



# Frequency ranges for 2/4 Gbps

Please enter here your receivers with their frequency ranges. It should help us to identify the best ranges for 4 Gbps observations, 2\*512 MHz (dual polarisation). Please keep this table up to date!

For each receiver please provide:

- Available bandwidth in MHz.
- Which IF output can your telescope provide? For example IF: 500-1000
- Total frequency range in GHz
- What limits on LO tunability do exist? Step size.
- Type of polarization
- IF inputs for scheduling (e.g. A, B, A1, C3, ...)
- normal or typical LO value(s).

| Telescope  |                     | L-band                  | C-band    | M-band | X-band    | K-band      | Q-band | V   |
|------------|---------------------|-------------------------|-----------|--------|-----------|-------------|--------|-----|
| Arecibo    | BW [MHz]            |                         |           |        |           |             |        |     |
|            | IF [MHz]            |                         |           |        |           |             |        |     |
|            | Freq. [GHz]         |                         |           |        |           |             |        |     |
|            | tunable [step size] |                         |           |        |           |             |        |     |
|            | pol.                |                         |           |        |           |             |        |     |
|            | IF input [RCP, LCP] |                         |           |        |           |             |        |     |
|            | typical LO          |                         |           |        |           |             |        |     |
| Badary     | BW [MHz]            | 340                     | 900       |        | 900       | 500         |        |     |
|            | IF [MHz]            |                         |           |        |           |             |        |     |
|            | Freq. [GHz]         | 1.38–1.72               | 4.60–5.50 |        | 8.18–9.08 | 22.02–22.52 |        |     |
|            | tunable [step size] |                         |           |        |           |             |        |     |
|            | pol.                | circ.                   | circ.     |        | circ.     | circ.       |        |     |
|            | IF input [RCP, LCP] |                         |           |        |           |             |        |     |
|            | typical LO          |                         |           |        |           |             |        |     |
| Effelsberg | BW [MHz]            | 140                     | 500       | 4000   | 920       | 4000        | 4000   | 20  |
|            | IF [MHz]            | 80-220                  | 500-1000  | 0-4000 | 0-920     | 0-4000      | 0-4000 | 0-2 |
|            | Freq. [GHz]         | 1.29-1.43,<br>1.58-1.73 | 4.6-5.1   | 4-9.3  | 7.9-9.0   | 18.0-26.0   | 33-50  | 84  |

|                                       |   |                                    |                  |             |                             |            |        |       |
|---------------------------------------|---|------------------------------------|------------------|-------------|-----------------------------|------------|--------|-------|
| efl                                   | some restrictions on LO size]                                 | 0 MHz because of 1 MHz boundaries! | 0 MHz            | 1 MHz       | 1 MHz                       | 1 MHz      | 1 MHz  | 1 MHz |
| hh1                                   | also S-band: 0.21 (2.21-2.45) and Ku-band: 0.40 (11.41-12.61) | circ.                              | circ.            | linear      | circ.                       | circ.      | circ.  | circ. |
| mh1                                   | also S-band: 0.14 (2.21-2.35) input [RCP, LCP]                | A2, C4                             | A1, C3           | A1, B3      | A3, C1 (geo A4, B4, C2, D2) | A3, C1     | A1, C3 | A1    |
| sr1                                   | also P-band: 85.005 - 0.390, 300                              |                                    |                  |             |                             |            |        |       |
| yl                                    | For more details see <a href="#">here</a>                     | typical LO 1490, 1510              | 4100             | 8000        | 5600 (geo 8110)             | 21500      | 42400  | 85000 |
|                                       | The old table is available <a href="#">here</a>               |                                    |                  |             |                             |            |        |       |
| <b>Hartebeest-hoek</b> <sup>hh1</sup> | BW [MHz]  | 160                                | 500              | 150         | 800                         | 1500       |        |       |
|                                       | IF [MHz]  | 0-300                              | 0-500            | 0-400       | 0-1000                      | 0-1500     |        |       |
|                                       | Freq. [GHz]   | 1.59-1.75                          | 4.6-5.1          | 5.9-6.9     | 8.18-8.98                   | 21.4-24.1  |        |       |
|                                       | tunable [step size]   | 1 kHz                              | no               | 1 kHz       | no                          | 1 kHz      |        |       |
|                                       | pol.  | circ.                              | circ.            | circ.       | circ.                       | circ.      |        |       |
|                                       | IF input [RCP, LCP]   | A1(B2), C1                         | A1(B2), C1       | A1 (B2), C1 | A1(B2), C1                  | A1(B2), C1 |        |       |
|                                       | typical LO  | 1510                               | 4600             | 6510        | 8080                        | 22000      |        |       |
| <b>Irbene</b>                         | BW [MHz]  | 200                                | 1000             | 1200        | 1200                        |            |        |       |
|                                       | IF [MHz]  | 200-400                            | 400-1400         | 300-1500    | 300-1500                    |            |        |       |
|                                       | Freq. [GHz]   | 1.4-1.6, 1.6-1.72                  | 4.5-5.5, 5.4-6.4 | 6.4-7.6     | 7.6-8.8                     |            |        |       |
|                                       | tunable [step size]   | 1 kHz                              | 1 MHz            | 1 MHz       | 1 MHz                       |            |        |       |
|                                       | pol.  | circ.                              |                  |             |                             |            |        |       |

