ERS1 C band SAR

highlight shows info to be input into instrument specs json file

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

- Table 4.1.1b
  - frequency: 5.25 GHz (0.0571 m wavelength)
  - Look angle: 20 deg
  - Azimuth res: 28 m
    - N looks = 4
  - Tx bandwidth = 15.5 MHz
    - Cross track resolution = c/(2 * *chirp bandwidth * cos(look angle)*) = 28.3 m (26m in reference)
  - typical sigma nez = -24
  - PRF: 1680 - 1700 Hz
  - Peak Tx power: 4800 W
  - Tx pulse width = 37.1 us
  - Antenna size = 10 x 1 m2
  - Antenna gain = 40 dBi
    - Effective aperture area = lamda^2 * *G/(4**pi) = 2.594854
    - Aperture efficiency = Effective aperture area/ Real area = 2.594854/ 10 = 0.26
  - SAR weight = 512 kg
  - Buffered data rate = 105 Mbits/s
  - prime DC power = 1800 W

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

-

```
{
    "@type": "Synthetic Aperture Radar",
    "name": "ERS1 C-Band",
    "mass": 512,
    "volume": 1,
```

```
    "power": 1800,
    "orientation": {
        "convention": "SIDE_LOOK",
        "sideLookAngle": 20
    },
    "dataRate": 105,
    "pulseWidth": 37.1e-6,
    "antennaAlongTrackDim": 10,
    "antennaCrossTrackDim": 1,
    "antennaApertureEfficiency": 0.26,
    "operatingFrequency": 5.25e9,
    "peakTransmitPower": 4800,
    "chirpBandwidth": 15.5e6,
    "minimumPRF": 1680,
    "maximumPRF": 1700,
    "radarLosses": 3.5,
    "sceneNoiseTemp": 290,
    "bitsPerPixel": 5,
    "systemNoiseFigure": 3.4,
    "sigmaNEZ0threshold": -15,
    "_comments": [""
                  ""]

}
```