

MARA - Moveable Atmospheric Radar for Antarctica
Technical Description

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MARA, at the Swedish / Finnish Antarctic station Wasa / Aboa, January 2007
(photo Hans Nilsson, IRF)

Table 1. Operations

Season	Operation dates
2006/2007	18, 19 Jan, 23 Jan – 5 Feb 2007
2007/2008	Planned 5 Dec 2007 – 1 Feb 2008

Table 2. Radar characteristics January / February 2007

Radar	MARA-Wasa
Operating frequency	54.5 MHz
Geographic coordinates	73.04° S 13.41° W
Height	470 m
Geomagnetic latitude	61.3 S
Geomagnetic midnight	01:10 LT
Galactic noise T_{sky}	1450 - 3500 K
Antenna feed factor L_T	0.75
Peak power	20 kW
Max. duty cycle	7.5 %
No. of receivers	3
Array effective area	540 m ² (divided into 3 subarrays)
Beam-width	12°
Manufacturer	Genesis Software PLC, Adelaide

Table 3. Radar operating modes January / February 2007 (continuous operation, alternating between the two modes, ca. 1 minute each mode).

Radar mode	fca_150	fca_4500
pulse length (3dB)	1 μ s	3.3 μ s
sampling resolution	150 m	600 m
code	none	8-bit complementary
coherent integrations	256 (54.6 ms)	32 (24.6 ms) per code
receiver filter (3 dB hw)	1000 kHz	250 kHz
pulse repetition frequency	4688 Hz	1300 Hz
duty cycle	0.5%	4.3 %
start height (aliased)	00.15 (32.15 , 64.15) km	4.80 km
stop height (aliased)	29.10 (61.10 , 93.10) km	105.00 km
receiver filter efficiency C_{filt}	0.91	0.87
PMSE detection threshold	$\sim 5 \times 10^{-15} \text{ m}^{-1}$ MARA	$\sim 2 \times 10^{-16} \text{ m}^{-1}$ MARA