|                |                     |            |            |          |      |            |  |  |
|----------------|---------------------|------------|------------|----------|------|------------|--|--|
|                | IF input [RCP, LCP] |            |            |          |      |            |  |  |
|                | typical LO          | 1200, 1350 | 4100, 5000 | 6100     | 7300 |            |  |  |
| <b>Jb-1</b>    | BW [MHz]            |            |            |          |      |            |  |  |
|                | IF [MHz]            |            |            |          |      |            |  |  |
|                | Freq. [GHz]         |            |            |          |      |            |  |  |
|                | tunable [step size] |            |            |          |      |            |  |  |
|                | pol.                |            |            |          |      |            |  |  |
|                | IF input [RCP, LCP] |            |            |          |      |            |  |  |
|                | typical LO          |            |            |          |      |            |  |  |
| <b>JB-2</b>    | BW [MHz]            | 500        | 500        | 500      |      | 500        |  |  |
|                | IF [MHz]            | 512-1024   | 512-1024   | 512-1024 |      | 512-1024   |  |  |
|                | Freq. [GHz]         | 1.25-1.75  | 4.0-7.5    | 4.0-7.5  |      | 20.0-25.02 |  |  |
|                | tunable [step size] | 1 Hz       | 1 Hz       | 1 Hz     |      | 1 Hz       |  |  |
|                | pol.                |            |            |          |      |            |  |  |
|                | IF input [RCP, LCP] |            |            |          |      |            |  |  |
|                | typical LO          |            |            |          |      |            |  |  |
| <b>Kunming</b> | BW [MHz]            |            | 442; 954   | 442; 954 | 800  |            |  |  |

|                 |                     |                          |                    |                    |           |           |  |  |
|-----------------|---------------------|--------------------------|--------------------|--------------------|-----------|-----------|--|--|
|                 | IF [MHz]            |                          | 70-512;<br>70-1024 | 70-512;<br>70-1024 | 100-900   |           |  |  |
|                 | Freq. [GHz]         |                          | 4.0-8.0            | 4.0-8.0            | 8.2-9.0   |           |  |  |
|                 | tunable [step size] |                          | yes, 1KHz          | yes, 1KHz          | no        |           |  |  |
|                 | pol.                |                          | circular           | circular           | circular  |           |  |  |
|                 | IF input [RCP, LCP] |                          |                    |                    |           |           |  |  |
|                 | typical LO          |                          | 4600               | 5900;6400          | 8100      |           |  |  |
| <b>Medicina</b> | BW [MHz]            | 100-130                  | 800                | 800                | 800       | 2000      |  |  |
|                 | IF [MHz]            | 290-430                  | 100-900            | 100-900            | 100-900   | 100-2100  |  |  |
|                 | Freq. [GHz]         | 1.35-1.45<br>1.585-1.715 | 4.3-5.8            | 5.9-7.3            | 8.18-8.98 | 18.0-26.5 |  |  |
|                 | tunable [step size] | 1Hz                      | 1Hz                | 1Hz                | no        | 1Hz       |  |  |
|                 | pol.                | circular                 | circular           | circular           | circular  | circular  |  |  |
|                 | IF input [RCP, LCP] | A1,C1                    | A1,C1              | A1,C1              | C1,A1     | A1,C1     |  |  |
|                 | typical LO          | 1036, 1295               | 4600               | 5800,6414          | 8080      | 21992     |  |  |
| <b>MERLIN</b>   | BW [MHz]            |                          |                    |                    |           |           |  |  |
|                 | IF [MHz]            |                          |                    |                    |           |           |  |  |
|                 | Freq. [GHz]         |                          |                    |                    |           |           |  |  |

