

## **FP7- Grant Agreement no. 283393 – *RadioNet3***

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### **Deliverable 8.10**

Conclusion of pre-production effort

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NEDERLAND (ASTRON), The Netherlands

## 1 Document information

Document name: UniBoard<sup>2</sup> – Conclusion of pre-production effort  
 Type: Prototype – Report  
 WP: 8 (UniBoard<sup>2</sup>)  
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### 1.1 Dissemination Level

Dissemination Level		
<b>PU</b>	Public	
<b>PP</b>	Restricted to other programme participants (including the Commission Services)	
<b>RE</b>	Restricted to a group specified by the consortium (including the Commission Services)	X
<b>CO</b>	Confidential, only for members of the consortium (including the Commission Services)	

### 1.2 Content

1	Document information .....	2
1.1	Dissemination Level .....	2
1.2	Content .....	2
2	Introduction .....	3
3	Photographic record.....	4

## 2 Introduction

The UniBoard<sup>2</sup> project set out to create a powerful, generic, FPGA-based computing platform for radio astronomy. The project timeline straddled several generations of FPGAs. At the onset, 28nm devices were available, but that would have meant creating a board that would be outdated by the time it was produced. After putting the hardware development on hold for one year, it became clear that 20nm Altera devices would become available within the time frame of the project. Not only that, they would be pin-compatible with the next generation of 14nm devices, produced in a collaboration of Altera and Intel.

The original title of this deliverable was “Production hardware”. As, during the project, the delivery of the FPGAs was delayed several times by the manufacturer, the risk existed that the boards themselves would only be assembled and delivered after the formal end of the project, 31 December 2015. This would mean that although all the actual work had been done by the project partners, the deliverable would not be delivered in time. The re-wording was to prevent such a situation, by de-coupling the final work done by the assembly company from the in-house effort.

In the end, it was all moot, as the boards were produced on time and delivered in Dwingeloo during the second week of December 2015. Note that the FPGAs on the production board are still 20nm Engineering Samples, albeit of the last generation. But this board can be equipped with 14nm Stratix10 FPGAs, when they become available in early 2017, and with that, it is truly built for the future.

This report is a photographic record of the production run, and the start of tests at the lab in Dwingeloo.

