# 4.5cm broad band C/X secondary focus receiver (4000-9300 MHz)

This is a broad-band receiver with two orthogonal linear polarizations (at a 45°-angle with the horizon). The receiver (in most setups simultaneously) delivers 4 basebands (each with two polarizations):

| Baseband | Center Frequency | Bandwidth | Comment |
|---|---|---|---|
| 1 | 5.250 GHz | 2500 MHz | beware of strong RFI at frequencies < 4.5 GHz! |
| 2 | 6.750 GHz | 2500 MHz | |
| 3 | 6.668 GHz | 200 MHz | for methanol observations |
| 4 | 4.829 GHz | 200 MHz | for formaldehyde observations |

## Calibration Information

| Frequency [GHz] | Channel | Polarisation | Tcal [K] | Tsys [K] | Sensitivity [K/Jy] | SEFD [Jy] | Aperture Eff. [%] | TMB/S [K/Jy] | Main Beam Eff. [%] | HPBW [arcsec] | Last update |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5.250 | 1+2 | lin | 3.1 | 35 | 1.60 | 22 | 56 | 2.0 | 71 | 140 | Oct 2019 |
| 6.750 | 1+2 | lin | 4.5 | 37 | 1.40 | 26 | 49 | 1.6 | 58 | 105 | Oct 2019 |
| 6.668 | 1+2 | lin | 3.6 | 34 | 1.39 | 24 | 49 | 1.7 | 60 | 109 | Oct 2019 |
| 4.829 | 1+2 | lin | 2.8 | 42 | 1.59 | 26 | 56 | 1.8 | 65 | 146 | Oct 2019 |

| normalized Gain curve (G = A0 + A1·Elv + A2·Elv2) | | | Observed in | confirmed |
|---|---|---|---|---|
| A0 = 0.9928 | A1 = 4.212E-4 | A2 = -6.158E-6 | Jun 2016 | Oct 2019 |

**Comments:**

- The gain curve was corrected for opacity (though it is small, < 0.02 throughout the band).

## Version description for OBSINP

## Channel assignment in the MBFITS data files

## Spectroscopy modes and resolution

| Baseband | f_center | Bandwidth | N_Chan | Df | Dv | dv |
|---|---|---|---|---|---|---|
| | GHZ | MHz | | kHz | km/s | km/s |
| 1 | 5.25 | 2500 | 65536 | 38.1 | 2.18 | 2.53 |
| 2 | 6.75 | 2500 | 65536 | 38.1 | 1.69 | 1.96 |
| 3 | 6.668 | 200 | 65536 | 3.05 | 0.137 | 0.159 |
| 4 | 4.829 | 200 | 65536 | 3.05 | 0.189 | 0.219 |

N_Chan ... number of spectral channels

f_center ... center frequency

Df ... Channel separation (in frequency)

Dv ... Channel separation (in velocity)

dv ... Velocity resolution (dv=1.16*Dv)

## Tcal and Tsys measurements

From:

https://eff100mwiki.mpifr-bonn.mpg.de/ - **Effelsberg 100m Teleskop**

Permanent link:

**https://eff100mwiki.mpifr-bonn.mpg.de/doku.php?id=information_for_astronomers:rx:s45mm&rev=1601360239**

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