

# Table of Contents

<b>Hardware Limited Warranty .....</b>	<b>xii</b>
<b>Preface .....</b>	<b>xiii</b>
<b>1. Introduction and Specifications .....</b>	<b>1-1</b>
1.1 System Configuration Concepts .....	1-4
1.1.1 IFD IF Digitizer .....	1-9
1.1.2 Digital Receiver PCI Card (RVP8/Rx) .....	1-10
1.1.3 Mother Board or Single-Board Computer (SBC) .....	1-13
1.1.4 Digital Transmitter PCI Card (RVP8/Tx) .....	1-13
1.1.5 I/O-62 PCI Card and I/O Panel .....	1-15
1.2 Comparison of Analog vs Digital Radar Receivers .....	1-17
1.2.1 What is a Digital IF Receiver? .....	1-17
1.2.2 Magnetron Receiver Example .....	1-18
1.2.3 Klystron or TWT Receiver and Transmit RF Example .....	1-20
1.3 RVP8 IF Signal Processing .....	1-21
1.3.1 IFD Data Capture and Timing .....	1-21
1.3.2 Burst Pulse Analysis for Amplitude/Frequency/Phase .....	1-22
1.3.3 Rx Board and CPU IF to I/Q Processing .....	1-23
1.4 RVP8 Weather Signal Processing .....	1-25
1.4.1 General Processing features .....	1-26
1.4.2 RVP8 Pulse Pair Time Domain Processing .....	1-29
1.4.3 RVP8 DFT/FFT Processing .....	1-29
1.4.4 Random Phase Processing for 2nd Trip Echo .....	1-30
1.4.5 Polarization Mode Processing .....	1-30
1.4.6 Output Data .....	1-30
1.5 RVP8 Control and Maintenance Features .....	1-31
1.5.1 Radar Control Functions .....	1-31
1.5.2 Power-Up Setup Configuration .....	1-32
1.5.3 Built-In Diagnostics .....	1-32
1.6 Support Utilities and Available Application Software .....	1-33
1.7 System Network Architecture .....	1-34
1.8 Open Architecture and Published API .....	1-35
1.9 RVP8 Technical Specifications .....	1-36
1.9.1 IFD Digitizer Module, Rev E or later .....	1-36
1.9.2 RVP8/Rx PCI Card, Rev C or later .....	1-37
1.9.3 RVP8/Tx PCI Card .....	1-38
1.9.4 SIGMET I/O-62 PCI Card .....	1-39
1.9.5 I/O-62 Standard Connector Panel .....	1-40

1.9.6	RVP8 Processing Algorithms .....	1-41
1.9.7	RVP8 Input/Output Summary .....	1-43
1.9.8	Physical and Environmental Characteristics .....	1-44
<b>2.</b>	<b>Hardware Installation .....</b>	<b>2-1</b>
2.1	Overview and Input Power Requirements .....	2-1
2.2	IFD IF Digitizer Module Installation .....	2-2
2.2.1	IFD Introduction .....	2-2
2.2.2	IFD Revision History .....	2-3
2.2.3	IFD Power, Size and Mounting Considerations .....	2-4
2.2.4	IFD I/O Summary .....	2-5
2.2.5	IFD Adjustments and Test/Status Indicators .....	2-6
2.2.6	IFD Input A/D Saturation Levels .....	2-8
2.2.7	IF Bandwidth and Dynamic Range .....	2-9
2.2.8	IF Gain and System Performance .....	2-11
2.2.9	IF Gain Based on System Noise Figure .....	2-13
2.2.10	Choice of Intermediate Frequency .....	2-14
2.2.11	IFD Analog AFC Output Voltage (Optional) .....	2-15
2.2.12	IFD Reference Clock Input (Optional) .....	2-15
2.2.13	Communications Between the IFD and RVP8/Rx .....	2-17
2.2.14	Summary of Crystal and Filter Configurations .....	2-18
2.3	RVP8 Chassis .....	2-20
2.3.1	RVP8 Chassis Overview .....	2-20
2.3.2	Power Requirements, Size and Physical Mounting .....	2-20
2.3.3	Main Chassis Direct Connections .....	2-21
2.3.4	External Pre-Trigger Input .....	2-22
2.3.5	Connector Panel I/O Connections .....	2-22
2.3.6	Power-Up Details .....	2-26
2.3.7	Socket Interface .....	2-27
2.4	Digital AFC Module (DAFC) .....	2-30
2.4.1	Example Hookup to a CTI "MVSr-xxx" STALO .....	2-32
2.4.2	Example Hookup to a MITEQ "MFS-xxx" STALO .....	2-34
2.5	RVP8 Custom Interfaces .....	2-35
2.5.1	Using the Legacy IFD Coax "Uplink" .....	2-35
<b>3.</b>	<b>TTY Nonvolatile Setups .....</b>	<b>3-1</b>
3.1	Overview of Setup Procedures .....	3-1
3.1.1	Factory, Saved, and Current Settings .....	3-2
3.1.2	V — View Card and System Status .....	3-3
3.2	View/Modify Dialogs .....	3-6
3.2.1	Mc — Top Level Configuration .....	3-6
3.2.2	Mp — Processing Options .....	3-8
3.2.3	Mf — Clutter Filters .....	3-12