### 3 Photographic record

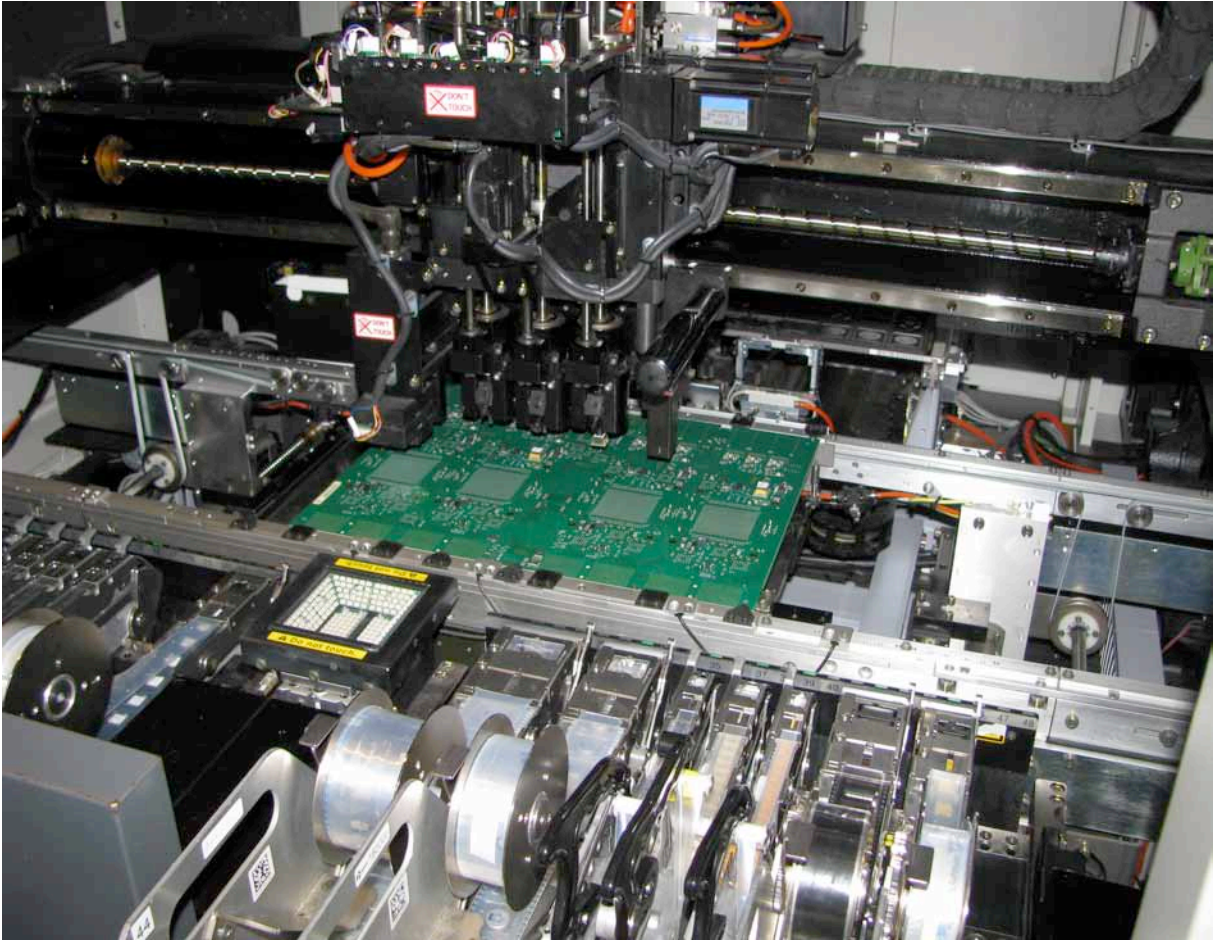
