

B. Product Configuration Example

This appendix provides two examples of a set of operational parameters for IRIS, and convenient naming conventions for TASKS and products. The intention is to provide you with a starting point for defining the standard operational mode that is best for your particular application.

IRIS is a flexible system that lets you configure a variety of scan geometries and products. The IRIS configuration in the Radar Status menu provides a convenient mechanism for creating and saving entire sets of IRIS operating parameters. There are two operating modes illustrated here:

Weather Monitoring	This is an IRIS configuration named MONITOR, optimized for general weather monitoring and product generation.
Wind Shear Alert	Configured for each active runway of an air terminal. These shall be referred to as Terminal Doppler Weather Radar (TDWR) modes. They are optimized for the timely and accurate detection of wind shear events (requires optional SHEAR product).

Each of these modes of operation has a separate IRIS configuration and is described separately.

For installations whose primary responsibility is wind shear detection, you must switch between modes of IRIS operation by changing the IRIS configuration name in the Radar Status menu. For example, if there is no significant weather in the immediate area, the IRIS configuration is set to MONITOR. If there is weather in the wind shear detection zone, the IRIS configuration is set to a TDWR mode. An automatic Warning product in the MONITOR configuration (called SEVERE) signals when to switch into TDWR mode. After weather departs the terminal area, you manually reset the IRIS configuration back to the MONITOR mode in the Radar Status menu.

Note that to change the IRIS configuration, you must first turn off the Radar Process and Product Generator to deactivate IRIS. The various IRIS configurations are presented in the following sections.

In this appendix:

<i>Summary of Configuration Examples</i>	Section B.1
<i>Setting Up the Weather MONITOR Mode</i>	Section B.2
<i>Setting Up the Terminal Doppler Modes</i>	Section B.3

B.1 Summary of Configuration Examples

Table B–1: MONITOR MENUS

Menu	Name
Radar Status	MONITOR (or DEFAULT)
TASK Scheduler	MONITOR
Product Scheduler	MONITOR
Product Output	MONITOR

Table B–2: MONITOR Products

Product Type	Product Name	Associated TASK	Display Parameter	Configuration Parameter	Range
CAPPI	Z_010_120	PPI_VOL	Z	1.0 km Height	120
	Z_020_240	PPI_VOL	Z	2.0 km Height	240
	Z_030_240	PPI_VOL	Z	3.0 km Height	240
	Z_050_240	PPI_VOL	Z	5.0 km Height	240
	Z_100_240	PPI_VOL	Z	10.0 km Height	240
	Z_150_240	PPI_VOL	Z	15.0 km Height	240
MAX	Z_0_16_240	PPI_VOL	Z max	0 – 16 km Height	240
PPI	Z_005_300	SURVEILLANCE	mm liquid	0.5 Elevation	300
RAIN1	HOURLY	PPI_VOL	mm liquid	1 km CAPPI	240
RAINN	03_HOUR	PPI_VOL	mm liquid	3 hour rain	240
	06_HOUR	PPI_VOL	mm liquid	6 hour rain	240
	12_HOUR	PPI_VOL	mm liquid	12 hour rain	240
	24_HOUR	PPI_VOL	mm liquid	24 hour rain	240
RHI	Z_XXX_100	RHI	Z	Selectable AZ	100
TOPS	10_DBZ_240	PPI_VOL	height	10 dBZ Contour	240
TRACK	TRACK1	–NA–	–NA–	–NA–	–NA–
	TRACK2	–NA–	–NA–	–NA–	–NA–
VIL	010_180_240	PPI_VOL	mm liquid	1 to 18 km layer	240
VVP	VVP	VVP	wind	10 km height	60
WARN	SEVERE	PPI_VOL	message	3 km dBZ>30	240
XSECT	Z_SECTION	PPI_VOL	Z	Selectable Location	
	V_SECTION	PPI_VOL	V	Selectable Location	

Table B–3: TD_RWY_09 Menu Configuration Names

Menu	Name
Radar Status	TD_RWY_09
TASK Scheduler	TDWR
Product Scheduler	TD_RWY_09
Product Output	TDWR

Table B–4: TD_RWY_09 TASKS

TASK Name	Purpose
TDWR	Sector scanning over runway 09/27 at elevations .09 and 1.0

Table B–5: TD_RWY_09 MONITOR Products

Product Type	Product Name	Associated TASK	Display Parameter	Configuration Parameter	Range
PPI	010_RWY_09	TDWR	Z	EL 1.0 degrees	30
SHEAR	009_RWY_09	TDWR	Shear	EL 0.9 degrees	30
	010_RWY_09	TDWR	Shear	EL 1.0 degrees	30
WARN	RWY09	TDWR	Shear>10 m/s/km for both 0.9 and 1.0 EL angles. 3km ² area.		30

B.2 Setting Up the Weather MONITOR Mode

Step 1. Configure the Monitor TASKS

See the IRIS Radar Manual for instructions on this.

Step 2. Configure the MONITOR Products

The product mix for the MONITOR mode is summarized in Table B-2. This table also illustrates convenient naming conventions for products. For example Z_05_300 denotes a reflectivity PPI at elevation 0.5 degrees out to 300 km. Note that the name of the radar and the type of product, such as CAPPI, is given in menu and filename so it's not necessary to include them in product name. A special CAPPI product called Ground is made to be used as input for RAIN1 (just one height near the ground level) so it's an exception to the general naming convention. These conventions make it easier to identify the product by name. The Product Configuration menus for each product are shown in Figures B-1 through B-13. Note that configurations for the two TRACK products are not discussed explicitly, because they require only the name of the product — TRACK1 and TRACK2.

Figure B-1: Z_120 CAPPI Product Configuration

TASK SUMMARY	
TASK Name	PPI_VOL
DSP Data	Z V
Scan Mode	PPI Full
Max Range	240.0
Angle List	Az:Full Circle El:15 angles from 0.3 to 34.9

Map Projection	
Map Projection	Azimuthal Eqdist
Projection Name	

PRODUCT PARAMETERS		DISPLAY PARAMETERS	
Data:Display	Z : dBZ	Display Units	-32 to 96 dBZ
Max Range	120.0	Color Scale	Default
CAPPI Height	1.0 to 10.0	Levels	16
CAPPI Fill		1st Level/Step	N/A N/A
ZR relation	200 ** 1.60	Resolution	480 x 480 20
XY Smoother	0.0		

Figure B–2: GROUND CAPPI Product Configuration

This CAPPI is intended to be input for the RAIN1 product. Last number in resolution is 1 indicating that here is only one CAPPI Height.