3.2.4	Mt — General Trigger Setups .....	3-14
3.2.5	Mt<n> — Triggers for Pulsetwidth #n .....	3-17
3.2.5.1	Special Options for Tx Synthesis .....	3-21
3.2.6	Mb — Burst Pulse and AFC .....	3-24
3.2.6.1	AFC Motor/Integrator Option .....	3-31
3.2.7	M+ — Debug Options .....	3-32
3.2.8	Mz — Transmissions and Modulations .....	3-34
3.3	Advanced Options .....	3-35
3.3.1	* — Sample current noise levels .....	3-35
3.3.2	@ — Display/Change current Major Mode .....	3-35
3.3.3	~ — Burst-In / IF-In Swap Command (Rev.D IFD) .....	3-35
<b>4.</b>	<b>Plot-Assisted Setups .....</b>	<b>4-1</b>
4.1	P+ — Plot Test Pattern .....	4-2
4.2	General Conventions Within the Plot Commands .....	4-3
4.3	Pb — Plot Burst Pulse Timing .....	4-5
4.3.1	Interpreting the Burst Timing Plot .....	4-5
4.3.2	Available Subcommands Within "Pb" .....	4-6
4.3.3	TTY Information Lines Within "Pb" .....	4-7
4.3.4	Recommended Adjustment Procedures .....	4-8
4.4	Ps — Plot Burst Spectra and AFC .....	4-10
4.4.1	Interpreting the Burst Spectra Plots .....	4-10
4.4.2	Available Subcommands Within "Ps" .....	4-12
4.4.3	TTY Information Lines Within "Ps" .....	4-14
4.4.4	Computation of Filter Loss .....	4-16
4.4.5	Recommended Adjustment Procedures .....	4-19
4.5	Pr — Plot Receiver Waveforms .....	4-22
4.5.1	Interpreting the Receiver Waveform Plots .....	4-22
4.5.2	Available Subcommands Within "Pr" .....	4-24
4.5.3	TTY Information Lines Within "Pr" .....	4-25
4.6	Pa — Plot Tx Waveform Ambiguity .....	4-27
4.6.1	Interpreting the Ambiguity Plots .....	4-27
4.6.2	Available Subcommands Within "Pa" .....	4-29
4.6.3	TTY Information Lines Within "Pa" .....	4-30
4.6.4	Bench Testing of Compressed Waveforms .....	4-32
<b>5.</b>	<b>Processing Algorithms .....</b>	<b>5-1</b>
5.1	IF Signal Processing .....	5-4
5.1.1	FIR (Matched) Filter .....	5-4
5.1.2	RVP8/Rx Receiver Modes .....	5-5
5.1.2.1	Discussion of Halfband Filtering Modes 3-5 .....	5-6
5.1.2.2	Discussion of Wide Dynamic Range Mode-4 .....	5-7
5.1.3	Automatic Frequency Control (AFC) .....	5-9