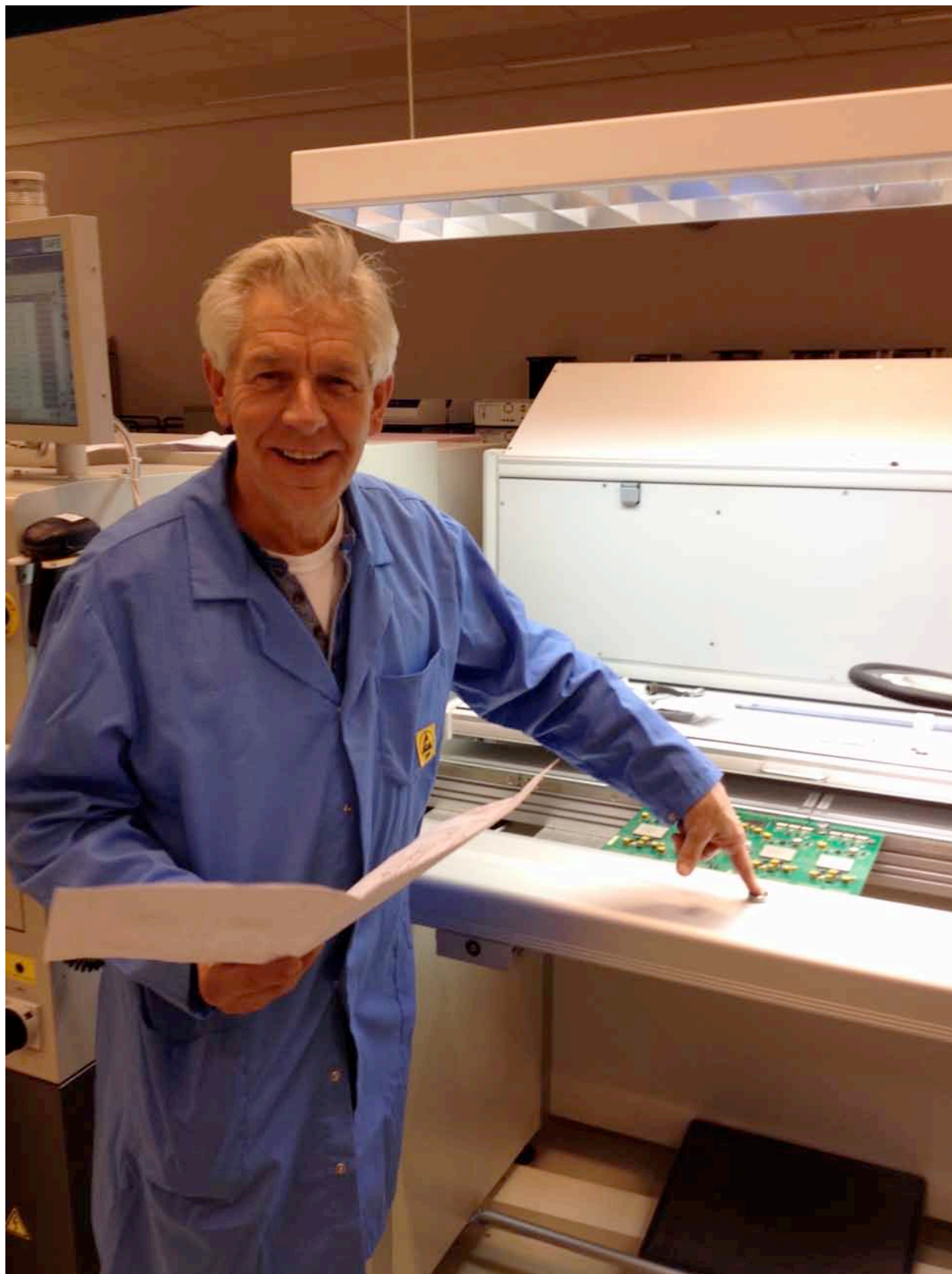