|                  |                     |             |           |          |             |             |           |     |
|------------------|---------------------|-------------|-----------|----------|-------------|-------------|-----------|-----|
|                  | tunable [step size] |             |           |          |             |             |           |     |
|                  | pol.                |             |           |          |             |             |           |     |
|                  | IF input [RCP, LCP] |             |           |          |             |             |           |     |
|                  | typical LO          |             |           |          |             |             |           |     |
| <b>Metsähovi</b> | BW [MHz]            |             |           |          | 480         | 500         | 500       | 500 |
|                  | IF [MHz]            |             |           |          | 500-980     | 500-1000    | 500-1000  | 500 |
|                  | Freq. [GHz]         |             |           |          | 8.15-8.65   | 21.98-22.48 | 40.0-45.0 | 86  |
|                  | tunable [step size] |             |           |          | no          | no          | no        | no  |
|                  | pol.                |             |           |          |             |             |           |     |
|                  | IF input [RCP, LCP] |             |           |          |             |             |           |     |
|                  | typical LO          |             |           |          | 7650        | 21480       | 42400     | 85  |
| <b>Noto</b>      | BW [MHz]            |             | 400       | 400      | 800         | 500         |           |     |
|                  | IF [MHz]            | 37-466      | 100-500   | 100-500  | 1.116-1.916 |             |           |     |
|                  | Freq. [GHz]         | 1.316-1.745 | 4.62-5.02 | 5.1-7.25 | 8.205-8.938 | 21.7-22.2   |           |     |
|                  | tunable [step size] | no          | no        | yes      | no          | no          |           |     |
|                  | pol.                | circular    | circular  | circular | circular    | circular    |           |     |
|                  | IF input [RCP, LCP] |             |           |          |             |             |           |     |

|                               |                     |          |          |          |          |           |           |           |
|-------------------------------|---------------------|----------|----------|----------|----------|-----------|-----------|-----------|
|                               | typical LO          | 1279     |          |          |          |           |           |           |
| <b>Onsala</b>                 | BW [MHz]            | 500      | 500      | 500      | 1000     | 500       | 500       | 500       |
|                               | IF [MHz]            | 512-1024 | 512-1536 | 512-1536 | 10-1000  | 512-1024  | 512-1024  | 512-1024  |
|                               | Freq. [GHz]         | 1.2-1.75 | 4.5-7.0  | 4.5-7.0  | 8.1-9.1  | 18.0-26.0 | 36.0-50.0 | 36.0-50.0 |
|                               | tunable [step size] | 1 MHz    | 1 MHz    | 1 MHz    | no       | 1 MHz     | 1 MHz     | 1 MHz     |
|                               | pol.                | circular | circular | circular | circular | circular  | circular  | circular  |
|                               | IF input [RCP, LCP] | A1, C1   | A1,C1    | A1,C1    | A1,C1    | A1,C1     | A1,C1     | A1,C1     |
|                               | typical LO [MHz]    | 708      | 4088     | 5902     | 8080     | 21480     | 42300     | 42300     |
| <b>Robledo</b>                | BW [MHz]            | 500      |          |          | 500      | 70        | 70        | 70        |
|                               | IF [MHz]            | 20-520   |          |          | 50-550   |           |           |           |
|                               | Freq. [GHz]         | 1.3-1.8  |          |          |          | 18.0-26.5 | 39.0-49.0 | 39.0-49.0 |
|                               | tunable [step size] | yes      |          |          |          | yes       | yes       | yes       |
|                               | pol.                | only RCP |          |          |          |           |           |           |
|                               | IF input [RCP, LCP] |          |          |          |          |           |           |           |
|                               | typical LO          |          |          |          |          |           |           |           |
| <b>Sardinia<sup>sr1</sup></b> | BW [MHz]            | 500      | 1400     | 2000     |          | 2000      |           |           |
|                               | IF [MHz]            | 500-1000 | 100-1500 | 100-2100 |          | 100-2100  |           |           |