5.1.4	Burst Pulse Tracking .....	5-9
5.1.5	Interference Filter .....	5-10
5.1.6	Large-Signal Linearization .....	5-13
5.1.7	Correction for Tx Power Fluctuations .....	5-13
5.2	Time Series ("I" and "Q") Signal Processing .....	5-15
5.2.1	Time Series Processing Overview .....	5-15
5.2.2	Frequency Domain Processing- Doppler Power Spectrum .....	5-17
5.2.3	Autocorrelations .....	5-20
5.2.4	Angle Synchronization .....	5-21
5.2.5	Clutter Filtering Approaches .....	5-21
5.2.5.1	Fixed Width Clutter Filters .....	5-23
5.2.5.2	Variable Width Clutter Filter .....	5-24
5.2.5.3	Gaussian Model Adaptive Processing (GMAP) .....	5-25
5.2.6	Range averaging and Clutter Microsuppression .....	5-32
5.2.7	Reflectivity .....	5-32
5.2.8	Velocity .....	5-34
5.2.9	Spectrum Width Algorithms .....	5-34
5.2.10	Signal Quality Index (SQI threshold) .....	5-35
5.2.11	Clutter Correction (CCOR threshold) .....	5-36
5.2.12	Weather Signal Power (SIG threshold) .....	5-37
5.2.13	(Signal+Noise)/Noise Ratio (LOG threshold) .....	5-37
5.3	Thresholding .....	5-38
5.3.1	Threshold Qualifiers .....	5-38
5.3.2	Adjusting Threshold Qualifiers .....	5-39
5.3.3	Speckle Filters .....	5-40
5.4	Reflectivity Calibration .....	5-44
5.4.1	Plot Method for Calibration of $I_o$ .....	5-44
5.4.2	Single-Point Direct Method for Calibration of $I_o$ .....	5-45
5.4.3	Treatment of Losses in the Calibration .....	5-46
5.4.4	Determination of $dBZ_o$ .....	5-47
5.5	Dual PRT Processing Mode .....	5-49
5.5.1	DPRT-1 Mode .....	5-49
5.5.2	DPRT-2 Mode .....	5-50
5.6	Dual PRF Velocity Unfolding .....	5-51
5.7	Random Phase 2nd Trip Processing .....	5-55
5.7.1	Overview .....	5-55
5.7.2	Algorithm .....	5-55
5.7.3	Tuning for Optimal Performance .....	5-56
5.8	Signal Generator Testing of the Algorithms .....	5-60
5.8.1	Linear Ramp of Velocity with Range .....	5-60
5.8.2	Verifying PHIDP and KDP .....	5-61
5.8.3	Verifying RHOH, RHOV, and RHOHV .....	5-61