Figure 1: first board in pick and place machine



*Figure 2: ASTRON hardware engineer Sjouke Zwier is about to start the soldering*

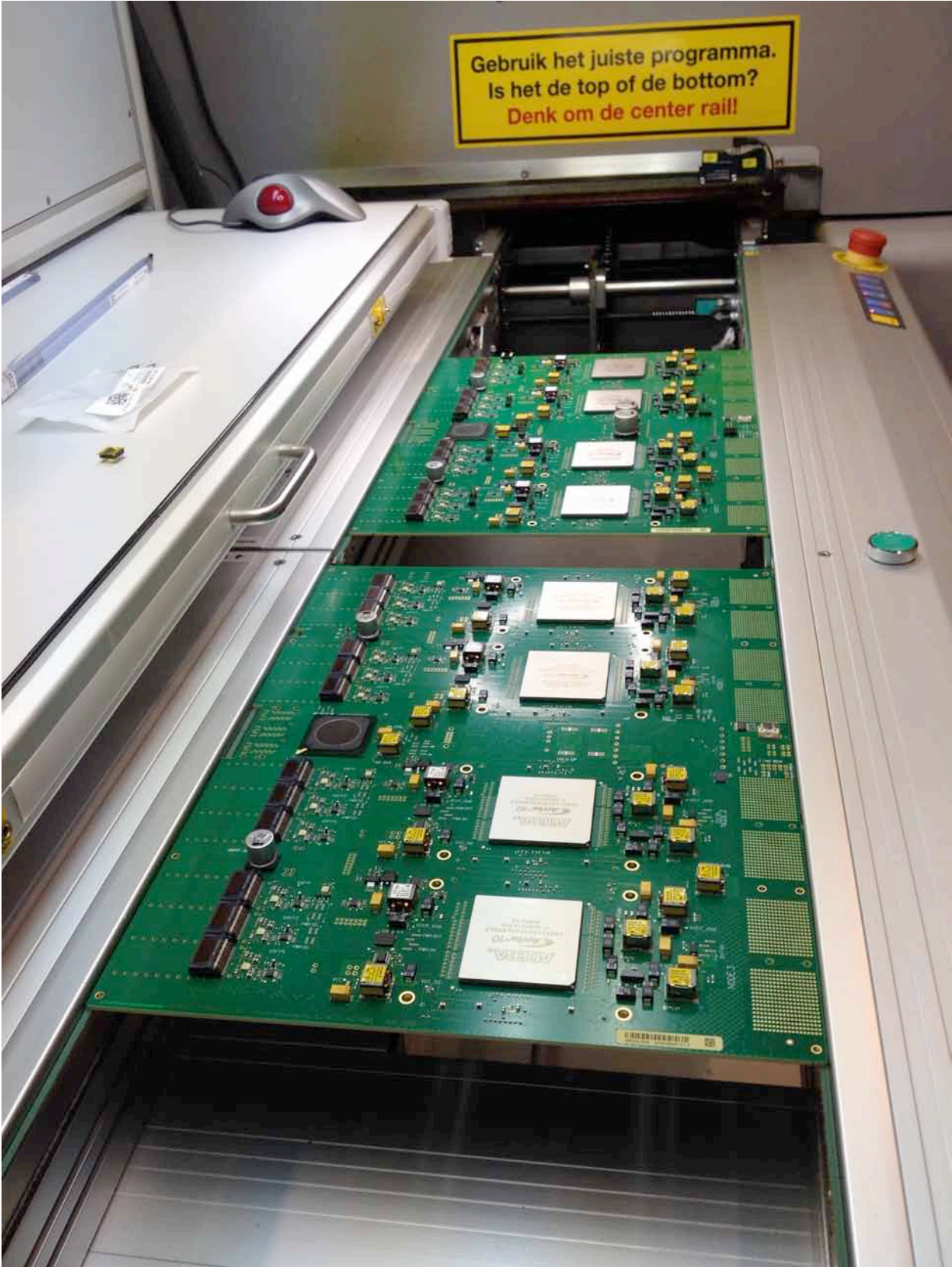