SIGMET, rain CAPPI Product Configuration: GROUND			
File	Menus	Type	Commands
			Help
TASK SUMMARY			
TASK Name	<input type="text" value="PPI_VOL"/>	DSP Data	<input type="text" value="Z V"/>
Scan Mode	<input type="text" value="PPI Full"/>	Max Range	<input type="text" value="240.0"/>
Angle List	<input type="text" value="Az:Full Circle El:15 angles from 0.3 to 34.9"/>		
Map Projection	<input type="text" value="Azimuthal Eqdist"/>	Projection Name	<input type="text"/>
PRODUCT PARAMETERS		DISPLAY PARAMETERS	
Data:Display	<input type="text" value="Z : dBZ"/>	Display Units	<input type="text" value="-32 to 96 dBZ"/>
Max Range	<input type="text" value="80.1"/>	Color Scale	<input type="text" value="Default"/>
CAPPI Height	<input type="text" value="0.5"/>	Levels	<input type="text" value="16"/>
CAPPI Fill	<input type="checkbox"/>	1st Level/Step	<input type="text" value="N/A"/> <input type="text" value="N/A"/>
ZR relation	<input type="text" value="200 ** 1.60"/>	Resolution	<input type="text" value="480 x 480"/> <input type="text" value="1"/>
XY Smoother	<input type="text" value="0.0"/>		

Figure B–3: MAX150 MAX Product Configuration

In MAX, the last number of resolution sets the height of the side panels.

SIGMET, rain MAX Product Configuration: MAX150			
File	Menus	Type	Commands
			Help
TASK SUMMARY			
TASK Name	<input type="text" value="PPI_VOL"/>	DSP Data	<input type="text" value="Z V"/>
Scan Mode	<input type="text" value="PPI Full"/>	Max Range	<input type="text" value="240.0"/>
Angle List	<input type="text" value="Az:Full Circle El:15 angles from 0.3 to 34.9"/>		
Map Projection	<input type="text" value="Azimuthal Eqdist"/> <input type="checkbox"/>	Projection Name	<input type="text"/>
PRODUCT PARAMETERS		DISPLAY PARAMETERS	
Data:Display	<input type="text" value="Z : dBZ"/>	Display Units	<input type="text" value="-32 to 96 dBZ"/>
Max Range	<input type="text" value="150.0"/>	Color Scale	<input type="text" value="Uniform"/> <input type="checkbox"/>
Layer Top	<input type="text" value="10.0"/>	Levels	<input type="text" value="16"/> <input type="checkbox"/>
Layer Bottom	<input type="text" value="0.0"/>	1st Level/Step	<input type="text" value="3.0"/> <input type="text" value="3.0"/>
ZR relation	<input type="text" value="200 ** 1.60"/>	Resolution	<input type="text" value="720 x 720"/> <input type="text" value="60"/>
XY Smoother	<input type="text" value="1.0"/>		
XZ Smoother	<input type="text" value="1.0"/> <input type="text" value="0.5"/>		

Figure B-4: Z_005_300 PPI Product Configuration

SIGMET, rain PPI Product Configuration: Z_05_300			
File Menus Type Commands			Help
TASK SUMMARY			
TASK Name	<input type="text" value="SURVEILLANCE"/>	DSP Data	<input type="text" value="Z"/>
Scan Mode	<input type="text" value="PPI Full"/>	Max Range	<input type="text" value="300.0"/>
Angle List	<input type="text" value="Az:Full Circle El:One angle at 0.5"/>		
Map Projection	<input type="text" value="Azimuthal Eqdist"/>	Projection Name	<input type="text"/>
PRODUCT PARAMETERS		DISPLAY PARAMETERS	
Data:Display	<input type="text" value="Z : dBZ"/>	Display Units	<input type="text" value="-32 to 96 dBZ"/>
Max Range	<input type="text" value="300.0"/>	Color Scale	<input type="text" value="Default"/>
EL Angle	<input type="text" value="0.5"/>	Levels	<input type="text" value="16"/>
ZR relation	<input type="text" value="200 ** 1.60"/>	1st Level/Step	<input type="text" value="N/A"/> <input type="text" value="N/A"/>
XY Smoother	<input type="text" value="1.0"/>	Resolution	<input type="text" value="480 x 480"/> <input type="text" value="--"/>

Figure B–5: HOURLY RAIN1 Product Configuration

Note that you have to schedule and run the GROUND CAPPI product at least once before you can configure this one.

SIGMET, rain RAIN1 Product Configuration: HOURLY			
File	Menus	Type	Commands
			Help
TASK SUMMARY			
TASK Name	<input type="text" value="PPI_VOL"/>	DSP Data	<input type="text" value="Z V"/>
Scan Mode	<input type="text" value="PPI Full"/>	Max Range	<input type="text" value="240.0"/>
Angle List	<input type="text" value="Az:Full Circle El:15 angles from 0.3 to 34.9"/>		
PRODUCT PARAMETERS		DISPLAY PARAMETERS	
CAPPI	<input type="text" value="GROUND"/>	Display Units	<input type="text" value="0 to 100000 mm"/>
Clutter Map	<input type="checkbox"/>	Color Scale	<input type="text" value="Uniform"/>
ZR relation	<input type="text" value="200 ** 1.60"/>	Levels	<input type="text" value="8"/>
XY Smoother	<input type="text" value="1.0"/>	1st Level/Step	<input type="text" value="1.0"/> <input type="text" value="1.0"/>
Min dBZ	<input type="text" value="0.0"/>	Resolution	<input type="text" value="480 x 480"/> <input type="text" value="--"/>
Gage Cal	<input type="checkbox"/> <input type="text" value="Diag"/> <input type="checkbox"/>		

Figure B–6: 06_HOURS RAINN Product Configuration

Note that you have to schedule and run the HOURLY RAIN1 product at least once before you can configure this one.

