

## B. Task 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:

<b>Weather Monitoring</b>	This is an IRIS configuration named MONITOR, optimized for general weather monitoring and product generation.
<b>Wind Shear Alert</b>	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.

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<i>Summary of Configuration Examples</i>	<b>Section B.1</b>
<i>Setting Up the Weather MONITOR Mode</i>	<b>Section B.2</b>

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## 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 TASKS**

TASK Name	Purpose
PPI_VOL	General product generation
SURVEILLANCE	Long range surveillance PPI
VVP	Wind profiling
RHI	<i>Ad hoc</i> RHI's through significant weather
MANUAL	<i>Ad hoc</i> manual scanning

**Table B–3: 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

**Table B–3: MONITOR Products (cont.)**

Product Type	Product Name	Associated TASK	Display Parameter	Configuration Parameter	Range
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–4: 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–5: TD\_RWY\_09 TASKS**

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

**Table B–6: 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 <sup>2</sup> area.		30

## B.2 Setting Up the Weather MONITOR Mode

### Step 1: Configure the Monitor TASKS

There are four TASKS used for the Monitor mode:

<b>SURVEILLANCE</b>	A single-tilt PPI at 0.5 degrees of elevation to 300 km range for long range weather monitoring.
<b>PPIVOL</b>	A 15-tilt volume scan TASK to 240 km range. Most of the products are derived from this TASK, which runs continuously.
<b>RHI</b>	A single RHI sweep to 100 km at an angle selected in real time. Run this TASK on an <i>ad hoc</i> basis when there is interesting weather.
<b>MANUAL</b>	A manual scan to 100 km for interactive scanning, identical to the RHI scan except that the scan mode is set to "Manual."

Recommended TASK configurations are shown in Figures B–1 through B–2. Each should be tuned based on your requirements, experience, and the particular characteristics of your radar and site.

Figure B-1: SURVEILLANCE TASK Configuration

SIGMET, rain TASK Configuration: SURVEILLANCE			
File Menus Commands			Help
Description: Single elevation PPI, May, 2001			
<b>ANTENNA /RADAR CONTROL</b>			
Scan Mode	PPI Full <input type="checkbox"/>	Resolution	1.000
Azimuth	Full Circle		Pulse Width
Elevation	One angle at 0.5		Gain Control
Scan Speed	18.00 deg/sec		Polarization
			Horiz <input type="checkbox"/>
<b>PROCESSOR CONFIGURATION</b>			
DSP Data	Z	Start Range	1.000 km
Samples	40	Bin Spacing	1000.0 m
Filter Dop	2 <input type="checkbox"/>	Range Avg	None
Filter Log	3 <input type="checkbox"/>	Max Range	300.0 km
Input Bins	300	Unamb Range	599.6 km
Output Bins	300	Vel Unfold	None <input type="checkbox"/>
		High PRF	250 Hz
		Low PRF	250 Hz
		Unamb Vel	3.1 m/s
		Major Mode	PPP <input type="checkbox"/>
<b>DATA CORRECTIONS</b>			
Clutter Map	<input type="checkbox"/>	Beam Blockage	<input type="checkbox"/>
		Unfold VC	<input type="checkbox"/>
		Attenuation	<input type="checkbox"/>
		Remove Fallspeed in VC	<input type="checkbox"/>
<b>DATA QUALITY THRESHOLDING</b>			
T	LOG	LOG	SIG
Z	LOG & CSR	CSR	SQI
V	SQI & CSR		
W	SQI & CSR		
ZDR	All Fail		
		0.8dB	5 dB
		18 dB	0.40
		Defaults	
		Speckle	
		<input type="checkbox"/> Z	<input type="checkbox"/> V

Figure B-2: PPI\_VOL TASK Configuration

SIGMET, rain TASK Configuration: PPI_VOL			
File	Menus	Commands	Help
Description: Volume scan ES Oct 2001			
<b>ANTENNA /RADAR CONTROL</b>			
Scan Mode	PPI Full <input type="checkbox"/>	Resolution <input type="text" value="1.000"/>	Pulse Width <input type="text" value="0.50"/>
Azimuth	<input type="text" value="Full Circle"/>		Gain Control <input type="text" value="Fixed"/>
Elevation	<input type="text" value="15 angles from 0.3 to 34.9"/>		Polarization <input type="text" value="Horiz"/>
Scan Speed	<input type="text" value="18.00 deg/sec"/>		
<b>PROCESSOR CONFIGURATION</b>			
DSP Data <input type="checkbox"/> Z <input type="checkbox"/> V	Start Range <input type="text" value="1.000 km"/>	Vel Unfold <input type="text" value="None"/>	
Samples <input type="text" value="40"/>	Bin Spacing <input type="text" value="1000.0 m"/>	High PRF <input type="text" value="620 Hz"/>	
Filter Dop <input type="text" value="2"/>	Range Avg <input type="text" value="None"/>	Low PRF <input type="text" value="620 Hz"/>	
Filter Log <input type="text" value="3"/>	Max Range <input type="text" value="240.0 km"/>	Unamb Vel <input type="text" value="7.8 m/s"/>	
Input Bins <input type="text" value="240"/>	Unamb Range <input type="text" value="241.8 km"/>	Major Mode <input type="text" value="FFT"/>	
Output Bins <input type="text" value="240"/>			
<b>DATA CORRECTIONS</b>			
Clutter Map <input type="checkbox"/>	Beam Blockage <input type="checkbox"/>	Attenuation <input type="checkbox"/>	
	Unfold VC <input type="checkbox"/>	Remove Fallspeed in VC <input type="checkbox"/>	
<b>DATA QUALITY THRESHOLDING</b>			
T <input type="checkbox"/>	<input type="text" value="LOG"/>	LOG <input type="text" value="0.8 dB"/>	SIG <input type="text" value="5 dB"/>
Z <input type="checkbox"/>	<input type="text" value="LOG &amp; CSR"/>	CSR <input type="text" value="18 dB"/>	SQI <input type="text" value="0.40"/>
V <input type="checkbox"/>	<input type="text" value="SQI &amp; CSR"/>		
W <input type="checkbox"/>	<input type="text" value="SIG &amp; SQI &amp; LOG"/>		
ZDR <input type="checkbox"/>	<input type="text" value="All Fail"/>		
<input type="button" value="Defaults"/>			
<b>Speckle</b> <input type="checkbox"/> Z <input type="checkbox"/> V			

