

Table of Contents

Preface	ix
1. Introduction to IRIS Products	1-1
1.1 IRIS Product Overview	1-2
2. Configuring IRIS Products	2-1
2.1 Product Configuration Menu	2-3
2.1.1 Task Summary	2-4
2.1.2 Map Projections	2-6
2.1.3 Product Parameters	2-10
2.1.4 Display Parameters	2-12
2.2 BASE: Echo Base Product	2-17
2.3 BEAM: Antenna Beam Pattern Product	2-19
2.4 CAPPI: Constant Altitude Plan Position Indicator	2-22
2.5 FCAST: Forecast	2-24
2.6 HMAX: Height of Maximum Intensity Product	2-27
2.7 MAX: Maximum Reflectivity	2-29
2.8 PPI: Plan Position Indicator	2-34
2.9 RAIN1: Hourly Rain Accumulation	2-36
2.9.1 Scheduling RAIN1 Products	2-38
2.10 RAINN: N-Hour Rain Accumulation	2-39
2.10.1 Scheduling RAINN Products	2-40
2.11 RAW: Raw Data	2-42
2.11.1 Recording RAW Data Automatically	2-43
2.12 RHI: Range Height Indicator	2-44
2.13 RTI: Range Time Indicator	2-48
2.14 SRI: Surface Rainfall Intensity	2-52
2.14.1 Input reflectivity profiles	2-54
2.14.2 Product Configuration	2-57
2.14.3 Correction example	2-59
2.15 STAT: IRIS System Status	2-62
2.16 TOPS: Echo Tops	2-63
2.17 TRACK: Track/Forecast	2-65
2.18 VIL: Vertically Integrated Liquid	2-69
2.19 VVP: Velocity Volume Processing	2-71
2.19.1 Configuring the Associated TASK	2-73
2.19.2 Producing VVP Product Output	2-73
2.20 WARN: Warning/Centroid Product	2-75
2.20.1 WARN Product Configuration Menu	2-79
2.20.2 Using the WARN Product	2-82

2.21 WIND: Wind Speed and Direction	2-83
2.22 XSECT: Cross Section	2-85
3. Optional IRIS Products	3-1
3.1 CATCH: Subcatchments Precipitation Accumulation	3-2
3.1.1 Overview	3-2
3.1.2 CATCH Product Configuration	3-3
3.1.3 Subcatchment Definition	3-5
3.1.4 Scheduling CATCH Products	3-5
3.1.5 CATCH Product Algorithm	3-6
3.1.6 Product Display	3-7
3.2 COMP: Composite	3-9
3.2.1 Overview	3-9
3.2.2 Composite Algorithm	3-12
3.2.3 COMP Configuration Menu	3-13
3.2.4 WARN Algorithm	3-16
3.2.5 COMP Scheduling	3-17
3.3 DWELL Algorithm: Composite in Time	3-19
3.3.1 Overview	3-19
3.3.2 Dwell Algorithm Examples	3-21
3.3.3 DWELL Algorithm and Scheduling	3-24
3.3.4 Basic DWELL Algorithm Configuration	3-28
3.3.5 Target Detection: Input TASK and Product Optimization	3-32
3.3.6 Target Detection: Algorithm and Configuration	3-34
3.3.7 Target Detection: Migratory Bird Examples	3-38
3.4 NDOP: Multiple Doppler	3-46
3.4.1 Input velocity corrections	3-47
3.4.2 Product Configuration	3-49
3.4.3 Display and Algorithm Notes	3-52
3.5 SHEAR: Wind Shear	3-55
3.5.1 The SHEAR Algorithm	3-59
3.5.2 Optimizing for Microburst Detection	3-61
3.6 SLINE: Shear Line (Optional)	3-66
3.6.1 Shear Line Radar Signatures	3-70
3.6.2 The Shear Line Algorithm	3-70
4. Scheduling Products	4-1
4.1 Product Scheduler Menu	4-2
4.2 Adding, Removing, and Editing Products in the Schedule	4-6
4.3 Scheduling and Stopping Product Generation	4-7
4.4 Some Hints on Running Products	4-9
5. The Quick Look Window	5-1
5.1 Setting-Up and Starting the Quick Look Windows	5-2