SIGMET, rain RAINN Product Configuration: 06_HOURS			
File Menus Type Commands			Help
TASK SUMMARY			
TASK Name	PPI_VOL	DSP Data	Z V
Scan Mode	PPI Full	Max Range	240.0
Angle List	Az:Full Circle El:15 angles from 0.3 to 34.9		
PRODUCT PARAMETERS		DISPLAY PARAMETERS	
Rain1	HOURLY	Display Units	0 to 100000 mm
Hours	6	Color Scale	Default
XY Smoother	1.0	Levels	16
		1st Level/Step	N/A N/A
		Resolution	480 x 480

Configuration of the other RAINN Products is similar except for the time.

- 03_HOUR
- 12_HOUR
- 24_HOUR

Figure B-7: STAR_RHI RHI Product Configuration

SIGMET, rain RHI Product Configuration: STAR_RHI			
File	Menus	Type	Commands
Help			
TASK SUMMARY			
TASK Name	<input type="text" value="RHI"/>	DSP Data	<input type="text" value="Z"/>
Scan Mode	<input type="text" value="RHI"/>	Max Range	<input type="text" value="100.0"/>
Angle List	<input type="text" value="Az:One angle at 45.0 El:Sector"/>		
PRODUCT PARAMETERS		DISPLAY PARAMETERS	
Data:Display	<input type="text" value="Z : dBZ"/>	Display Units	<input type="text" value="-32 to 96 dBZ"/>
Max Range	<input type="text" value="-100.0 100.0"/>	Color Scale	<input type="text" value="Uniform"/>
Azimuth Ang	<input type="text" value="*"/>	Levels	<input type="text" value="2"/>
Max Height	<input type="text" value="10.0"/>	1st Level/Step	<input type="text" value="0.0"/> <input type="text" value="0.0"/>
ZR relation	<input type="text" value="200 ** 1.60"/>	Resolution	<input type="text" value="240 x 240"/> <input type="text" value="--"/>
XZ Smoother	<input type="text" value="2.0 1.0"/>		
Shear Filter	<input type="text" value="0.0"/>		

When azimuth angle is not specified but marked with an asterisk, IRIS will make a product for each of the scanned azimuths. Negative start range indicates “behind my back” or the other side of antenna, and lets you include two elevations (with distance of about 180 degrees) in the same picture.

Figure B–8: RAIN TOPS Product Configuration

Here the dBZ contour is selected to 10 dBZ to determine the top of precipitation.

SIGMET, rain TOPS Product Configuration: RAIN			
File	Menus	Type	Commands
			Help
TASK SUMMARY			
TASK Name	<input type="text" value="PPI_VOL"/>	DSP Data	<input type="text" value="Z V"/>
Scan Mode	<input type="text" value="PPI Full"/>	Max Range	<input type="text" value="240.0"/>
Angle List	<input type="text" value="Az:Full Circle El:15 angles from 0.3 to 34.9"/>		
Map Projection	<input type="text" value="Azimuthal Eqdist"/>	Projection Name	<input type="text"/>
PRODUCT PARAMETERS		DISPLAY PARAMETERS	
Data:Display	<input type="text" value="Z : Height"/>	Display Units	<input type="text" value="0 to 25.3 km"/>
Max Range	<input type="text" value="240.0"/>	Color Scale	<input type="text" value="Uniform"/>
dBZ Contour	<input type="text" value="10.0"/>	Levels	<input type="text" value="12"/>
XY Smoother	<input type="text" value="1.0"/>	1st Level/Step	<input type="text" value="0.0"/> <input type="text" value="1.0"/>
		Resolution	<input type="text" value="480 x 480"/> <input type="text" value="--"/>

Figure B–9: CLOUD TOP Product Configuration

Here the contour is set to –10 dBZ to detect the tops of any clouds near the radar.
Note that this might go below the smallest detectable signal at far ranges.

SIGMET, rain TOPS Product Configuration: CLOUD			
File	Menus	Type	Commands
			Help
TASK SUMMARY			
TASK Name	<input type="text" value="PPI_VOL"/>	DSP Data	<input type="text" value="Z V"/>
Scan Mode	<input type="text" value="PPI Full"/>	Max Range	<input type="text" value="240.0"/>
Angle List	<input type="text" value="Az:Full Circle El:15 angles from 0.3 to 34.9"/>		
Map Projection	<input type="text" value="Azimuthal Eqdist"/>	Projection Name	<input type="text"/>
PRODUCT PARAMETERS		DISPLAY PARAMETERS	
Data:Display	<input type="text" value="Z : Height"/>	Display Units	<input type="text" value="0 to 25.3 km"/>
Max Range	<input type="text" value="240.0"/>	Color Scale	<input type="text" value="Uniform"/>
dBZ Contour	<input type="text" value="-10.0"/>	Levels	<input type="text" value="12"/>
XY Smoother	<input type="text" value="1.0"/>	1st Level/Step	<input type="text" value="0.0"/> <input type="text" value="1.0"/>
		Resolution	<input type="text" value="480 x 480"/> <input type="text" value="--"/>

Figure B–10: VIL240 VIL Product Configuration

SIGMET, rain VIL Product Configuration: VIL240			
File Menus Type Commands			Help
TASK SUMMARY			
TASK Name	<input type="text" value="PPI_VOL"/>	DSP Data	<input type="text" value="Z V"/>
Scan Mode	<input type="text" value="PPI Full"/>	Max Range	<input type="text" value="240.0"/>
Angle List	<input type="text" value="Az:Full Circle El:15 angles from 0.3 to 34.9"/>		
Map Projection	<input type="text" value="Azimuthal Eqdist"/>	Projection Name	<input type="text"/>
PRODUCT PARAMETERS		DISPLAY PARAMETERS	
Data:Display	<input type="text" value="Z : VIL"/>	Display Units	<input type="text" value="0 to 65 mm"/>
Max Range	<input type="text" value="240.0"/>	Color Scale	<input type="text" value="Default"/>
Layer Top	<input type="text" value="10.0"/>	Levels	<input type="text" value="16"/>
Layer Bottom	<input type="text" value="1.0"/>	1st Level/Step	<input type="text" value="N/A"/> <input type="text" value="N/A"/>
ZW relation	<input type="text" value="20000 ** 1.6C"/>	Resolution	<input type="text" value="480 x 480"/> <input type="text" value="--"/>
XY Smoother	<input type="text" value="4.0"/>		