|                     |                     |  |            |             |         |             |  |  |
|---------------------|---------------------|--|------------|-------------|---------|-------------|--|--|
|                     | Freq. [GHz]         | 1.3-1.8                                | 4.2-5.6    | 5.6-7.6     |         | 17.9-25.9   |  |  |
|                     | tunable [step size] | yes (1 mHz in the range 2100-2400 MHz) | yes (10Hz) | yes (10 Hz) |         | yes (10 Hz) |  |  |
|                     | pol.                | linear, circular                       | circular   | circular    |         | circular    |  |  |
|                     | IF input [RCP, LCP] | A1, C1                                 | A1, C1     | A1, C1      |         | A1,C1       |  |  |
|                     | typical LO          | 2324                                   | 4600       | 6400        |         | 21964       |  |  |
| <b>Shanghai-25m</b> | BW [MHz]            | 320                                    | 450        | 850         | 800     |             |  |  |
|                     | IF [MHz]            | 600-920                                | 500-1000   | 75-925      | 100-700 |             |  |  |
|                     | Freq. [GHz]         | 1.38-1.7                               | 4.65-5.1   | 5.975-6825  | 8.2-9.0 |             |  |  |
|                     | tunable [step size] | no                                     | no         | no          | no      |             |  |  |
|                     | pol.                | circ.                                  | circ.      | circ.       | circ.   |             |  |  |
|                     | IF input [RCP, LCP] | A,B                                    | A,B        | A,B         | A,B     |             |  |  |
|                     | typical LO          | 2300                                   | 4200       | 5900        | 8100    |             |  |  |
| <b>Svetloe</b>      | BW [MHz]            | 340                                    | 900        |             | 900     | 500         |  |  |
|                     | IF [MHz]            |  |            |             |         |             |  |  |



|              |                     |           |                         |           |                            |             |             |       |
|--------------|---------------------|-----------|-------------------------|-----------|----------------------------|-------------|-------------|-------|
|              | tunable [step size] | no        | yes,1MHz                | yes, 1MHz | no                         | yes, 1MHz   | yes, 1MHz   |       |
|              | pol.                | linear.   | circ.                   | circ.     | circ.                      | circ.       | circ.       |       |
|              | IF input [RCP, LCP] | A4,B3     | A4,B3                   | A4,B3     | A2,B1<br>(geo A2,B2,C4,D4) | A4,B3       | A4,B3       |       |
|              | typical LO          | 2270      | 4200                    | 5900      | 8100                       | 21580       | 42000       |       |
| <b>Torun</b> | BW [MHz]            | 500       | 500                     | 500       |                            | 500         |             |       |
|              | IF [MHz]            |           |                         |           |                            |             |             |       |
|              | Freq. [GHz]         | 1.30-1.72 | 4.35-4.95,<br>4.75-5.35 | 5.9-6.4   |                            | 20.0-25.0   |             |       |
|              | tunable [step size] | 1 kHz     | 1 kHz                   | 1 kHz     |                            | 1 kHz       |             |       |
|              | pol.                |           |                         |           |                            |             |             |       |
|              | IF input [RCP, LCP] |           |                         |           |                            |             |             |       |
|              | typical LO          |           |                         |           |                            |             |             |       |
| <b>Ulsan</b> | BW [MHz]            |           |                         |           |                            | 8000        | 8000        | 8000  |
|              | IF [MHz]            |           |                         |           |                            | 8000-16000  | 8000-10000  | 8000  |
|              | Freq. [GHz]         |           |                         |           |                            | 18.0 - 26.0 | 42.11-44.11 | 85.0  |
|              | tunable [step size] |           |                         |           |                            | 1 kHz       | 1 kHz       | 1 kHz |
|              | pol.                |           |                         |           |                            |             |             |       |
|              | IF input            |           |                         |           |                            |             |             |       |