5.2	General Window Layout	5-3
5.3	General Window Control/Monitoring	5-5
5.4	Selecting Products for Display	5-8
5.5	Live Action Tool- Product Generation and Display	5-10
5.6	Changing the Size of the Window and Zoom Level	5-11
5.7	Color Scale Tool	5-12
5.8	Display Options Tool	5-14
5.9	Animation or Loop Tool	5-22
5.10	Slide Show Tool	5-28
5.11	Cursor Tool	5-31
5.12	Track/Annotate Tool	5-34
5.13	Forecast Tool	5-41
5.14	Cross-Section (XSECT) Tool	5-43
5.15	Product Output Options Tool	5-48
5.15.1	VVP Output Options: Time-Height	5-49
5.15.2	VVP Output Options: Line Graphs	5-52
5.15.3	WIND and FCAST Output Options	5-54
5.15.4	CAPPI Height Selection Tool	5-55
5.15.5	NDOP Output Options	5-56
5.15.6	WARN Output Options	5-57
5.16	Printing and Exporting Displays	5-58
5.17	Window Keyboard Commands	5-59
6.	Requesting Product Output	6-1
6.1	Product Output Devices and Files	6-2
6.2	Product Output Menu	6-3
6.2.1	Filter Section	6-4
6.2.2	Product List	6-7
6.3	Sending a Product to a Device	6-10
6.4	Flagging a Product	6-12
7.	Performing Archive Operations	7-1
7.1	Archive Menu	7-2
7.1.1	Archive Control Area	7-3
7.1.2	Archive Log Area	7-5
7.2	Initializing a Tape or Disk for Recording	7-7
7.3	Mounting a Tape or Disk	7-9
7.4	Recording Data	7-10
7.5	Creating and Printing a Log	7-12
7.6	Retrieving Product Files from Archive	7-13
7.7	Stopping an Archive Operation	7-15
7.8	Unmounting a Tape or Disk	7-15
8.	Managing Ingest Files	8-1
8.1	Ingest Summary Menu	8-2

8.1.1 Filter Menu	8-2
8.1.2 Ingest File List	8-4
8.2 Tagging and Untagging Files	8-6
9. Choosing Overlay Files	9-1
9.1 Overlay Menu	9-2
9.2 Assigning an Overlay to a Radar Site	9-3
A. Basic Radar Meteorology	A-1
A.1 Introduction	A-1
A.2 Reflectivity	A-2
A.3 Geometry	A-4
A.4 Problems in interpretation of radar images	A-4
A.5 Doppler wind measurements	A-5
A.6 Clutter cancellation	A-6
B. Product Configuration Example	B-1
B.1 Summary of Configuration Examples	B-2
B.2 Setting Up the Weather MONITOR Mode	B-4
B.3 Setting Up the Terminal Doppler Modes	B-21
C. Radial Velocity Correction	C-1
C.1 Ship Motion Parameters and Coordinate Transformations	C-2
C.2 Radial Velocity Correction	C-3
C.3 Configuration	C-6
C.4 Testing	C-7
C.4.1 The Antenna Utility	C-7
C.4.2 The Rays Utility	C-7
C.5 In Situ Testing Suggestions	C-8
C.5.1 Dynamic Adjustment of Moment Arms	C-8
C.6 Summary of Velocity Correction Algorithm: INU Example	C-9
D. IRIS 3D	D-1
D.1 Introduction	D-1
D.2 Using the IRIS/3D Software	D-3
D.3 Installation and Configuration	D-11
E. IRIS TDWR Features	E-1
E.1 Overview	E-1
E.1.1 Items provided with the IRIS/TDWR Option	E-1
E.1.2 IRIS/TDWR Terminology	E-2
E.1.3 IRIS/TDWR Hardware Configuration Example	E-3
E.1.4 Data Flow for Ribbon Display Generation	E-4
E.1.5 IRIS/TDWR Configuration Summary	E-5

E.2	IRIS Preparation	E-6
E.2.1	Protected Area Configuration (Arenas)	E-6
E.2.2	IRIS TASK and Product Configuration	E-8
E.2.3	IRIS Product Output Configuration	E-9
E.3	Ribbon Displays	E-11
E.3.1	What is a Ribbon Display?	E-11
E.3.2	Types of Ribbon Displays Supported by IRIS	E-11
E.3.3	Dale Ribbon Display Hardware Installation	E-12
E.3.4	Dale Ribbon Display General Use	E-13
E.3.5	IRIS Virtual Ribbon Display	E-15
E.3.6	Ribbon Display Software Configuration	E-16
E.3.7	Ribbon Display Testing with tdwr_sim	E-21
E.3.8	Summary of Ribbon Display Alert Messages	E-22
E.4	TDWR/LLWAS Integrator and Runways Utility	E-23
E.4.1	What is the “Integrator”	E-23
E.4.2	Configuring the Integrator and Runways Utility- runways.conf	E-25
E.4.3	Starting the Integrator	E-29
E.4.4	Runways Utility	E-30
F.	Hydromet Raingage Correction	F-1
F.1	Overview	F-1
F.2	Hydromet Data Flow for Raingage Correction	F-2
F.3	Gage Data File Format	F-4
F.4	Configuration of RAIN1 with Raingage Correction	F-6
F.5	Algorithm for RAIN1 Gage Calibration	F-11
F.6	RAIN1 Scheduling with Gage Product	F-12
F.7	References	F-13
Index	Index-1

