RADARSAT C band SAR

[1] Reference: RADARSAT, R Keith Raney et al. 1991 IEEE

- (wavelength of 5.6 cm).
- Table 2
  - Frequency: 5.3 GHz
  - Pulse length: 42.0 us
  - Bandwidth: 11.6 or 17.3 or 30 MHz
    - Cross track resolution = $c/(2 * chirp\ bandwidth * cos(look\ angle))$ =
  - PRF: 1270 to 1390 Hz (2 Hz steps)
  - Peak power: 5 kW
  - Antenna size: 15m x 1.5m
    - Minimum azimuth resolution = 15m/2 = 7.5m
    - with 4 looks, azimuth res = 7.5*4 = 30m (close to reported 28m)
- Although the orbit repeat period is 24 days, with the 500-km wide swath substantially complete surface coverage is available after only four days, even at equatorial latitudes.
- Table 3, Standard mode
  - resolution 25 x 28 m
  - Looks = 4 (standard mode)
  - Swath width = 100 km
  - Incidence angle 20-49 deg
- Noise equivalent sigma0 (Design) < -23 dB, beam edge: -18.5 dB
- Signal quantization: 4 bits
- Nominal data rate capacity of these channels is 105 Mb/s, thus compatible with the ERS-1 system [20], although the rate required to support the specified swath width in most modes is less than 85 Mb/s.
- The elevation beams required to illuminate the standard 100 km swaths decrease in angular width as incidence angle increases. The antenna therefore has to be capable of providing a variety of different elevation beamwidths, as well as variable beam directions.
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[2] Reference:

https://directory.eoportal.org/web/eoportal/satellite-missions/s/seasat

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[3] Reference: Spaceborne SAR Study: LDRD '92 Final Report

- Look angle: 20 - 59 deg
- Noise temperature = 551 K = 4.62 dB Noise Figure
- prime DC power = 2500 W
- Electronics dimension = 80 x 60 x 60 cm3

***Determined specs** (highlight are "guessed-values"):*

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```
{
    "@type": "Synthetic Aperture Radar",
    "name": "RADARSAT1-Standard Mode",
    "mass":,
    "volume": ,
    "power": 2500,
    "orientation": {
        "convention": "SIDE_LOOK",
        "sideLookAngle": 20
    },
    "dataRate": 85,
    "pulseWidth": 42.6e-6,
    "antennaAlongTrackDim": 15,
    "antennaCrossTrackDim": 1.5,
    "antennaApertureEfficiency": ,
    "operatingFrequency": 5.3e9,
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    "peakTransmitPower": 5000,
    "chirpBandwidth": 30e6,
    "minimumPRF": 1270,
    "maximumPRF": 1390,
    "radarLosses": ,
    "sceneNoiseTemp": 290,
    "bitsPerPixel": 4,
    "systemNoiseFigure": 4.62,
    "sigmaNEZ0threshold": -18.5,
    "_comments": ["",
                  ""]

}
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