Figure B-11: VVP Product Configuration

SIGMET, rain VVP Product Configuration: DEFAULT			
File	Menus	Type	Commands
Help			
TASK SUMMARY			
TASK Name	<input type="text" value="VVP"/>	DSP Data	<input type="text" value="Z V"/>
Scan Mode	<input type="text" value="PPI Full"/>	Max Range	<input type="text" value="60.0"/>
Angle List	<input type="text" value="Az:Full Circle El:5 angles from 1.0 to 15.0"/>		
PRODUCT PARAMETERS		DATA CHOICES	
Data:Display	<input type="text" value="V : N/A"/>	Reflectivity	<input type="checkbox"/>
Min-Max Rng	<input type="text" value="1.0 60.0"/>	Vertical Wind	<input type="checkbox"/>
Min-Max Hgt	<input type="text" value="0.0 10.0"/>	Divergence	<input type="checkbox"/>
Height Lvl	<input type="text" value="20"/>	Deformation	<input type="checkbox"/>
Bin Quota	<input type="text" value="10000"/>		
Unfolding	<input type="checkbox"/>		

Figure B–12: RWY_45 XSECT Product Configuration

Even though most cross sections are made interactively in the Quick Look window, it may be useful to have a standard cross section along or crossing a line of interest, such as a runway.

SIGMET, rain XSECT Product Configuration: RWY45			
File	Menus	Type	Commands
			Help
TASK SUMMARY			
TASK Name	<input type="text" value="PPI_VOL"/>	DSP Data	<input type="text" value="Z V"/>
Scan Mode	<input type="text" value="PPI Full"/>	Max Range	<input type="text" value="240.0"/>
Angle List	<input type="text" value="Az:Full Circle El:15 angles from 0.3 to 34.9"/>		
PRODUCT PARAMETERS		DISPLAY PARAMETERS	
Data:Display	<input type="text" value="Z : dBZ"/>	Display Units	<input type="text" value="-32 to 96 dBZ"/>
Height Width	<input type="text" value="15.0 50.0"/>	Color Scale	<input type="text" value="Default"/>
Center (x,y)	<input type="text" value="0.0 0.0"/>	Levels	<input type="text" value="16"/>
Angle	<input type="text" value="45.0"/>	1st Level/Step	<input type="text" value="N/A"/> <input type="text" value="N/A"/>
ZR relation	<input type="text" value="200 ** 1.60"/>	Resolution	<input type="text" value="600 x 290"/> <input type="text" value="--"/>
XZ Smoother	<input type="text" value="0.0 0.0"/>		

Figure B–13: SEVERE WARN Product Configuration

SIGMET, rain WARN Product Configuration: Severe

File Menus Type Commands Help

Warning Symbol

Area in Sq Km

Type	Product Name	Time	Threshold
<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
1	CAPPI	Z_150	00:00:00 > 40.00
2			
3			

Apply Clear

PROTECTED AREAS FOR WARNING ALERT

☐ 15L_RWY

TDWR Style ☐ Say/Beep Warning ☐ Make Diagnostic ☐

Step 3. Configure the Product Scheduler for the MONITOR Mode

The Product Scheduler configuration is shown in Figure B–14. Note that you may need to scroll the menu to see the entire configuration.

Figure B-14: MONITOR Mode Product Schedule

wind Product Scheduler: MONITOR										
File Menus Commands										Help
Display <div>KI8</div> <div>19/19 Products</div> Add for <div>KI8</div> Site Group <div>1</div>										
Site	Product	Data	TASK	Next-Data-Time	Skip	Rqst	Status	Runs		
	CAPPI	—Products—								
KI8	CAPPI	Z_010_120	Z	PPI_VOL	09:00 5 Jun 90	00:00	All	Wait	200	
KI8	CAPPI	Z_020_240	Z	PPI_VOL	09:00 5 Jun 90	00:00	All	Wait	200	
KI8	CAPPI	Z_030_240	Z	PPI_VOL	09:00 5 Jun 90	00:00	All	Wait	200	
KI8	CAPPI	Z_050_240	Z	PPI_VOL	09:00 5 Jun 90	00:00	All	Wait	200	
KI8	CAPPI	Z_100_240	Z	PPI_VOL	09:00 5 Jun 90	00:00	All	Wait	200	
KI8	CAPPI	Z_150_240	Z	PPI_VOL	09:00 5 Jun 90	00:00	All	Wait	200	
	MAX	—Products—								
KI8	MAX	Z_0_16_240	Z	PPI_VOL	09:00 5 Jun 90	00:00	All	Wait	200	
	PPI	—Products—								
KI8	PPI	Z_005_300	Z	SURVEIL	09:08 5 Jun 90	00:00	All	Wait	200	
	RAIN1	—Products—								
KI8	RAIN1	HOURLY	Liq	PPI_VOL	09:00 5 Jun 90	00:00	All	Wait	200	
	RAINN	—Products—								
KI8	RAINN	03_HOUR	Liq	PPI_VOL	09:00 5 Jun 90	00:00	All	Wait	200	
KI8	RAINN	06_HOUR	Liq	PPI_VOL	09:00 5 Jun 90	00:00	All	Wait	200	
KI8	RAINN	12_HOUR	Liq	PPI_VOL	09:00 5 Jun 90	00:00	All	Wait	200	
KI8	RAINN	24_HOUR	Liq	PPI_VOL	09:00 5 Jun 90	00:00	All	Wait	200	
	RAW	—Products—								
	RHI	—Products—								
KI8	RHI	Z_XXX_100	Z	RHI	07:14 5 Jun 90	00:00	All	Wait	10	
	TOPS	—Products—								
KI8	TOPS	10_DBZ_240	Tops	PPI_VOL	09:00 5 Jun 90	00:00	All	Wait	200	
	VIL	—Products—								
KI8	VIL	010_180_240	VIL	PPI_VOL	09:00 5 Jun 90	00:00	All	Wait	200	
	VVP	—Products—								
KI8	VVP	VVP	Wind	VVP	09:10 5 Jun 90	00:00	All	Wait	200	
	WARN	—Products—								
KI8	WARN	SEVERE	X		09:10 5 Jun 90	00:00	All	Running	200	
	XSEXT	—Products—								
KI8	XSECT	Z_SECTION	Z	PPI_VOL	07:00 5 Jun 90	00:00	Stop	Wait	200	

Step 4. Configure the Radar Status Menu for the MONITOR Mode

The top part of the Radar Status menu should be configured and saved as shown in Figure B–15.

