DBBC Status Report

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Systems under construction

The Wettzell system with 4 IFs and 14 equivalent base band converters has been delivered in the end of October. The integration in the station will be shortly realised with the use of a MK5B+. At that point a class of observations will be realised.
The Irbene system is almost complete and it is expected to be delivered in the end of November. This unit is a basic one with 2 IFs and 2 Core1 boards, so to allow the station to perform the first observations and tests of the antenna and the 6 cm receiver. At a later stage additional Core1 boards will be added in order to get a complete system.
A system similar to the Irbene one is going to be delivered to the Arcetri Observatory. Main purpose is to use it as a development system for additional FPGA configurations devoted to the realization of spectrometer, pulsar, total power, polarimetry back-end.
The two systems for Tigo and O'Higgins will be equipped with Core2 boards, so they are expected to be delivered in December07-January08. The systems are at an advance stage in all the other parts.
Two additional complete systems are under initial stage of construction for Medicina and SRT, and in particular the Medicina unit is expected to support the multibeam 22GHz receiver (7 feeds x 2 polarization x 2 GHz bwd/ea) for VLBI and single dish applications.

DBBC.2

The first ADB2 board prototype has been completed and will be available for the first test in the end of November. The board offers several operation modes with demultiplexing in two or four bus fashion. The maximum sampling clock is 2.2 GHz, maximum signal frequency to be sampled is 3.5 GHz, 10-bit representation. A board ADB2 can feed as piggy-back element a FiLa10G, giving the possibility to place in the receiver site the sampling element, connecting throw optical fibres the DBBC processing elements.

The Core2 board in the V5 version is expected in the end of November for the first tests. The board is compatible with ADB1 and ADB2 and support a minimal equivalent of four Core1 functionality. A piggy-back element can be adopted for additional functionality, like a memory bank for pulsar dedispersion or other needs where an significant memory addition is to be adopted. Such memory populated piggy-back board is in development. Additional piggy-back elements are expected for ancillary functionalities.

The FiLa10G boards realization started and the first prototype of the board is expected in two-three months. This element can be used as piggy-back board of any ADB2 sampler, giving the possibility to transmit and receive in the same time an high data rate of 20 Gbps + 20 Gbps. Such bidirectional functionality can be required for instance when a RFI mitigation is needed to be realised in a remote position with respect to the sampling and processing site. With the typical sampling frequency of 2.048 MHz and the full 10-bit data representation, a double optical fibre set can meet the requirement. Indeed two transceivers are expected to be used, with the possibility to populate the board even with one transceiver only.

The same board can even support the data tx-rx of 2x2 VSI connections, and in such case it can still be used as p-b element of a ADB2 or as stand alone element. Indeed the configuration files can be also loaded by an on board flash memory.
The entire triangle connectivity HSI/HSIR --- VSI in/VSI out --- Optical Fibres is supported.

Observation, Documentation and more

The Europe89 was observed for 12 hours in September using 8 bbc equivalent in X band and 3 bbc equivalent in S band. Fringes have been detected in all the sub-bands. An important element was found related to the flatness of the receiver band. In the digital system use it would be required to optimize as much as possible such behaviour. In the specific situation of the Noto SX receiver, the band presents a slope between the lowest and the highest frequency of more than 30 dB. A correction is then in this case required and it can be afforded with two methods: a) adopting a specific opposite slope equalization filter, b) placing the sampler in the receiver site and using the optical fibre for transferring the received band in the 100 m path. The best approach will be evaluated.
Additional observation test will be realised with the Wz unit and all the other terminals that will be available in the time.

Dedicated web pages have been added in the Noto Internet server with information about the DBBC system. A document series is in preparation and it started to be available in these pages, so as a page with News.

The integration with the Field System is now mandatory and we feel as it could be realised in short time with a limited effort, due to the software structure adopted for the commands the DBBC is able to recognize. The gain information in the different part of the instrument are recorded in a log and can be available in the same time under a specific FS command request.