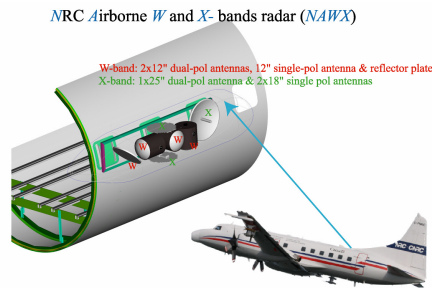


Appendix 1: NRC Airborne W and X-band polarimetric and Doppler radar

The NRC Airborne W and X-band (NAWX) radar will be integrated on the NRC Convair-580 aircraft by December 2005 and will be used during the Canadian CloudSat validation project flights (Jan-Apr 2006). The NAWX radar will have polarimetric and Doppler capabilities in both radar bands. The NAWX sub-systems include six 12"-25" antennas and a motorized reflector plate that are housed in a blister radome at the starboard side of the aircraft (see figure). This antenna configuration and the fast electronic switching allows near simultaneous measurements of vertical and horizontal cross-sections of radar polarimetric and Doppler data. The W-band radar has a liner FM chirp mode providing high sensitivity to detect weak cloud while the X-band radar will provide larger scale cloud structures. The main characteristics of the NAWX radar are listed in the following table.



NAWX specifications	X-band	W-band
RF output frequency	9.41 GHz +/- 30 MHz	94.05 GHz
Peak transmit power	25 kW magnetron split between two ports	1.7 kW typical
Transmit polarization	H and V	H or V
Maximum Pulse Repetition Rate	5 kHz	15 kHz
Transmitter max. duty cycle	0.1%	3 %
Pulse width	0.11-1 microseconds	0.1-10 microseconds (standard or linear FM chirped)
Antenna ports (electronically selectable)	4 (between two pairs)	5
Receiver cannel	2	2
Receiver polarization	Simultaneous H and V	Co and cross-polarization
Doppler	Pulse pair and FFT	Pulse pair and FFT
Transmitter Front-end Losses	1.5 dB typical	3.5 dB typical
Receiver front-end losses	1.5 dB typical	3.0 dB typical
LNA noise figure	2.8 dB typical	4.8 dB typical
IF output to digital receiver	60 MHz	54 MHz
Antennas	2 x 12" dual-polarization 1 x 12" single-polarization	1 x 25" dual-polarization 2 x 18" single-polarization
Minimum detectable @ 5 km	-30 dBZ (60 m resolution with 10x pulse compression)	-5 dBZ (150 m resolution)

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