<b>6. Host Computer Commands</b>	<b>6-1</b>
6.1 No-Operation (NOP)	6-2
6.2 Load Range Mask (LRMSK)	6-2
6.3 Setup Operating Parameters (SOPRM)	6-4
6.4 Interface Input/Output Test (IOTEST)	6-11
6.5 Interface Output Test (OTEST)	6-12
6.6 Sample Noise Level (SNOISE)	6-12
6.7 Initiate Processing (PROC)	6-14
6.8 Load Clutter Filter Flags (LFILT)	6-23
6.9 Get Processor Parameters (GPARM)	6-25
6.10 Load Simulated Time Series Data (LSIMUL)	6-36
6.11 Reset (RESET)	6-38
6.12 Define Trigger Generator Waveforms (TRIGWF)	6-38
6.13 Define Pulse Width Control and PRT Limits (PWINFO)	6-39
6.14 Set Pulse Width and PRF (SETPWF)	6-41
6.15 Load Antenna Synchronization Table (LSYNC)	6-42
6.16 Set/Clear User LED (SLED)	6-44
6.17 TTY Operation (TTYOP)	6-44
6.18 Load Custom Range Normalization (LDRNV)	6-45
6.19 Read Back Internal Tables and Parameters (RBACK)	6-46
6.20 Pass Auxiliary Arguments to Opcodes (XARGS)	6-47
6.21 Load Clutter Filter Specifications (LFSPECS)	6-48
6.22 Configure Ray Header Words (CFGHDR)	6-49
6.23 Configure Interference Filter (CFGINTF)	6-50
6.24 Set AFC level (SETAFC)	6-51
6.25 Set Trigger Timing Slew (SETSLEW)	6-51
6.26 Hunt for Burst Pulse (BPHUNT)	6-52
6.27 Configure Phase Modulation (CFGPHZ)	6-52
6.28 Set User IQ Bits (UIQBITS)	6-53
6.29 Set Individual Thresholds (THRESH)	6-53
6.30 Set Task Identification Information (TASKID)	6-55
6.31 Define PRF "Pie Slices" (PRFSECT)	6-55
6.32 Configure Target Simulator (TARGSIM)	6-57
6.33 Set Burst Pulse Processing Options (BPOPTS)	6-58
6.34 Custom User Opcode (USRINTR and USRCONT)	6-58
<b>A. Serial Status Formats</b>	<b>A-1</b>
<b>B. Optional Dual Polarization- ZDR, PHIDP, KDP, LDR, ...</b>	<b>B-1</b>
B.1 Overview of Dual Polarization	B-1
B.2 Radar System Considerations	B-3
B.3 RVP8 Dual-Channel Receiver Approach	B-5

B.4	Overview of Processing Algorithms .....	B-6
B.5	Case 1: Fixed Transmit: Dual-Channel Receiver .....	B-9
B.6	Case 2: Simultaneous Dual Transmit and Receive (STAR) .....	B-10
B.7	Case 3: Alternating H/V Transmit: Single Receiver .....	B-11
B.8	Case 4: Alternating H/V Transmit: Dual Receiver .....	B-12
B.9	KDP Calculation .....	B-13
B.10	Standard Moment Calculations (T, Z, V, W) .....	B-14
B.11	Thresholding of Polarization Parameters .....	B-24
B.12	Calibration Considerations .....	B-25
<b>C.</b>	<b>RVP8/RCP8 Packaging .....</b>	<b>C-1</b>
C.1	Main Chassis General Description .....	C-2
C.1.1	Main Chassis Front Panel .....	C-7
C.1.2	Main Chassis Back Panel .....	C-8
C.1.3	Main Chassis Back Panel Power Section .....	C-9
C.1.4	Main Chassis Back Panel PC I/O Section .....	C-10
C.1.5	Main Chassis Back Panel PCI Card Section .....	C-11
C.2	I/O-62 and Connector Panel .....	C-14
C.3	IFD Module (RVP8 Only) .....	C-30
C.4	DAFC Module (RVP8 only) .....	C-33
<b>D.</b>	<b>Installation and Test Procedure .....</b>	<b>D-1</b>
D.1	Installation Check .....	D-3
D.2	Power-Up Check .....	D-4
D.3	Setup Terminal .....	D-5
D.4	Setup "V" Command (Internal Status) .....	D-6
D.5	Setup "Mc" Command (Board Configuration) .....	D-7
D.6	Setup "Mp" Command (Processing Options) .....	D-8
D.7	Setup "Mf" Command (Clutter Filters) .....	D-9
D.8	Setup "Mt" Command (General Trigger Setup) .....	D-10
D.9	Initial Setup of Information for Each Pulse Width .....	D-11
D.10	Setup "Mb" Command (Burst Pulse and AFC) .....	D-12
D.11	Setup "M+" Command (Debug Options) .....	D-13
D.12	Setup "Mz" Command (Transmitter Phase Control) .....	D-14
D.13	A-Scope Test .....	D-15
D.14	Burst Pulse Alignment .....	D-16
D.15	Bandwidth Filter Adjustment .....	D-17
D.16	Digital AFC (DAFC) Alignment (Optional) .....	D-18
D.17	Analog AFC Voltage Alignment (Optional) .....	D-19
D.18	MFC Functional Test and Tuning (Optional) .....	D-21
D.19	AFC Functional Test (Optional) .....	D-22
D.20	Input IF Signal Level Check .....	D-23
D.21	Dynamic Range Check .....	D-24