Figure B–15: MONITOR Mode Radar Status Menu

wind Radar Status: MONITOR			
File	Menus	Commands	Mode
Control Section			
TASK Name	<input type="checkbox"/> MONITOR	Product Sched	<input type="checkbox"/> MONITOR
Output Sched	<input type="checkbox"/> MONITOR		
Radar Process	<input checked="" type="checkbox"/> On	Product Gen	<input checked="" type="checkbox"/> Idle
Radiate	<input type="checkbox"/> On	Re-Ingest	<input checked="" type="checkbox"/> Idle
T/R Power	<input checked="" type="checkbox"/> On	NORDRAD	<input checked="" type="checkbox"/> Stopped
Servo Power	<input checked="" type="checkbox"/> On	Messages	<input type="checkbox"/> 0
		Site Status	<input type="checkbox"/> SIG
SUBSYSTEM STATUS		ANTENNA/TRANSMITTER STATUS	
DSP	OK	None	
RCP	OK	Computer	
WINDOW1	OK	Output	node:0.0
ARCHIVE2	OK	Tape	
		Azimuth	212.1
		Velocity	2.7
		Elevation	0.3
		Velocity	0.0
		BITE	OK
		Waveguide	Normal
		Transmit	Radiate
		Interlock	N/A
		Magnetron	Normal
		Air Flow	Normal

Note that there are two options regarding start-up:

- Start-up in standby DEFAULT mode.

If you want IRIS to start-up in a standby mode, make a separate DEFAULT configuration that has the radar process, product generator, radiate and servo power in the off position. Then switch the IRIS configuration to MONITOR. Note that the radar process and product generator must be set to off before IRIS lets you switch the IRIS configuration to MONITOR.

- Start-up in MONITOR mode

If you want IRIS to be in MONITOR mode when IRIS starts, name the IRIS configuration DEFAULT.



CAUTION: If the radar antenna motion or radiation could pose a personnel hazard on automatic start-up, do not use this approach.

Step 5. Configure the MONITOR Output Assignments

The output configuration in the Product Output menu varies from system-to-system. Here are some hints for best performance.

- Determine what products to send to the various output devices and network computers on a regular basis. The output from these products should be directed to the corresponding devices and the configuration should be saved as MONITOR in the Product Output menu.
- In this example of the MONITOR configuration, the Warning product called SEVERE is used to signal when there is significant weather in a protected area, called TERMINAL. For wind shear applications, the corresponding warning situation display should be sent to a display so that the location of the warning can be viewed. When this warning product indicates the presence of weather in the terminal area, the IRIS configuration should be switched to the wind shear alert mode (see the TDWR example in Section B.3).

Step 6. Test the MONITOR Configuration

The configuration should be tested to verify that it is functioning properly, as follows:

- Verify that the TASK schedule can run on schedule without falling behind. Note that RHI's are done only on an *ad hoc* basis through interesting weather. If you fall behind, you should consider eliminating the separate VVP TASK and using the PPI_VOL TASK for VVP products. You can also eliminate the highest angle in PPI_VOL. Other performance trade-off factors are discussed in this manual.
- Verify that the product schedule can run without falling behind. For the example, the products are scheduled on a 15-minute basis. This is verified by checking the Product Scheduler times. Note that the system may temporarily fall behind at the beginning of an hour because there is considerable processing related to the RAIN1 and RAINN products, which occur on the hour.

If the product schedule consistently falls behind, reduce the number of products set to "All" to those that are used most often. For example, you may not need all the different CAPPI heights. You should also verify that the Product Configuration menu's Smoother field is not set to a large value, or turn the Smoother off (set to 0) in products that require little smoothing.

- View each product to verify that it is being generated properly and that the color scales are appropriate for your season and location. You will probably need to tune the color scales in the Product Configuration menus to match the intensity of precipitation.
- For wind shear detection applications, verify that the SEVERE product (used for indicating when to switch from the MONITOR to the TDWR mode) is appropriate for your application. The suggested product sounds a warning whenever there is an area of 10 sq. km or greater of 30 dBZ or greater echo at 3 km height in a protected area called TERMINAL. TERMINAL should be an area centered about the air terminal (nominally a box 60 km on each side). This product should be tuned by changing the area size and the threshold so that sensitivity is maintained with a low false alarm ratio.

B.3 Setting Up the Terminal Doppler Modes

This IRIS configuration is optimized for the detection of hazardous wind shear. The configuration should be adjusted to match the specific runway configuration as well as the climatology of wind shear events in your location.



SIGMET does not warrant that the SHEAR /WARN product will detect all hazardous microburst conditions. Whenever convective storms are in an air terminal area, there is danger of microburst and normal precautions to avoid suspected wind shear should be used, even if the SHEAR/WARN algorithm does not detect shear. The SHEAR/WARN product is only one of many indicators that such a hazardous condition may exist. SIGMET, Inc. shall not be liable for damages of any kind for failure of the SHEAR/WARN algorithm to detect hazardous wind shear or for false alarms that may occur from use of the SHEAR/WARN algorithm.

It is recommended that you construct a separate IRIS configuration for each active runway configuration. The example presented here for illustration purposes is for a single east/west runway (09/27). The IRIS configurations are named to correspond to the active runway. In this case there are two choices:

- TD_RWY_27
- TD_RWY_09

TD indicates that this is a Terminal Doppler mode configuration.

The operator selects the appropriate configuration for the active runway whenever there is significant weather in the terminal area. An automatic warning product such as SEVERE in the MONITOR mode can be set-up to signal the operator when weather enters the terminal area (for example, within 20 km).