Figures

Figure 2–1: Example of 15-tilt Volume Scan	2–5
Figure 2–2: Color Legend Format Example	2–15
Figure 2–3: Example of MAX Display	2–30
Figure 2–4: Example of MAX Geometry	2–31
Figure 2–5: Example reflectivity profile	2–52
Figure 2–6: Example of VVP Reflectivity profile	2–55
Figure 2–7: Example Profile Correction vs. Range	2–61
Figure 2–8: Track with Two Centroids	2–66
Figure 2–9: Example of Radial Velocity vs. Azimuth Display	2–72
Figure 2–10: HAIL Warning/Centroid	2–76
Figure 2–11: Example of Warning Situation Display	2–77
Figure 2–12: Cross Section Geometry	2–86
Figure 3–1: PPI of dBZ at a Single Time	3–21
Figure 3–2: Dwell of PPI for the Previous 2 Hours Showing dBZ	3–22
Figure 3–3: Dwell of PPI for the Previous 2 Hours Showing Time (Age)	3–23
Figure 3–4: background field for 2-Hour Dwell Showing dBZ	3–26
Figure 3–5: Schematic Examples of Wind Shear	3–57
Figure 3–6: Radial Shear Algorithm Schematic	3–59
Figure 3–7: B-Scan Space (PPI surface)	3–61
Figure 3–8: Mean Velocity Shear Correction	3–62
Figure 3–9: TASK Configuration for Microburst Detection	3–64
Figure 3–10: Typical Shear Line Features	3–67
Figure 4–1: Illustration of Next-Data-Time, ALL and NEXT	4–7
Figure 4–2: Illustration of Skip Time with and All Request	4–8
Figure 9–1: Overlay Menu with Pop-Up Menu	9–3
Figure A–1: Range Bin Geometry	A–2
Figure A–2: dBZ Values for Various Phenomena	A–3
Figure A–3: Beam Height vs. Range	A–4
Figure A–4: Typical Spectrum Plot	A–7
Figure B–1: Z_120 CAPPI Product Configuration	B–4
Figure B–2: GROUND CAPPI Product Configuration	B–5
Figure B–3: MAX150 MAX Product Configuration	B–6
Figure B–4: Z_005_300 PPI Product Configuration	B–7
Figure B–5: HOURLY RAIN1 Product Configuration	B–8
Figure B–6: 06_HOURS RAINN Product Configuration	B–9
Figure B–7: STAR_RHI RHI Product Configuration	B–10
Figure B–8: RAIN TOPS Product Configuration	B–11
Figure B–9: CLOUD TOP Product Configuration	B–12
Figure B–10: VIL240 VIL Product Configuration	B–13
Figure B–11: VVP Product Configuration	B–14

Figure B-12: RWY_45 XSECT Product Configuration	B-15
Figure B-13: SEVERE WARN Product Configuration	B-16
Figure B-14: MONITOR Mode Product Schedule	B-17
Figure B-15: MONITOR Mode Radar Status Menu	B-18
Figure B-16: TD_RWY_09 and TD_RWY_27 Protected Areas	B-22
Figure B-17: TDWR TASK Configuration	B-23
Figure B-18: TDWR Task Schedule	B-24
Figure B-19: Z_010_30 PPI Product Configuration	B-25
Figure B-20: TD_009_30 SHEAR Product Configuration	B-26
Figure B-21: 010_RWY_09 SHEAR Product Configuration	B-27
Figure B-22: RWY09 WARN Product Configuration	B-28
Figure B-23: TD_RWY_09 Product Schedule	B-29
Figure C-1: Vectors used for Velocity Correction In Earth Coordinates	C-4
Figure D-1: IRIS 3D Data Flow	D-2
Figure F-1: RAIN1 Raingage Correction Data Flow	F-3
Figure F-2: Example of Rain1GageCor.conf file	F-7
Figure F-3: Radar Data Averaging about a Raingage Location	F-9

Tables

Table 5-1: Default Picture Resolutions	3-16
Table 5-2: Suggested Monthly Melting Height Values	3-56
Table B-1: MONITOR MENUS	B-2
Table B-2: MONITOR Products	B-2
Table B-3: TD_RWY_09 Menu Configuration Names	B-3
Table B-4: TD_RWY_09 TASKS	B-3
Table B-5: TD_RWY_09 MONITOR Products	B-3