D.22 Receiver Bandwidth Check .....	D-26
D.23 Receiver Phase Noise Check .....	D-28
D.24 Hardcopy and Backup of Final Setups .....	D-29
D.25 IFD Stand-alone SigGen Bench Test .....	D-30
D.26 RVP8/Tx Stand-alone Bench Test .....	D-31
D.27 RVP8/Rx Stand-alone Bench Test .....	D-32
<b>E. RVP8 Developer's Notes (draft) .....</b>	<b>E-1</b>
E.1 Organization of the RDA Software .....	E-1
E.2 RVP8 Overall Code Organization .....	E-2
E.2.1 RVP8 Software Maintenance Model .....	E-4
E.2.2 Installing Incremental RDA Upgrades .....	E-4
E.2.3 Rebuilding the RDA Linux Kernel Module .....	E-5
E.3 Debugging and Profiling Your Code .....	E-6
E.3.1 Monitoring Opcode/Data Activity: -exposeIO .....	E-6
E.3.2 Showing Live Acquired Pulse Info: -showAQ .....	E-7
E.3.3 Showing Coherent Processing Intervals: -showCPIs .....	E-8
E.3.4 Showing RealTime Callback Timers: -showRTCtl .....	E-8
E.3.5 Using ddd on the Main & Proc Code .....	E-9
E.3.6 Finding memory leaks with valgrind .....	E-10
E.3.7 Profiling with gprof .....	E-10
E.4 Creating New Major Modes from Old Ones .....	E-11
E.4.1 Function Pointers are the Key to Customization .....	E-11
E.5 Real-Time Control of the RVP8 .....	E-13
E.5.1 Using the Programmable Callback Timers .....	E-13
E.5.2 Example: Standard Trigger/Antenna Events .....	E-13
E.5.3 Example: RealTime Interrupt Histogram .....	E-14
E.6 Customizing the (I,Q) Data Stream .....	E-15
E.6.1 Defining the FIR Matched Filter .....	E-15
E.6.2 Applying Raw Pulse Corrections .....	E-15
E.6.3 Inserting UserIQ Header Bits .....	E-15
E.7 Customizing the Front Panel Display .....	E-15
E.8 Adding Custom DSP/Lib Opcodes .....	E-15
E.9 Using the Softplane for Physical I/O .....	E-15
E.9.1 Softplane Programmer's Model .....	E-15
E.9.2 Reducing Unnecessary PCI Traffic .....	E-16
E.10 Handling Live Antenna Angles .....	E-16
E.11 Creating Custom Trigger Sequences .....	E-16
E.11.1 Defining Trigger Waveshapes .....	E-16
E.11.2 Defining Trigger PRT Sequences .....	E-16
E.11.3 Polarization and Phase Control .....	E-16
E.11.4 Example: Adding PRT Micro-Stagger .....	E-16