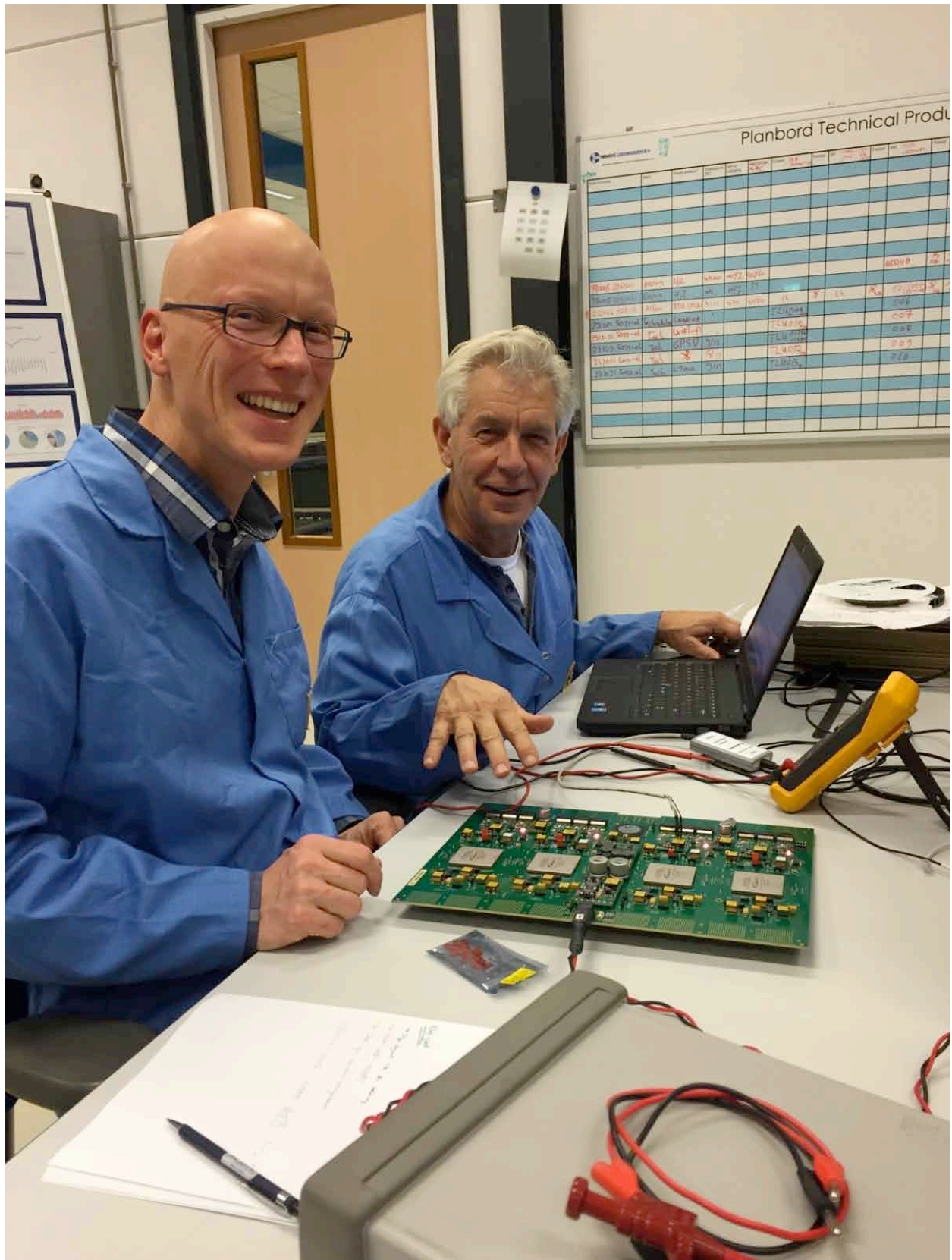
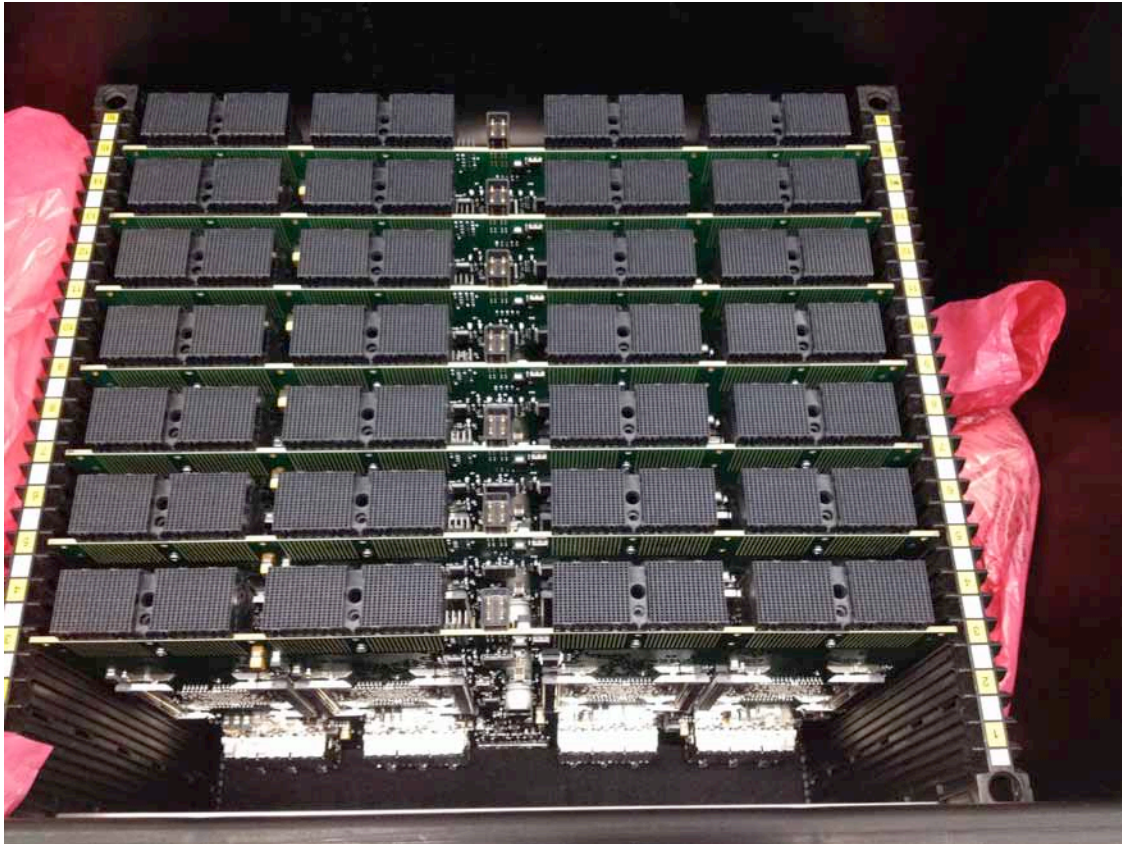


