

# The WRE IBM 7090/94

## General

The IBM 7090 was a second-generation transistorized version of the earlier IBM 709 vacuum tube mainframe computers and was designed for "large-scale scientific and technological applications". The 7090 was the third member of the IBM 700/7000 series scientific computers. The first 7090 installation was in November 1959. In 1960, a typical system sold for US\$2,900,000 or could be rented for \$63,500 a month.

An upgraded version, the IBM 7094, was first installed in September 1962.

## Architecture

The 7090 used a 36-bit word length, with an address-space of 32K (32,768) words. It operated with a basic memory cycle of 2.18  $\mu$ s, using the IBM 7302 Core Storage core memory technology.

The 7094 had seven index registers, instead of three on the earlier machines, it introduced double-precision floating point and additional instructions, but was largely backward compatible with the 7090. The console had a distinctive box on top that displayed lights for the four new index registers.

## Input/Output

The 7090 series featured a data channel architecture for input and output, a forerunner of modern direct memory access I/O. Up to 8 data channels could be attached, with up to 10 IBM 729 tape drives attached to each channel. Tape (and later, disk) storage offered high performance for the time. Printing and punched card I/O, however, employed modified unit record equipment and was slow. It became common to use a less expensive IBM 1401 computer to read cards onto magnetic tape for transfer to the 7090/94. Output would be spooled onto tape and transferred to the 1401 for printing or card punching using its much faster peripherals.



7090 console (not WRE)

General references: [http://en.wikipedia.org/wiki/IBM\\_7090](http://en.wikipedia.org/wiki/IBM_7090)  
<http://www.frobenius.com/7090.htm>  
[http://www-03.ibm.com/ibm/history/exhibits/mainframe/mainframe\\_PP7090.html](http://www-03.ibm.com/ibm/history/exhibits/mainframe/mainframe_PP7090.html)

## WRE's IBM 7090

This is mentioned in Peter Morton's "Fire across the Desert" (AGPS 1989). Briefly:

- March 1960 WRE decision to rent an IBM 7090 for US\$330,000 a year
- delivered at the end of 1960 & handed over Feb 1961
- an IBM 1401 added in Nov 1962 to control I/O
- 1962 WRE purchased the 7090
- Sept 1975 effectively replaced by WRE's IBM 370/168
- late 1976 turned off
- bought by the late David Vigor at auction & (I think) moth-balled.

Considerable information about its use in processing rocket & weapons tests and for physics calculations by DSTO, CSIRO and Universities can be obtained from DSTO reports, scientific journals, conference proceedings, annual reports etc. There are bound to be surprising applications in there!

There is a photo of the WRE 7090 in the National Archives:



Title : TITLE: Research - Space - Salisbury, South Australia - technicians working on IBM 7090 electronic data processing system installed at the weapons research establishment CATEGORY: Photograph PRINCIPAL CREDIT: Australian News and Information Bureau FORMAT: b&w negative TYPE: cellulose acetate STATUS: preservation material  
Date : 1965 Image no. : A1200, L50180 Barcode : 30836486 Location : Canberra  
<http://naa12.naa.gov.au/scripts/PhotoSearchItemDetail.asp?M=0&B=30836486&SE=1>

The installation is also documented in the National Archives:

Title Data Processing - Digital Computers (IBM 7090/1401) - Computer System  
Series number D174 Control symbol SA5398/12/2 PART 1 Contents date range 1959 - 1960  
Not yet examined Location Adelaide Barcode 931792

Title Data Processing - Digital Computers (IBM 7090/1401) - Computer System  
Series number D174 Control symbol SA5398/12/2 PART 2 Contents date range 1961 - 1962  
Not yet examined Location Adelaide Barcode 931793

Title Data Processing - Digital Computers (IBM 7090/1401) - Computer System  
Series number D174 Control symbol SA5398/12/2 PART 3 Contents date range 1962 - 1965  
Not yet examined Location Adelaide Barcode 931795

#### Preserved material

In the possession of Susan Vigor (vigor@iinet.net.au), probably stored near Adelaide.

I don't really know & I haven't seen it & I don't have photos. Anyhow I would estimate floor space at:

cpu 6 sqm, console 2.5 sqm, card rdr 1.5 sqm, card pnch 2 sqm, IBM1401 3 sqm, power? 2 sqm, 8 mag tapes 12 sqm  
total 17 sqm + 1 to 8 mag tapes X 1.5 sqm, ie 18.5 to 29 sqm

Plus a 2nd IBM 1401 (3 sqm), manuals etc.

A full re-creation would fit in about 10 X 8 m (ignoring external power equipment and air-conditioning).

John Deane, Australian Computer Museum Society (jdeane@ihug.com.au), May 2010