

# 1.0cm primary focus receiver (26500-36700 MHz)

This receiver was build for spectroscopic observations. It has a linearly polarized feed.

## Calibration Information

| Frequency [GHz]                                                    | Channel | Polarisation | Tcal [K] | Tsys [K]      | Sensitivity [K/Jy] | SEFD [Jy] | Aperture Eff. [%] | TMB/S [K/Jy] | Main Beam Eff. [%] | FWHM [arcsec] | Last update |
|--------------------------------------------------------------------|---------|--------------|----------|---------------|--------------------|-----------|-------------------|--------------|--------------------|---------------|-------------|
| 27.0                                                               | A       | linear       | 7.2      | 68            | 0.94               | 71        | 34                | 1.8          | 54                 | 30.5          | Mar 2010    |
| 30.0                                                               | A       | linear       | 8.0      | 70            | 0.85               | 82        | 31                | 1.6          | 53                 | 29.0          | Mar 2010    |
| 34.0                                                               | A       | linear       | 12.0     | 75            | 0.86               | 86        | 30                | 1.5          | 61                 | 25.0          | Mar 2010    |
| 36.3                                                               | A       | linear       | 12.5     | 79            | 0.85               | 93        | 30                | 1.8          | 48                 | 23.0          | Aug 2007    |
| normalized Gain curve ( $G = A0 + A1 \cdot Elv + A2 \cdot Elv^2$ ) |         |              |          |               |                    |           | Observed in       | confirmed    |                    |               |             |
| A0=0.81500                                                         |         | A1=1.0624E-2 |          | A2=-1.5237E-4 |                    | Aug 2007  |                   |              |                    |               |             |

## Comments:

- Typical zenith opacities range from 0.05 to 0.2 depending on the sky frequency and weather conditions.

## Version description for OBSINP

| RX Name                                     | Wavelength [cm]                                | Frequency (center) [GHz] | Nr. of Horns |
|---------------------------------------------|------------------------------------------------|--------------------------|--------------|
| <b>P10mm 4-Box (26,5-36,7 GHz)</b>          | 1.0                                            | 26.5-36.7                | 1            |
| <b>Version:</b>                             | <b>Comment</b>                                 |                          |              |
| 1. Cont./Line: 26,5-29,1 GHz (BW: 500 MHz)  | Continuum and spectroscopy 1st freq. range     |                          |              |
| 2. Cont./Line: 28,52-32,7 GHz (BW: 500 MHz) | Continuum and spectroscopy 2nd freq. range     |                          |              |
| 3. Cont./Line: 32,3-36,7 GHz (BW: 500 MHz)  | Continuum and spectroscopy 3rd freq. range     |                          |              |
| 4. Pulsar (BW: 500 MHz)                     | Pulsar version 1st freq. range (26.5-29.1 GHz) |                          |              |
| <b>Horn offsets [arcsec]</b>                | -972.8, 1086.6                                 |                          |              |

## Channel assignment in the MBFITS data files

Note that the narrow line and VLBA IF channels are usually only available when the specific line version of the receiver was selected. In addition for most receivers with narrow line channels the cables at the patch board need to be connected by the receiver group.

To select different channel numbers in OBSINP, the online plot, or the toolbox the numbers have to be specified like c(1)+c(2) to add channel 1 and 2. E.g. channel 1 and 2 contain the LCP and RCP broadband channels, then "OnlPlot pen='c(1)+c(2)'" or "toolbox use='c(1)+c(2)'" will select these channels. In OBSINP the pen can be directly specified in the receiver selection menu.

Abbreviations:

SB: narrow band channel (Schmalband-Kanal), 100 MHz band width

BB: digital broad band channel (Breitband-Kanal), band width varies for different receivers

VLBA: VLBA IF, 500 MHz band width

BW: band width

TP: total power

| <b>1.0cm PFK (Multi-RX-Box I)</b> |           |             |                |
|-----------------------------------|-----------|-------------|----------------|
| <b>Channel</b>                    | <b>IF</b> | <b>Pol.</b> | <b>Comment</b> |
| 1                                 | BB        | linear      | TP A           |
| 2                                 | VLBA      | linear      | TP A           |

## Spectroscopy modes and resolution

| <b>BW</b>  | <b>nchan</b> | <b>nu</b>  | <b>Df</b>  | <b>Dv</b>   | <b>dv</b>   |
|------------|--------------|------------|------------|-------------|-------------|
| <b>MHz</b> |              | <b>MHz</b> | <b>kHz</b> | <b>km/s</b> | <b>km/s</b> |
| 100        | 32768        | 27000      | 3.1        | 0.034       | 0.039       |
| 100        | 32768        | 29000      | 3.1        | 0.032       | 0.037       |
| 100        | 32768        | 31000      | 3.1        | 0.030       | 0.034       |
| 100        | 32768        | 33000      | 3.1        | 0.028       | 0.032       |
| 100        | 32768        | 35000      | 3.1        | 0.026       | 0.030       |
| 100        | 32768        | 37000      | 3.1        | 0.025       | 0.029       |
| 500        | 32768        | 27000      | 15.3       | 0.169       | 0.197       |
| 500        | 32768        | 29000      | 15.3       | 0.158       | 0.183       |
| 500        | 32768        | 31000      | 15.3       | 0.148       | 0.171       |
| 500        | 32768        | 33000      | 15.3       | 0.139       | 0.161       |
| 500        | 32768        | 35000      | 15.3       | 0.131       | 0.152       |
| 500        | 32768        | 37000      | 15.3       | 0.124       | 0.143       |

## Tcal and Tsys measurements

From:  
<https://eff100mwiki.mpifr-bonn.mpg.de/> - Effelsberg 100m Teleskop

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