Figure B-3: RHI TASK Configuration

SIGMET, rain TASK Configuration: VVP

**File Menus Commands Help**

Description For wind profiles, Oct 2001

**ANTENNA /RADAR CONTROL**

Scan Mode ☐ PPI Full ☐ Resolution  Pulse Width

Azimuth  Gain Control ☐ Fixed

Elevation  Polarization ☐ Horiz

Scan Speed

**PROCESSOR CONFIGURATION**

DSP Data ☐ Z ☐ V  Start Range  Vel Unfold

Samples  Bin Spacing  High PRF

Filter Dop  Range Avg  Low PRF

Filter Log  Max Range  Unamb Vel

Input Bins  Unamb Range  Major Mode ☐ FFT

Output Bins

**DATA CORRECTIONS**

Clutter Map ☐ Beam Blockage ☐ Attenuation ☐

Unfold VC ☐ Remove Fallspeed in VC ☐

**DATA QUALITY THRESHOLDING**

T ☐ LOG ☐ LOG ☐ SIG ☐ CSR ☐ SQI ☐ Defaults

Z ☐ LOG & CSR ☐ LOG ☐ SIG ☐ CSR ☐ SQI ☐ Defaults

V ☐ SQI & CSR ☐ LOG ☐ SIG ☐ CSR ☐ SQI ☐ Defaults

W ☐ SIG & SQI & LOG ☐ LOG ☐ SIG ☐ CSR ☐ SQI ☐ Defaults

ZDR ☐ All Fail ☐ LOG ☐ SIG ☐ CSR ☐ SQI ☐ Defaults

0.5dB 5 dB 10 dB 0.40

Speckle ☐ Z ☐ V

The MANUAL TASK is identical except that the scan mode is set to Manual.

## Step 2: Configure the MONITOR TASK Schedule

The TASK schedule for the MONITOR mode is shown in Figure B–4, set for a 15 minute cycle, as follows:

- PPI\_VOL, the primary TASK, is set to run on the even 15 minutes.
- SURVEILLANCE is set to run at 7 minutes after the hour and every 15 minutes thereafter. (When PPI\_VOL is run, the run time can be read from the Task scheduler and thus a suitable schedule can be selected.)
- RHI is set to be non-mandatory so that it will be interrupted by more important TASKS if the operator is running it during a scheduled time.
- RHI\_MANUAL is set to be non-mandatory as for RHI.

Figure B–4: MONITOR TASK Schedule

SIGMET, rain TASK Scheduler: MONITOR										
File Menus Commands Active										Help
ID	---Task---	--Command--	Scan	Rng	---Data---	Start	Stop	Repeat	RunTime	----Flags----
1	PPI_VOL	Scheduled	PPIF	240	Z V	00:00:00	**:*:*:	00:15:00	00:05:44	Mand
2	SURVEILLANCE	Scheduled	PPIF	300	Z	00:07:00	**:*:*:	00:15:00	00:00:27	Mand
3	VVP	Running	PPIF	60	Z V	00:11:00	**:*:*:	00:15:00	00:01:55	Mand
4	RHI	Idle	RHI	100	Z	00:00:00	**:*:*:	**:*:*:	**:*:*:	
5	MANUAL	Idle	MAN	100	Z	00:00:00	**:*:*:	**:*:*:	**:*:*:	

## Step 5: 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–5.



**Figure B–5: MONITOR Mode Radar Status Menu**

wind Radar Status: MONITOR			
File Menus Commands Mode			Help
<b>Control Section</b>			
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 type="checkbox"/> Stopped
Servo Power	<input checked="" type="checkbox"/> On	Messages	<input type="checkbox"/> 0
		Site Status	<input type="checkbox"/> SIG
		Product Output	<input checked="" type="checkbox"/> Idle
		R/T Display	<input checked="" type="checkbox"/> Idle
		Network Recvr	<input checked="" type="checkbox"/> Idle 1
		Mode Switch	<input checked="" type="checkbox"/>
<b>SUBSYSTEM STATUS</b>		<b>ANTENNA/TRANSMITTER STATUS</b>	
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.



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

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## Step 6: 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 the *IRIS Products Manual*).

## Step 7: 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.