In the example presented here, it is assumed that the radar is sited off the airport to the north. During Terminal Doppler mode, the radar scans in a sector scan over the airport at two elevation angles — 0.9 and 1.0 degrees. The SHEAR product is calculated for each elevation angle. A “two-look” warning product is used to determine if hazardous wind shear is present — hazardous shear must be present at the same location in both elevations and in a protected area before a warning is sounded.

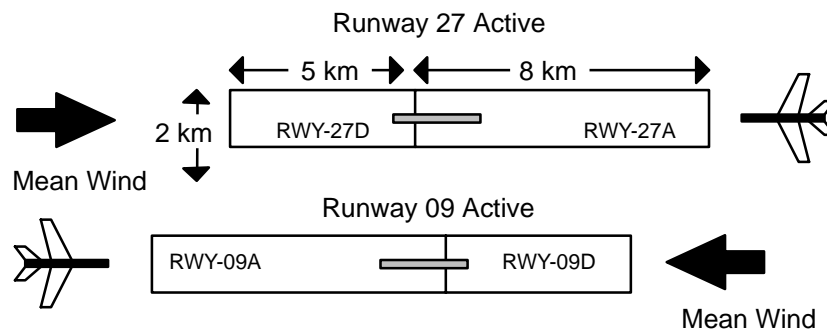
The configuration steps are described below. The TD_RWY_09 case is described first.

Step 1. Configure the Protected Areas

This is done in the **setup** utility. For the case of a single east/west runway, the following areas are suggested (see also Figure B–16).

Protected Area	Name	Center East of Radar	Center North of Radar	Width E – W	Width N – S	Orientation
1	ALL	0 km	0 km	500 km	500 km	0 degrees
2	TERMINAL	Center on Terminal		40	40	0
3	RWY_09A	See Figure		8	2	0
4	RWY_09D			5	2	0
5	RWY_27A			8	2	0
6	RWY_27D			5	2	0

Figure B–16: TD_RWY_09 and TD_RWY_27 Protected Areas



The locations of the areas can be checked by making and displaying a warning product with each area.

Step 2. Configure the TDWR TASK

It is assumed here that a single TASK called TDWR is used to cover all runways. It is a sector scan covering 90 to 270 degrees — the region south of the radar. (The radar is located north of the field.) The example in Figure B–17 is for an RVP5 signal processor.

The elevation angles in the example are 0.9 and 1.0 degrees. These will be used for the “two-look” warning example. The wind shear threshold must be exceeded for the same location on both of these elevation “looks.” The specific elevations appropriate

for a particular installation vary, depending on the radar siting and clutter characteristics. Wind shear can be a very shallow phenomenon, so the two elevation angles should be as close to the ground as is permitted by the clutter environment. The elevation angles should be separated by 0.1 degrees in the range of values from 0.3 to 1.0.

Figure B–17: TDWR TASK Configuration

wind TASK Configuration: TDWR									
File Menus Commands								Help	
Description		Terminal Doppler Sector Scan							
ANTENNA /RADAR CONTROL									
Scan Mode	<input type="text" value="PPI Sector"/>	Resolution	<input type="text" value="1.0"/>	Pulse Width	<input type="text" value="1.0"/>				
Azimuth	<input type="text" value="90.0 270.0"/>			Gain Control	<input type="text" value="STC"/>				
Elevation	<input type="text" value="2 Tilts from 09 to 1.0"/>			Polarization	<input type="text" value="Fixed"/>				
PROCESSOR CONFIGURATION									
DSP Data	<input type="text" value="ZV"/>	Start Range	<input type="text" value="0.0"/>	Vel Unfold	<input type="text" value="None"/>				
Samples	<input type="text" value="60"/>	Bin Spacing	<input type="text" value="250.00"/>	High PRF	<input type="text" value="1000 (2000)"/>				
Filter Dop	<input type="text" value="3"/>	Range Avg	<input type="text" value="None"/>	Low PRF	<input type="text" value="1000 (2000)"/>				
Filter Log	<input type="text" value="10"/>	Max Range	<input type="text" value="38.0"/>	Unamb Vel	<input type="text" value="13.3"/>				
Input Bins	<input type="text" value="149"/>	Unamb Range	<input type="text" value="149.9"/>	Major Mode	<input type="text" value="PPP"/>				
Output Bins	<input type="text" value="149"/>								
DATA QUALITY THRESHOLDING									
T Threshold	<input type="text" value="LOG"/>	LOG	SIG	CSR	SQI	<input type="text" value="Default"/>			
Z Threshold	<input type="text" value="LOG & CSR"/>								
V Threshold	<input type="text" value="SQI & CSR"/>					Speckle			
W Threshold	<input type="text" value="LOG & SIG & SQI"/>	<input type="text" value="0.82"/>	<input type="text" value="10.0"/>	<input type="text" value="18.0"/>	<input type="text" value="0.40"/>	<input type="text" value="Z"/>	<input type="text" value="V"/>		

Step 3. Configure the TDWR TASK Schedule

There is only one TASK scheduled in this case. The repeat time may be reduced by trial depending on the load on your system due to networking or multiple users and the specific product mix that you use. Performance is improved slightly if the real time display is turned off.

Figure B-18: TDWR Task Schedule

wind TASK Scheduler: TDWR											
File Menus Commands											Help
ID	TASK	Command	Scan	Range	Data	Start	Stop	Repeat	RunTime	Mand	Skip
1	TDWR	Running	PPIS	38	ZV	00:00:00	-None-	00:01:30	00:00:30	Yes	No

Step 4. Configure the TD_RWY_09 Products

There are four products used in this example. Three are required, while one is optional and can be omitted to improve performance:

PPI: Z_010_30	Optional. A PPI of Z for the 1.0 degree elevation scan to 30 km range. This serves as a general purpose display for this mode of operation. The situation display is overlaid on top of this for the RWY09 WARN product.
SHEAR: TD_009_30	A SHEAR product at 0.9 degrees elevation to 30 km range. Used for the RWY09 WARN product.
SHEAR: TD_010_30	A SHEAR product at 1.0 degrees elevation to 30 km range. Used for the RWY09 WARN product.
WARN: RWY09	Requires that shear be detected at both the elevation angles in the same location. This minimizes false alarms while maintaining sensitivity. This TASK uses the runway 09 protected areas.

Recommended product configurations are given in Figures B-19 through B-22.

