

# Table of Contents

<b>Preface .....</b>	<b>vii</b>
<b>1. Introduction and Specifications .....</b>	<b>1-1</b>
1.1 General Architecture .....	1-2
1.1.1 Mother Board or Single-Board Computer (SBC) .....	1-3
1.1.2 I/O-62 PCI Card and I/O Connector Panel .....	1-4
1.2 System Network Architecture Options .....	1-6
1.2.1 Case 1: Standard Serial Line Interface .....	1-7
1.2.2 Case 2: Combined RCP8/RCW .....	1-8
1.2.3 Case 3: Socket Interface Using AntExport .....	1-9
1.3 RCP8 Specifications .....	1-10
1.3.1 Antenna Control I/O and Features .....	1-10
1.3.2 Fail-safe Antenna Protection Features .....	1-10
1.3.3 Optional Shipboard Stabilization .....	1-11
1.3.4 Radar Status/Control I/O and Features .....	1-11
1.3.5 Application Software for Test/Monitoring .....	1-12
1.3.6 SIGMET I/O-62 PCI Card .....	1-13
1.3.7 RCP8 Standard Connector Panel .....	1-14
1.3.8 Physical and Environmental Characteristics .....	1-16
<b>2. Hardware Installation .....</b>	<b>2-1</b>
2.1 Overview and Input Power Requirements .....	2-1
2.2 Initial Power-Up Prior to Connecting to Radar .....	2-3
2.3 RCP8 Chassis .....	2-4
2.3.1 RCP8 Chassis Overview .....	2-4
2.3.2 Power Requirements, Size and Physical Mounting .....	2-4
2.3.3 Main Chassis Direct Connections .....	2-5
2.4 RCP8 Connector Panel .....	2-6
2.5 Host Computer Serial Interface .....	2-10
2.6 Socket Interface .....	2-11
<b>3. TTY Menu Control and Monitoring .....</b>	<b>3-1</b>
3.1 Starting the TTY Menus .....	3-2
3.2 The TTY Main Menu .....	3-3
3.3 The TTY Help Menu .....	3-4
3.3.1 TTY "Help Support" Command .....	3-4
3.3.2 TTY "Help View" Command .....	3-4
3.4 The TTY "MONITOR" Command .....	3-5
3.4.1 TTY Antenna Monitor and Control .....	3-5
3.4.1.1 Commands Recognized by the Angle Monitor .....	3-7

3.4.1.2	Alternate Display for Shipboard Platforms .....	3-7
3.4.1.3	Alternate Display of Antenna Dynamics .....	3-8
3.4.2	TTY Serial I/O Monitor .....	3-9
3.4.2.1	Commands Recognized by the Serial I/O Monitor .....	3-10
3.4.2.2	Alternate Displays of Raw SIO Records .....	3-10
3.4.3	TTY Inertial Navigation Unit Monitor .....	3-11
3.4.3.1	Alternate INU Monitor Presentations .....	3-11
3.4.4	TTY Status Line Monitor .....	3-12
3.4.5	TTY Control Request Monitor .....	3-12
3.4.6	TTY Internal LOG Monitor .....	3-13
3.4.7	TTY Analog Voltage Input Monitor .....	3-14
3.5	TTY "RESET" Command .....	3-14
<b>4.</b>	<b>TTY Setup Menus .....</b>	<b>4-1</b>
4.1	Using the SETUP Menus .....	4-2
4.2	Summary of Setup TTY Configuration Parameters .....	4-3
4.3	The "SAVE" and "RESTORE" Commands .....	4-9
4.4	The "SITE" Command .....	4-9
4.4.1	Front Panel Display Setups .....	4-9
4.4.2	Host Computer I/O Setups .....	4-11
4.4.3	Customer-Specific Site Setups .....	4-13
4.4.4	Data and Event Logging .....	4-17
4.4.5	Miscellaneous Site Setups .....	4-18
4.5	The "AXIS" Command .....	4-18
4.6	The "VSERVO" Command .....	4-26
4.7	The "PSERVO" Command .....	4-30
4.8	The "CONTROL" Command .....	4-32
4.8.1	Output Line Configuration .....	4-32
4.8.2	Logic Equation Control Qualifiers .....	4-32
4.8.3	Logic Equation Timer Variables .....	4-37
4.8.4	Logic Equation Examples .....	4-40
4.8.5	Logic Equation Configuration of Variables .....	4-42
4.8.6	Analog Voltage Input Control Logic Variables .....	4-43
4.9	The "STATUS" Command .....	4-44
4.10	The "INU" Command .....	4-44
<b>5.</b>	<b>Theory of Servo Operation .....</b>	<b>5-1</b>
5.1	Overview of Servo Concepts .....	5-1
5.2	Velocity Servo Theory .....	5-2
5.2.1	Tachometer Input .....	5-3
5.2.2	Nominal Drive Slope .....	5-3
5.2.3	Velocity Feedback Slope and Dead Zone .....	5-3
5.2.4	Drive and Tach Sign Correction .....	5-4