Figure 3: multiple boards on their way to soldering



*Figure 4: ASTRON chief designer Gijs Schoonderbeek and hardware engineer Sjouke Zwier doing first tests*



*Figure 5: crate with 7 boards upon arrival at Dwingeloo*





Figure 6: first board unpacked

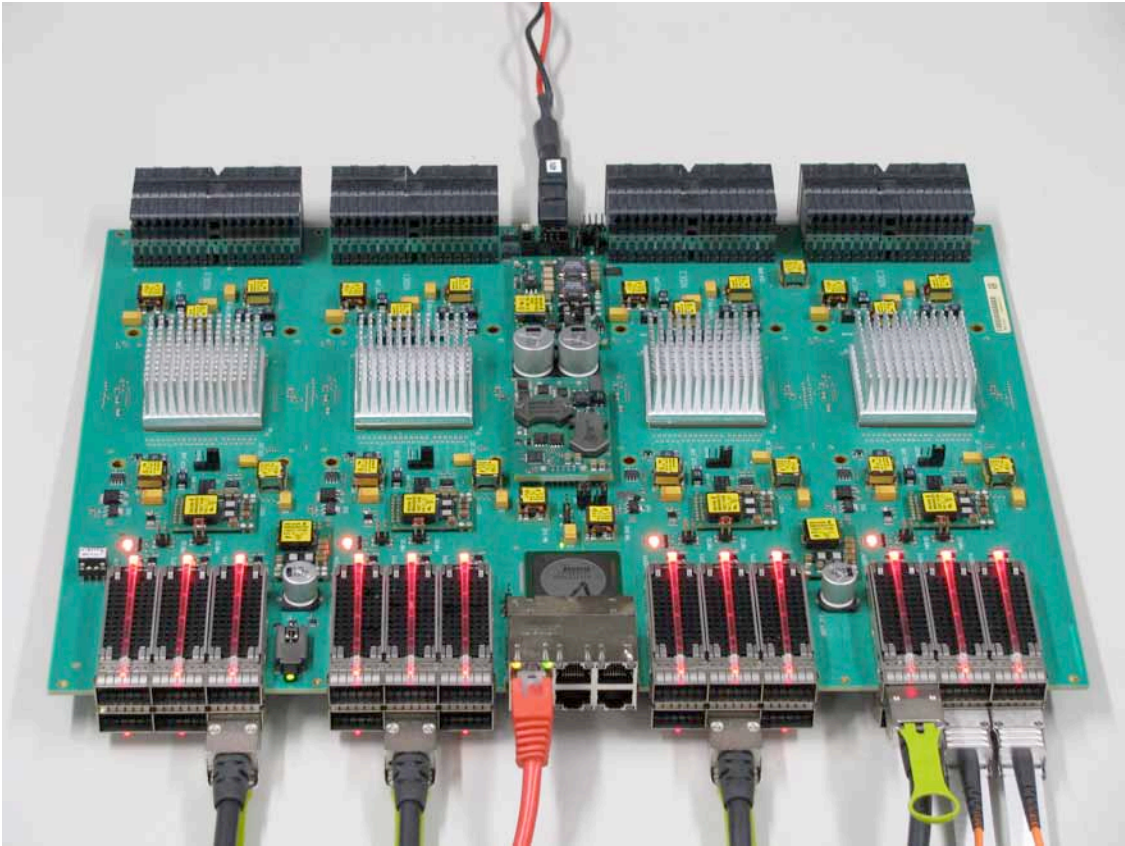


Figure 7: first board powered up and connected



Figure 8: UniBoard2 + backplane test board in enclosure

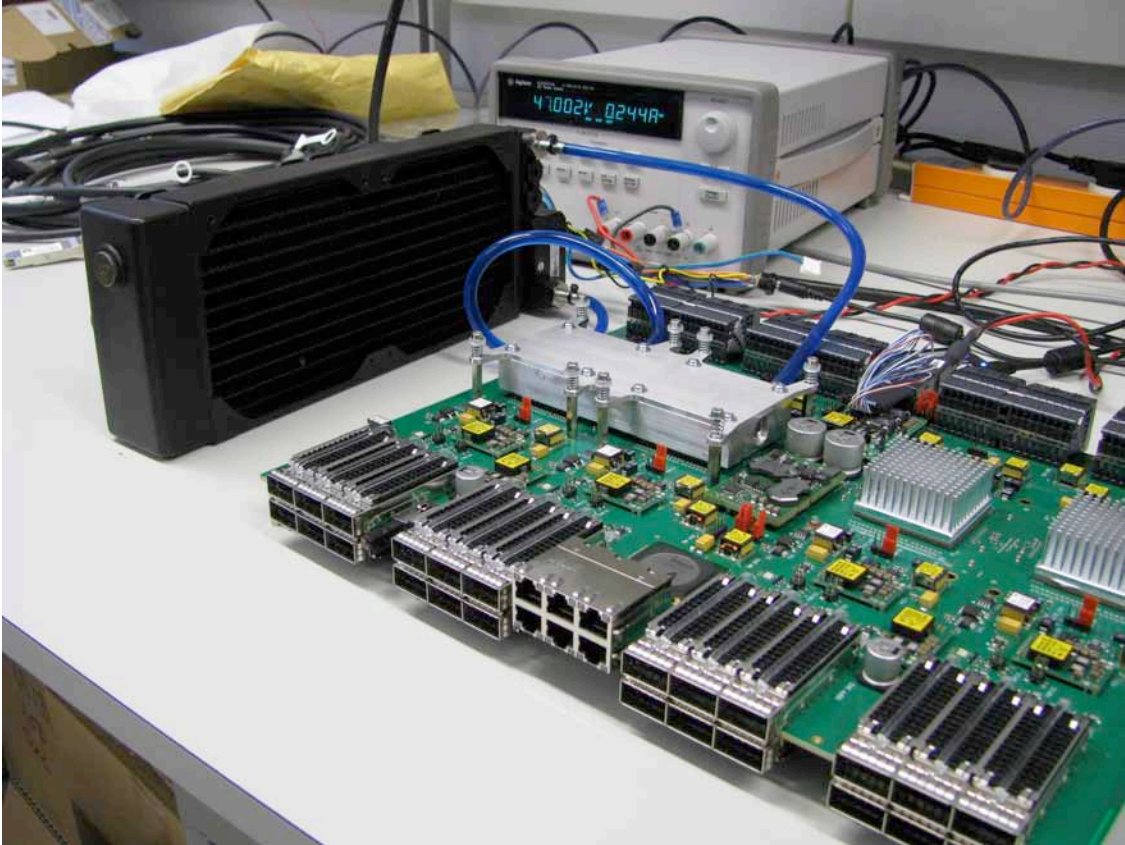


Figure 9: UniBoard2 with water cooling installed on two of the FPGAs



*Figure 10: UniBoard2 in display case during celebration of successful completion of production p*

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