Figure B–19: Z_010_30 PPI Product Configuration

wind PPI Product Configuration: Z_010_30			
File	Menus	Type	Commands
Help			
TASK SUMMARY			
TASK Name	<input type="text" value="PPI_VOL"/>	DSP Data	<input type="text" value="ZV"/>
Scan Mode	<input type="text" value="PPI Full"/>	Max Range	<input type="text" value="240.0"/>
Angle List	<input type="text" value="AZ: Full Circle EL: 6 angles from 0.5 to 10.0"/>		
PRODUCT PARAMETERS		DISPLAY PARAMETERS	
Data:Display	<input type="text" value="Z : dBZ"/>	Display Units	<input type="text" value="-32 to 96 dB"/>
Max Range	<input type="text" value="30.0"/>	Color Scale	<input type="text" value="Default"/>
EL Angle	<input type="text" value="0.9"/>	Levels	<input type="text" value="16"/>
ZR Relation	<input type="text" value="200 ** 1.6"/>	1st Level/Step	<input type="text" value="N/A"/> <input type="text" value="N/A"/>
XY Smoother	<input type="text" value="0.50"/>	Resolution	<input type="text" value="480 x 480"/>
		Storage Format	<input checked="" type="checkbox"/> Data <input type="checkbox"/> Pict

Figure B–20: TD_009_30 SHEAR Product Configuration

wind SHEAR Product Configuration: TD_009_30			
File	Menus	Type	Commands
Help			
TASK SUMMARY			
TASK Name	<input type="text" value="TDWR"/>	DSP Data	<input type="text" value="ZV"/>
Scan Mode	<input type="text" value="PPI Sector"/>	Max Range	<input type="text" value="38.0"/>
Angle List	<input type="text" value="AZ: 90.0 to 270.0"/> <input type="text" value="EL: 2 Tilts from 0.9 to 1.0"/>		
Map Projection	<input type="text" value="Azimuthal Eqdist"/>	Projection Name	<input type="text"/>
PRODUCT PARAMETERS		DISPLAY PARAMETERS	
Data:Display	<input type="text" value="V : Shear"/>	Display Units	<input type="text" value="+- 25m/s/km"/>
Max Range	<input type="text" value="30.0"/>	Color Scale	<input type="text" value="Default"/>
EL Angle	<input type="text" value="0.9"/>	Levels	<input type="text" value="15"/>
Rng/Az Filter	<input type="text" value="1.50"/> <input type="text" value="0.0"/>	1st Level/Step	<input type="text" value="N/A"/> <input type="text" value="N/A"/>
XY Smoother	<input type="text" value="0.0"/>	Resolution	<input type="text" value="480 x 480"/>
Shear Type	<input type="text" value="Asimuthal"/>	Storage Format	<input checked="" type="checkbox"/> Data <input type="checkbox"/> Pict
<input type="checkbox"/> VVP	<input type="text" value="DEFAULT"/>		
VVP age	<input type="text" value="10"/>		

Figure B–21: 010_RWY_09 SHEAR Product Configuration

wind SHEAR Product Configuration: 010_RWY_09			
File	Menus	Type	Commands
Help			
TASK SUMMARY			
TASK Name	<input type="text" value="TDWR"/>	DSP Data	<input type="text" value="ZV"/>
Scan Mode	<input type="text" value="PPI Sector"/>	Max Range	<input type="text" value="38.0"/>
Angle List	<input type="text" value="AZ: 90.0 to 270.0"/> <input type="text" value="EL: 2 Tilts from 0.9 to 1.0"/>		
Map Projection	<input type="text" value="Azimuthal Eqdist"/>	Projection Name	<input type="text"/>
PRODUCT PARAMETERS		DISPLAY PARAMETERS	
Data:Display	<input type="text" value="V : Shear"/>	Display Units	<input type="text" value="+- 25m/s/km"/>
Max Range	<input type="text" value="30.0"/>	Color Scale	<input type="text" value="Default"/>
EL Angle	<input type="text" value="0.9"/>	Levels	<input type="text" value="15"/>
Rng/Az Filter	<input type="text" value="1.50"/> <input type="text" value="0.0"/>	1st Level/Step	<input type="text" value="N/A"/> <input type="text" value="N/A"/>
XY Smoother	<input type="text" value="0.0"/>	Resolution	<input type="text" value="480 x 480"/>
Shear Type	<input type="text" value="Asimuthal"/>	Storage Format	<input checked="" type="checkbox"/> Data <input type="checkbox"/> Pict
<input type="checkbox"/> VVP	<input type="text" value="DEFAULT"/>		
VVP age	<input type="text" value="10"/>		

Figure B–22: RWY09 WARN Product Configuration

wind WARN Product Configuration: RWY09

File Menus Type Commands Help

Warning Symbol

MRW

Area in Sq Km

3.0

Type

Product Name

Time

Threshold

☐

Apply

Clear

1	SHEAR	TD_009_30	00:00:00	10.0
2	SHEAR	TD_010_30	00:00:00	10.0
3				

Protected Areas for Warning Alert

☐

RWY_09A

RWY_09D

TDWR Style

☒

Say Warning

☒

Step 5. Configure the TD_RWY_09 Product Scheduler

The Product Scheduler is shown in Figure B–23. All products are set to “All.” Note that the PPI product is not required for the warnings, so it can be deleted to improve performance. It is useful for depicting the intensity of precipitation over the terminal area.