|                   |                     |                 |                   |                   |                   |             |             |          |
|-------------------|---------------------|-----------------|-------------------|-------------------|-------------------|-------------|-------------|----------|
|                   | [RCP, LCP]          |                 |                   |                   |                   |             |             |          |
|                   | typical LO          |                 |                   |                   |                   |             |             |          |
| <b>Urumqi</b>     | BW [MHz]            | 500 (upgrading) | 954               |                   | 900               | 500         | 954         |          |
|                   | IF [MHz]            | 100-600         | 70-1024           |                   | 100-1000          | 100-600     | 70-1024     |          |
|                   | Freq. [GHz]         | 1.2-1.7         | 4-8               |                   | 8.2-9.1           | 22.0-24.2   | 30-50       |          |
|                   | tunable [step size] | no              | 1MHz              |                   | no                | 1KHz        | 1MHz        |          |
|                   | pol.                | circ.           | circ.             |                   | circ.             | circ.       | circ.       |          |
|                   | IF input [RCP, LCP] |                 |                   |                   |                   |             |             |          |
|                   | typical LO          | 1100            | 3930-6976         |                   | 8100              | 21900-23600 | 29930-48976 |          |
| <b>Westerbork</b> | BW [MHz]            | 160             |                   |                   |                   |             |             |          |
|                   | IF [MHz]            |                 |                   |                   |                   |             |             |          |
|                   | Freq. [GHz]         | 1.15-1.75       |                   |                   |                   |             |             |          |
|                   | tunable [step size] | yes             |                   |                   |                   |             |             |          |
|                   | pol.                |                 |                   |                   |                   |             |             |          |
|                   | IF input [RCP, LCP] |                 |                   |                   |                   |             |             |          |
|                   | typical LO          |                 |                   |                   |                   |             |             |          |
| <b>Yebees</b>     | BW [MHz]            |                 | 500 / 4000        | 500 / 4000        | 500 / 4000        | 1000        | 2000        | 5000     |
|                   | IF [MHz]            |                 | 500-1000 / 0-4000 | 500-1000 / 0-4000 | 500-1000 / 0-4000 | 0-1000      | 100-2100    | 500-1000 |

|                       |                     |           |           |          |           |             |   |              |
|-----------------------|---------------------|-----------|-----------|----------|-----------|-------------|---|--------------|
|                       | Freq. [GHz]         |           | 4.5-9.0   | 4.5-9.0  | 4.5-9.0   | 21.0-24.0   | 32.0-50.0                               | 81           |
|                       | tunable [step size] |           | 1 Hz      | 1 Hz     | 1 HzU     | yes         | yes                                     | yes          |
|                       | pol.                |           | circular  | circular | circular  | circular    | linear (+circular in the range [42-44]) | lin (+ in [8 |
|                       | IF input [RCP, LCP] |           | A1,C1     | A1,C1    | A1,C1     | A4,C4       | A3,C3                                   | A1           |
|                       | typical LO          |           |           |          |           |             |   |              |
| <b>Yonsei</b>         | BW [MHz]            |           |           |          |           | 8000        | 8000                                    | 80           |
|                       | IF [MHz]            |           |           |          |           | 8000-16000  | 8000-16000                              | 80           |
|                       | Freq. [GHz]         |           |           |          |           | 18.0-26.0   | 35.0-50.0                               | 85           |
|                       | tunable [step size] |           |           |          |           | 1 kHz       | 1 kHz                                   | 1 k          |
|                       | pol.                |           |           |          |           |             |   |              |
|                       | IF input [RCP, LCP] |           |           |          |           |             |   |              |
|                       | typical LO          |           |           |          |           |             |   |              |
| <b>Zelenchukskaya</b> | BW [MHz]            | 340       | 900       |          | 900       | 500         |   |              |
|                       | IF [MHz]            |           |           |          |           |             |   |              |
|                       | Freq. [GHz]         | 1.38–1.72 | 4.60–5.50 |          | 8.18–9.08 | 22.02–22.52 |   |              |
|                       | tunable [step size] |           |           |          |           |             |   |              |

|             |                     |           |                           |                           |                           |                           |                           |                           |
|-------------|---------------------|-----------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
|             | pol.                | circ.     | circ.                     |                           | circ.                     | circ.                     |                           |                           |
|             | IF input [RCP, LCP] |           |                           |                           |                           |                           |                           |                           |
|             | typical LO          |           |                           |                           |                           |                           |                           |                           |
| <b>VLBA</b> | BW [MHz]            | 500       | 500                       | 500                       | 500                       | 500                       | 500                       | 500                       |
|             | IF [MHz]            | 500-1000  | 500-1000                  | 500-1000                  | 500-1000                  | 500-1000                  | 500-1000                  | 500-1000                  |
|             | Freq. [GHz]         | 1.18-1.85 | 4.0-8.0                   | 4.0-8.0                   | 7.7-9.05                  | 20.5-25.3                 | 37.6-46.2                 | 86-100                    |
|             | tunable [step size] | 100 MHz   | 200-300 MHz <sup>v1</sup> |
|             | pol.                | circ.     | circ.                     | circ.                     | circ.                     | circ.                     | circ.                     | circ.                     |
|             | IF input [RCP, LCP] |           |                           |                           |                           |                           |                           |                           |
|             | typical LO          |           |                           |                           |                           |                           |                           |                           |