E.12	Determining CPI's and Ray Boundaries .....	E-17
E.13	Using the RVP8 TimeSeries API .....	E-17
E.13.1	Reader and Writer Clients .....	E-17
E.13.2	Attach/Detach Details .....	E-18
E.13.3	Extracting Pulses via Sequence Numbers .....	E-18
E.13.4	Using Memory Bandwidth Effectively .....	E-18
E.13.5	Packed and Floating Data Formats .....	E-18
E.14	Using the Intel IPP Library .....	E-18
<b>F.</b>	<b>Time Series Recording .....</b>	<b>F-1</b>
F.1	Overview .....	F-1
F.2	TS Record/Playback Software Architecture .....	F-2
F.2.1	General Architecture .....	F-2
F.2.2	Description of Processes .....	F-2
F.3	Installation & Configuration .....	F-4
F.3.1	Required Software .....	F-4
F.3.2	Configuring UDP Ports .....	F-4
F.3.3	Configuring automatic start-up of tsimport & tsexport .....	F-4
F.3.4	Configuring Network buffering for tsimport .....	F-5
F.3.5	Tsimport and Tsexport from the command line .....	F-5
F.4	Tsswitch Utility .....	F-6
F.5	Tsarchive Utility .....	F-7
F.5.1	Archive Directory Area .....	F-7
F.5.2	TS Source .....	F-8
F.5.3	Filter .....	F-9
F.5.4	TS Archive Log Area .....	F-10
F.6	Specific Software Application Examples .....	F-12
F.6.1	Case 1: TS recording on a local RVP8 .....	F-13
F.6.2	Case 2: TS recording on separate archive host .....	F-14
F.6.3	Case 3: TS playback on a local RVP8 .....	F-15
F.6.4	Case 4: TS playback from a separate archive host to an RVP8 .....	F-16
F.6.5	Quick Guides .....	F-17
F.7	Ascope Playback Features .....	F-18
F.8	TS Playback using IRIS .....	F-20
F.9	TS Viewing Utility (tsview) .....	F-21
F.9.1	Overview .....	F-21
F.9.2	Starting tsview and Sample Session .....	F-21
F.9.3	Tsview Command Line Options .....	F-22
F.10	TS Record Data Format .....	F-25
<b>G.</b>	<b>References and Credits .....</b>	<b>G-1</b>
<b>Index</b>	<b>.....</b>	<b>Index-1</b>



## Figures

Figure 1-1:	Analog vs Digital Receiver for Magnetron Systems .....	1-19
Figure 1-2:	Analog vs Digital Receiver for Klystron Systems .....	1-20
Figure 1-3:	IF to I/Q Processing Steps .....	1-23
Figure 1-4:	I/Q Processing for Weather Moment Extraction .....	1-26
Figure 1-5:	Network Architecture for Socket Interface with DspExport .....	1-34
Figure 2-1:	Calibration Plot for a Stand-alone 14-Bit IFD .....	2-10
Figure 2-2:	Tradeoff Between Dynamic Range and Sensitivity .....	2-11
Figure 2-3:	Assembly Diagram of the DAFC .....	2-30
Figure 2-4:	Recommended Receiving Circuit for the Coax Uplink .....	2-35
Figure 2-5:	Timing Diagram of the IFD Coax Uplink .....	2-36
Figure 4-1:	The Test Pattern Display .....	4-2
Figure 4-2:	Successful Capture of the Transmit Burst .....	4-5
Figure 4-3:	Example of a Filter With Excellent DC Rejection .....	4-10
Figure 4-4:	Example of a Poorly Matched Filter .....	4-19
Figure 4-5:	Example of a Filter With Poor DC Rejection .....	4-21
Figure 4-6:	Example of Combined IF Sample and LOG Plot .....	4-22
Figure 4-7:	Example of a Noisy High Resolution "Pr" Spectrum .....	4-24
Figure 4-8:	Ambiguity Diagram of a Compressed Tx Pulse .....	4-27
Figure 4-9:	Frequency, Phase and Amplitude of a Compressed Tx Pulse .....	4-28
Figure 4-10:	IFD Sampling of Optimized Compressed Tx Waveform .....	4-32
Figure 4-11:	Ideal and Actual Linear-FM Spectrum Displayed in Ps Plot .....	4-33
Figure 5-1:	Flow Diagram of RVP8 Processing .....	5-3
Figure 5-2:	Linearization of Saturated Signals Above +4.5dBm (Rev B/C IFD) .	5-13
Figure 5-3:	Example of time series and Doppler power spectrum .....	5-16
Figure 5-4:	Typical form of a time series window .....	5-18
Figure 5-5:	Impulse response of a typical window .....	5-19
Figure 5-6:	Example of fixed width .....	5-23
Figure 5-7:	Variable Width Clutter Filter .....	5-24
Figure 5-8:	GMAP Algorithm Steps .....	5-26
Figure 5-9:	GMAP example .....	5-31
Figure 5-10:	Model Intensity Curve .....	5-44
Figure 5-11:	Illustration of Losses that Affect LOG Calibration .....	5-47
Figure 5-12:	Dual PRF Concepts .....	5-52
Figure 5-13:	Example of Dual PRF Trigger Waveforms .....	5-54
Figure 5-14:	Random Phase Processing Algorithm .....	5-59
Figure B-1:	Least Squares KDP calculation .....	B-13
Figure C-1:	Main Chassis- Front Panel .....	C-3
Figure C-2:	Main Chassis- Back Panel .....	C-4
Figure C-3:	Main Chassis- Right Side View .....	C-5
Figure C-4:	Main Chassis Internal Cabling .....	C-6