Figure B-23: TD_RWY_09 Product Schedule

wind Product Shceduler: TD_RWY_09

File Menus Commands Help

Display KI8
4/4 Products

Add for KI8

Site Group 1

Site	Product	Data	TASK	Next-Data-Time	Skip	Rqst	Status	Runs
	CAPPI	—Products—						
	MAX	—Products—						
	PPI	—Products—						
KI8	PPI	Z_010_30	Z	TDWR	09:08 5 Jun 90	00:00	All Wait	200
	RAIN1	—Products—						
	RAINN	—Products—						
	RAW	—Products—						
	RHI	—Products—						
	SHEAR	—Products—						
KI8	SHEAR	TD_009_30	Z	TDWR	09:08 5 Jun 90	00:00	All Wait	200
KI8	SHEAR	TD_010_30	Z	TDWR	09:08 5 Jun 90	00:00	All Wait	200
	TOPS	—Products—						
	VIL	—Products—						
	VVP	—Products—						
	WARN	—Products—						
KI8	WARN	RWY09	X		08:59 5 Jun 90	00:00	All Running	200
	XSEXT	—Products—						

Step 6. Configure the Product Output Menu

For best performance, product output should be minimized so there is no extra burden from non-essential users. For network use, the RWY09 Warning product can be sent very efficiently and contains a schematic depiction of the location of any microbursts (indicated by MBW) and a text summary of any microbursts detected in a protected area. Here is a recommendation:

- Set all TDWR WARN products (for example, RWY09 and RWY27) to “All” for an output device to be used for warnings. Save the product output configuration as TDWR.
- Optionally, depending on your communications speed and network CPU burdens, set the Z_010_30 PPI to “All.” You can also select the appropriate warning overlay (for example, RWY09), but remember to change it when you change runway configurations. If you want to avoid having to remember to make this

change, you can save the product output configuration to a distinct name for each runway configuration, such as TD_RWY_09.

Remember that if you send to a networked IRIS system, it must be properly configured to display the products when they arrive. The best way to do this is to make a product output configuration at the receiving IRIS system which automatically displays any of the shear warning products. Tag the output of the shear warning situation displays with “All” and save the product output configuration.

Step 7. Configure the Opposite Runway (runway 27)

In most cases, the opposite runway is configured identically, except that the protected areas receive different names. Having configured runway 09, runway 27 is configured as follows:

IRIS Configuration	In the Radar Status menu, save the configuration under a different name, such as TD_RWY_27.
TASK Schedule	Leave as TDWR.
Product Configuration	Make a WARN product called RWY27, identical to RWY09, except that the protected areas are RWY_27A and RWY_27D. This is easily done using the Save command and modifying the product configuration.
Product Scheduler	Replace the RWY09 WARN product with RWY27 in the Product Scheduler. Save it to a new product schedule named TD_RWY_27.

When you are done, the Radar Status menu should show:

IRIS Configuration	TD_RWY_27
TASK Schedule	TDWR
Prod Schedule	TD_RWY_27
Output Config	TDWR

Step 8. Configure the Other Runways

Configure other runways similar to the examples shown here. The naming conventions here serve as guidelines. For many installations similar to the example presented here, the radar scanning is the same regardless of the active runways. The only difference is the protected areas used in the Warning product so that only the Product Scheduler is different for different runway configurations. In this case, the TASK Schedule remains simply TDWR, and it is used for all configurations (similar to the use of the name TDWR for the product output configuration).

Step 9. Test and Tune the Configurations

The detection of hazardous wind shear is still in the experimental stages in the scientific and engineering community. The approaches used in IRIS have been tested on actual documented cases of hazardous wind shear.

Tuning the system for best results requires some experience and knowledge of both radar and wind shear. IRIS is site adaptable since every location and climate is different. It is recommended that a qualified engineer/scientist make a thorough evaluation of each installation, both before and after the radar is installed. SIGMET can assist with this or recommend independent consultants.

This manual discusses many of the testing and tuning steps. See the sections on TASK Configuration and SHEAR Product Configuration. The system should be tested by running each configuration in actual weather. Some important features to check are summarized below:

Check the protected areas

Run each runway configuration and observe the warning situation display. Are the protected areas shown in the warning situation display correct? If you are uncertain, modify the WARN product to display one at a time.

Check that warnings are generated

Reduce the threshold shear in the warning product configuration from 10 to 5 or 0 when there is weather in the terminal area. This should cause false alarms, which will allow you to test that warnings are being generated. Be sure to reset the threshold back to 10 for both elevation angles.

Check that the velocities are reasonable

With weather in the terminal area, observe the real time display and verify that the velocity pattern provides good coverage of non-zero velocities. If the velocities are all 0, check the TASK configuration. If that is correct, check the coherency of your radar system. (See the *IRIS Utilities Manual, Ascope Utility*)

Check that the selected elevation angles are reasonable for your clutter pattern

Observe the reflectivity pattern on the real time display to verify that the selected elevation angles are appropriate to the clutter pattern of your site. You can experiment with different angles in the range 0.5 to 1.0 degrees to see which give the best results. Clutter performance can be enhanced by increasing the number of samples in the TASK (for example, from 60 to 70), increasing the PRF, using the next wider clutter filter. (See Chapter 3.)

Check the SHEAR Products

The SHEAR products can be displayed and compared against the velocities. You may want to make a PPI velocity product to the same scale to assist with the comparison. Verify that the coverage and values of the SHEAR product are consistent with that of the velocity product.

Tune the WARN Product

The WARN product has two tuning parameters — the threshold area and the SHEAR threshold. Increasing either of these will make the algorithm less sensitive (fewer false alarms). Decreasing either of these will make the algorithms more sensitive. Remember that the shear threshold is quantized to the color bands in the shear product (steps of 5 m/s/km in this example). It is recommended that tuning be done with the area rather than the SHEAR threshold. For more sensitivity, set the area to 2.0 km². If false alarms are a problem increase the area from 3.0 to 3.5 then 4.0 km².

Several other steps can be taken to tune the WARN product. One is to change the warning criteria. The example here is a “two look” shear approach. However, a single look (one elevation angle) approach can also be used, either alone or perhaps using reflectivity as the second constraint based on the PPI Z product.

Record some test cases

During the first few months of operation, it is a good idea to record some RAW test cases on tape when there is wind shear within range. This allows you to play the events back and make shear products and warnings to evaluate and tune the configurations. Make a RAW product for your terminal Doppler scan and add it to the product schedule. However, set the Request field to “Stop.” Then when an alarm sounds, set the RAW next data time back to 5 minutes before the alarm time and set the Request to “All.” Finally, go to Product Output menu and Tape menu to direct the output to an IRIS tape. Be aware that the addition of the RAW product may cause your schedule to fall behind. If this is the case, you can temporarily add 15 to 30 seconds to the repeat time in the TASK Scheduler.

Note that microburst warning symbols (without audio alarm) are shown on the situation display when the event is outside of the protected areas. These are excellent opportunities for recording RAW data.