5.3	Position Servo Theory .....	5-4
5.3.1	The Position Servo Response Curve .....	5-5
5.4	Fail-safe Antenna Features .....	5-6
5.5	Modification of Servos For Use on a Moving Platform .....	5-11
<b>A.</b>	<b>Serial Control Formats .....</b>	<b>A-1</b>
<b>B.</b>	<b>Antenna Stabilization Procedure .....</b>	<b>B-1</b>
<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>Index</b>	<b>.....</b>	<b>Index-1</b>

## Figures

Figure 1-1:	RCP8 Architecture .....	1-2
Figure 1-2:	Front Panel Display .....	1-3
Figure 1-3:	Network Architecture- Case 1: Standard Serial Interface .....	1-7
Figure 1-4:	Network Architecture- Case 2: Combined RCP8/RCW .....	1-8
Figure 1-5:	Network Architecture- Case 3: Socket with AntExport .....	1-9
Figure 1-6:	Antenna and Bitex utility examples .....	1-12
Figure 4-1:	Digital Velocity Servo .....	5-2
Figure 4-2:	Digital Position Servo .....	5-5
Figure 4-3:	Example of the Lower EL LIMITS. ....	5-8
Figure 4-4:	Modification of Velocity Servos .....	5-12
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

## Tables

Table 2-1:	Direct Connections to RCP8 Main Chassis .....	2-5
Table A-1:	Status Packet RCV01 Format (RCP8 to Host) .....	A-3
Table A-2:	Control Packet XMT01 Format (Host to RCP8) .....	A-4
Table A-3:	Status Packet RCV02 / RCV04 Format (RCP8 to Host) .....	A-5
Table A-4:	Control Packet XMT02 / XMT04 Format (Host to RCP8) .....	A-6
Table A-5:	Status Packet RCV03 Format (RCP8 to Host) .....	A-7
Table A-6:	Status Packet RCV05 Format (RCP8 to Host) .....	A-9
Table A-7:	Control Packet XMT05 Format (Host to RCP8) .....	A-10
Table A-8:	Time Packet (RCP8 to Host) .....	A-11
Table A-9:	Generic BITE Packet (RCP8 To/From Host) .....	A-11
Table A-10:	Q-BITE Status Packet (Both ways) .....	A-11
Table A-11:	Internal BITE Packet (RCP8 to Host) .....	A-13
Table A-12:	Auxiliary Status/Control BITE Packets .....	A-15
Table A-13:	WSR-88D DCU BITE Packet (RCP8 to Host) .....	A-16
Table A-14:	WSR-88D DCU Self-Test1 BITE Packet (RCP8 to Host) .....	A-18
Table A-15:	WSR-88D DCU Self-Test2 BITE Packet (RCP8 to Host) .....	A-19
Table A-16:	WSR-88D DAU BITE Packet (RCP8 to Host) .....	A-20
Table A-17:	WSR-88D DAU Q-BITE Packet (RCP8 to Host) .....	A-24
Table A-18:	BITE Interrogate Packet (Host to RCP8) .....	A-25

Table A-19: Q-BITE Interrogate Packet (Host to RCP8) .....	A-25
Table A-20: BITE Individual Request Packet (Host to RCP8) .....	A-25
Table A-21: Chat-Mode Packet .....	A-26
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