

### 5.3.1 Stare coordinates

The stare coordinates are used by default whenever the LiDAR software is started and whenever no other scanning patterns are being used. If no other scanning is set, the LiDAR will continue to use the stare coordinates for data collection. A suitable staring position can be entered into the Az and El fields. **It is recommended that an Azimuth position is used to minimise the scanner pod being placed directly over the wiping brush.**

If the **wiping brush** becomes very distorted, it can be reshaped while wet, and dried straight. It can be removed by unscrewing two grub screws that can be accessed while pushing the top heat shield plate down *slightly*.

### 5.3.2 VAD scans.

Select scan	Rays /pnt	No. Points	Repeat (min)	~Duration (min)	
Stare	1				90 (Az) 90 (El)
VAD	1	8	60	0.2	60 Elev. angle
RHI	1	8	6	0	80 Start AZ
DBS	6	3	6	0	75 Elev. angle
Scan file 1	2	30	6	0	
Scan file 2	1	15	4	0	
Scan file 3	1	1	4	0	
Scan file 4	1	1	4	0	
Scan file 5	1	1	4	0	

Approximate total duration (min) 0.20 Finished

To add a VAD scanning routine to the current schedule, the VAD is button is pressed. The various options for the VAD scan are selected by altering the editable (yellow) boxes.

If the Finished button were pressed in the example above, the scan schedule would be set as follows:

- On main system start up, (for example the time is 09:50) data would be collected with the beam set to the vertical position until 10:50.
- At 10:50, a VAD scan would be performed consisting of 8 rays at 60 degrees elevation from horizontal with 45 degrees in azimuth between them. The first ray would be at 0 degrees in azimuth, the next at 45 degrees and so on.
- After the VAD scan is finished, (the time is now approximately 10:51), the system goes back to staring vertically until ~ 11:50.
- The repetition time is counted from the beginning of a scan file to the next beginning, and not from when a scan finishes. E.g. 10-minute repeats with a scan duration of 2 minutes will produce a scan every 10 minutes – not every 12 minutes.

### 5.3.3 RHI scans.

Select scan	Rays /pnt	No. Points	Repeat (min)	~Duration (min)	
Stare	1				90 (Az) 90 (El)
VAD <input checked="" type="checkbox"/>	1	8	60	0.2	60 Elev. angle
RHI <input checked="" type="checkbox"/>	1	18	120	0.45	90 Start AZ
DBS <input type="checkbox"/>	6	3	6	0	75 Elev. angle
Scan file 1 <input type="checkbox"/>	2	30	6	0	
Scan file 2 <input type="checkbox"/>	1	15	4	0	
Scan file 3 <input type="checkbox"/>	1	1	4	0	
Scan file 4 <input type="checkbox"/>	1	1	4	0	
Scan file 5 <input type="checkbox"/>	1	1	4	0	
Approximate total duration (min)				0.65	<b>Finished</b>

The input parameters for an RHI scan are similar to those of the VAD type. The starting azimuth will be the bearing of the first point at 0 degrees elevation. For the example above, the scanner will move to 10 degrees elevation for the next point, then to 20 degrees etc. finishing at 180 degrees elevation (or 0 degrees at 270 degrees azimuth equivalent). The RHI always starts and finishes at the horizontal orientation.

The RHI example above will repeat every 2 hours. As the VAD is set to repeat every hour, they will coincide every 3<sup>rd</sup> hour. In that situation, the VAD scan will execute, immediately followed by the RHI scan. As usual, the system will be orientated in the stare mode when no other scan types are in progress.

### 5.3.4 Wind profile.

Select scan	Rays /pnt	No. Points	Repeat (min)	~Duration (min)	
Stare	1				90 (Az) 90 (El)
VAD <input checked="" type="checkbox"/>	1	8	60	0.2	60 Elev. angle
RHI <input checked="" type="checkbox"/>	1	18	120	0.45	90 Start AZ
DBS <input checked="" type="checkbox"/>	2	3	20	0.15	60 Elev. angle
Scan file 1 <input checked="" type="checkbox"/>	2	30	6	0	
Scan file 2 <input checked="" type="checkbox"/>	1	15	4	0	
Scan file 3 <input checked="" type="checkbox"/>	1	1	4	0	
Scan file 4 <input checked="" type="checkbox"/>	1	1	4	0	
Scan file 5 <input checked="" type="checkbox"/>	1	1	4	0	
Approximate total duration (min)				0.80	<b>Finished</b>

The wind profile pattern emulates the RADAR wind profiler method of scanning 3 beams, one vertically pointing, one at a set elevation angle, to the North and another towards the East – **providing that the current bearing is set correctly.**

The options available for the wind profile scan are to set the elevation angle (from horizontal) and the number of rays averaged for each position.

### 5.3.5 User supplied scan file.

Select scan	Rays /pnt	No. Points	Repeat (min)	~Duration (min)	
Stare	1				90 (Az) 90 (El)
VAD <input type="checkbox"/>	1	8	60	0.2	60 Elev. angle
RHI <input type="checkbox"/>	1	18	120	0.45	90 Start AZ
DBS <input type="checkbox"/>	2	3	20	0.15	60 Elev. angle
Scan file 1 <input type="checkbox"/>	2	12	6	0.6	C:\Lider\System\test1.txt
Scan file 2 <input type="checkbox"/>	1	15	4	0	
Scan file 3 <input type="checkbox"/>	1	1	4	0	
Scan file 4 <input type="checkbox"/>	1	1	4	0	
Scan file 5 <input type="checkbox"/>	1	1	4	0	

Approximate total duration (min) **1.40** **Finished**

The scan file option is used to input a user generated scan pattern, which can consist of any number of coordinate pairs within the  $2\pi$  steradian field of regard.

After pressing any of the Scan file buttons, the filename to be used should be selected using the file browser pop-up. Once loaded, the approximate scan duration, number of points etc. will be displayed. The file that has been selected will not be over written by the schedule software, it merely creates a new file with appropriate headers for reading by the control software.