["Command Program","Data IO Control"] "Input from"=["Command Program","Hardware Control"] "Output to"=["Command Program","Data I/O Status"] "Output to"=["Command Program","Hot Rod and FIFO Control"] "Output to"=["Command Program","Hardware Status"] "COST ELEMENT TYPE"="Data I/O Module" "RMA ELEMENT TYPE"="Data I/O Module" "\\RMA Data I/O Module\\gfaultToler"="No" "\\RMA Data I/O Module\\hmtbfbud"="30000.0" "\\RMA Data I/O Module\\iLRU"="Yes" "\\RMA Data I/O Module\\iMTTRbud"="1.0" "Function Name"="Output Processed Data""Function Name"="Stop Received""\\Function\\Critical"="Yes");
MODULES
RDD100 "Component Backplane Assembly" ("componentType"="HW Element" "cqCompSub"="Backplane/Cabling" "crquantity"="1" "cvlengthbudgeted"="0.32" "cwidthbudgeted"="1.4" "depthbudgeted"="0.8" "eweightbudgeted"="3.5" "fpoweravgalloc"="3.5" "kTechMature"="Mature" "COST ELEMENT TYPE"="Backplane Assembly" "RMA ELEMENT TYPE"="Backplane Assembly" "\\RMA Backplane Assembly\\gfaultToler"="No" "\\RMA Backplane Assembly\\hmtbfbud"="15000.0" "\\RMA Backplane Assembly\\iLRU"="No") MODULE "Component Interlink Module" MODULE "Component VME Backplane" ;
MODULES

RDD100 "Component Processing Element Assembly" ("componentType"="HW Element" "cqCompSub"="Multiple Board Assembly" "crquantity"="5" "cuRedunMode"="Operational, Off Line replacement" "cvlengthbudgeted"="0.525" "cwidthbudgeted"="0.0625" "depthbudgeted"="0.767" "eweightbudgeted"="1.875" "fpoweravgalloc"="28.0" "kTechMature"="Mature" "COST ELEMENT TYPE"="Processing Element Assembly" "RMA ELEMENT TYPE"="Processing Element Assembly" "\\RMA Processing Element Assembly\\gfaultToler"="Yes" "\\RMA Processing Element Assembly\\hmtbfbud"="16700.0" "\\RMA Processing Element Assembly\\iLRU"="No" "Function Name"="Processor Element Platform Functions""\\Function\\Critical"="Yes") MODULE "Component Signal Processing Firmware" MODULE "Component PE Daughterboard" MODULE "Component PE Motherboard" ;
END_MODULE

Appendix C RDD to PRICE Sample File

The export format for PRICE is in spreadsheet form. Tab delimited between columns and a CR between rows.
For display convenience rows and columns have been reversed. Each column represents a row and vice versa.

4.1.1Rick v33a_A	external tool template	CAfile_demo_16.hpr	Sync_demo_16.hpr	Test_lock	Component Name	Benchmark 1 SAR - Candidate A	Processing Element Assembly	Chassis	Signal Processing Firmware	Control Program
7-Nov-96					componentType	System	HW Element	HW Element	FWCI	FWC
Final: v33a Schema Export beta2					cqCompSub	High Level Assembly	Multiple Board Assembly	Enclosure	n/a	n/a
					cqDesign			COTS	New	New
					cqdPercentNew Design				50	100
					cqDup	No	No	No	No	No
					crquantityTotal					
					crquantity	1	5	1	1	1
					ctquantityRqOper					
					cuRedunMode		"Operational, Off Line replacement"			
					cvlengthbudgeted	1.458	0.525	1.458		
					cvlengthpredicted					
					cwidthbudgeted	0.854	0.0625	0.854		
					cwidthpredicted					
					depthbudgeted	0.875	0.767	0.875		
					depthpredicted					
					eweightbudgeted	60	1.875	24		
					eweightpredicted					
					kTechMature	Leading Edge	Mature	Mature	Leading Edge	Leading Edge
					m1Tech1			None		
					m2Equip1			Structure		
					m3Percent1			100		
					m4Tech2					
					m5Equip2					
					m6Percent2					
					m7Tech3					
					m8Equip3					
					m90Percent3					
					m91Tech4					
					m92Equip4					
					m93Percent4					
					m94Tech5					
					m95Equip5					
					m96Percent5					
					n10SLOC				2400	1400
					n11UtilMem				50	50
					n12UtilProc				50	50
					n13Lang				C	ADA83
					n14NewCode				100	100
					n17Math					
					n18String					
					n19Store					100
					n20Online					
					n21Real				100	
					n22Inter					
					n24User					
					n25UserDD					
					Component		Benchma	Benchma	Processin	Comman

					Name of Next Higher Assembly		rk 1 SAR - Candidate A	rk 1 SAR - Candidate A	g Element Assembly	d Program
					Component Decomposed	Yes	Yes	No	No	No
					Cost Name	Benchmark 1 SAR - Candidate A	Processing Element Assembly	Chassis	Signal Processing Firmware	Control Program
					cPurchased			1200		
					developBud					
					prodbud					
					supbud					
					RMA Name	Benchmark 1 SAR - Candidate A	Processing Element Assembly	Chassis	Signal Processing Firmware	Control Program
					ggavailpred					
					hmtbcfbud					
					hmtbcfpred					
					hmtbfbud	2400	16700	100000		
					hmtbfpred					
					iLRU	No	No	Yes		
					iMainPRICE					
					iMTTRbud			1		
					iMTTRpred					
					k10LRUorgTf					
					k11ModOrgTmo					
					k12LRUILTi					
					k13ModILTmi					
					k14LRUdepotTd					
					k15ModDepotTmd					
					LifeCycleParameter Name	Benchmark 1 SAR				
					aOperEnvir	Military Mobile				
					deploymentQuantity	500				
					eProtoQuantity	1				
					gMissionPeriod	20				
					hDurationLC	20				
					iOnTimeFactor	100				

Appendix D RDD to JRS Sample File

The export format for JRS is in spreadsheet form. Tab delimited between columns and a CR between rows. It is anticipated that only one component at a time will be exported for JRS analysis.

Final: v33a Schema Export beta	
ComponentName	PE Daughterboard
cvlengthbudgeted	0.454
cvlengthpredicted	
cwidthbudgeted	0.0625
cwidthpredicted	
depthbudgeted	0.358
depthpredicted	
depthsensitivity	10
eweightbudgeted	0.4
eweightpredicted	
eweightsensitivity	10
fpoweravgalloc	10.0
fpoweravgpred	
fpowermaxalloc	
fpowermaxpred	
fpowermaxsens	7
developPred	
developBud	
prodpred	
prodbud	
prodsens	
qOperpred	
qOperbud	40
qOpersens	5
suppred	
supbud	45000
supsens	8
hmtbcfbud	
hmtbcfpred	
hmtbfbud	50000.0
hmtbfpred	
InputName	DiscreteItem: 3.C Aux Data
harrivalRateavg	28800.0
harrivalRatepk	336000.0
InputName	DiscreteItem: 3.C Aux Data
harrivalRateavg	28800.0
harrivalRatepk	336000.0
InputName	DiscreteItem: 3.C Aux Data
harrivalRateavg	28800.0
harrivalRatepk	336000.0
InputName	DiscreteItem: 3.4.C Integer I/Q Baseband Data
harrivalRateavg	10000.0
harrivalRatepk	1.0e6