Figure C-5:	RVP8 I/O-62 Connector Panel .....	C-16
Figure C-6:	RCP8 I/O-62 Connector Panel .....	C-17
Figure C-7:	RVP8/IFD Module .....	C-31
Figure C-8:	IFD Front Panel .....	C-32
Figure C-9:	View of DAFC Module .....	C-33
Figure E-1:	RVP8 Hardware and Software Organization .....	E-3

## Tables

Table 1-1:	Examples of Dual PRF Velocity Unfolding .....	1-28
Table 2-1:	Differences Among Versions of the IFD .....	2-3
Table 2-2:	IFD Connectors (All Revisions) .....	2-5
Table 2-3:	IFD Connectors (Rev.A-Rev.D) .....	2-5
Table 2-4:	IFD Connectors (Rev.E & Greater) .....	2-5
Table 2-5:	IFD Toggle Switch Settings .....	2-6
Table 2-6:	IFD LED Indicator Interpretations .....	2-6
Table 2-7:	IFD Internal Jumper Settings .....	2-7
Table 2-8:	Clock Locking Component Options .....	2-19
Table 2-9:	Direct Connections to RVP8 Main Chassis .....	2-21
Table 2-10:	DAFC Protocol Jumper Selections .....	2-31
Table 2-11:	Pinout for the CTI "MVSr-xxx" STALO .....	2-33
Table 2-12:	Bit Assignments for the IFD Coax Uplink .....	2-36
Table 5-1:	Algebraic Quantities Within the RVP8 Processor .....	5-2
Table 5-2:	Algorithm Results for +16dB Interference .....	5-11
Table 5-3:	Algorithm Results for +26dB Interference .....	5-12
Table 6-2:	RVP8 Status Output Words .....	6-26
Table A-1:	Internal BITE Packet (RVP8 to Host) .....	A-1
Table A-2:	Internal QBITE Packet (RVP8 to Host) .....	A-5
Table B-1:	Transmitter Types .....	B-3
Table B-2:	Supported Polarization Modes and Outputs .....	B-6
Table C-1:	RVP8 and RCP8 I/O-62 Card Jumper Settings .....	C-12
Table C-2:	RVP8/Rx Card Jumper Settings .....	C-13
Table C-3:	RVP8/Tx Card Jumper Settings .....	C-13
Table C-4:	J1 "AZ INPUT" .....	C-18
Table C-5:	J2 "AZ OUTPUT" .....	C-19
Table C-6:	J3 RVP8: "PHASE OUT"; RCP8 "CONTROL" .....	C-20
Table C-7:	J4 "EL INPUT" .....	C-21
Table C-8:	J5 "EL OUTPUT" .....	C-22
Table C-9:	J6 "RELAY" .....	C-23
Table C-10:	J7: RVP8 "SPARE"; RCP8 "BITE 19:0" .....	C-24
Table C-11:	J8: RVP8 "SPARE"; RCP8 "ANALOG IN" .....	C-25
Table C-12:	J9 RVP8: "MISC I/O" ; RCP8: "PED/STATUS" .....	C-26
Table C-13:	J10 "SERIAL" .....	C-27
Table C-14:	J11 "SERIAL" .....	C-27
Table C-15:	J12 "S-D" .....	C-28
Table C-16:	RVP8 BNC Connector Pin Assignments .....	C-29
Table C-17:	RCP8 BNC Connector Pin Assignments .....	C-29
Table F-1:	TS File Format .....	F-25