

Bulletin

of the Rutherford Appleton Laboratory

26 Jan 1987 No.1

The CRAY moves ahead fast

Since its arrival at the RAL Atlas Centre on 3 December 1986, the Cray has been installed and checked out by the engineering and software analysts and pronounced "in good shape".

Acceptance trials started on 12 January 1987 and will last for two weeks, during which time a group of selected users will run real work on the machine.

On successful completion of the tests CCD staff will have one week, beginning 25 January, to set-up the machine for user-service, (this includes software and operational training) ready for the service to go live on 2 February.

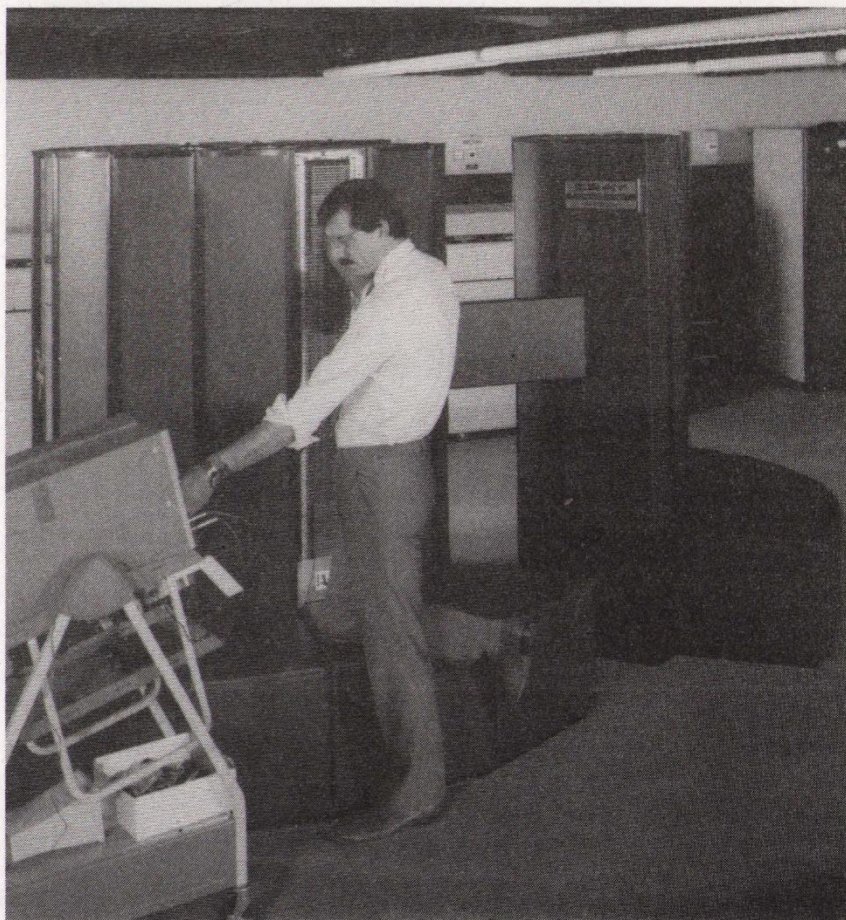
The CRAY X-MP/48 is one of the most powerful computers in the world and its use will be a considerable boost for UK scientists and engineers engaged in a wide range of computer simulation problems.

In many areas of science the laws governing the behaviour of matter and materials are well known, but the application of these laws to complex systems results in equations which require enormous computing power to solve. The advent of supercomputers makes it possible to tackle problems of this type which could not be approached with earlier generations of computers.

These areas spread across the boundaries of the five Research Councils, and many are relevant to the needs of industry. The exploitation of supercomputers is an area of rapidly growing importance, and without appropriate provision of equipment in this country British scientists would not be able to compete internationally, neither would they be able to produce the trained manpower that the UK needs for supercomputing applications in industry and in Government.

It was with this in mind that a working party set-up by the Advisory Board for Research Councils (ABRC), the Computer Board and the University Grants Committee (UGC) recommended the purchase of the CRAY, to be operated on their behalf by SERC as part of a national initiative in research computing, covering all disciplines.

The CRAY X-MP/48 achieves its high performance in three main ways.



The CRAY installed and under test in the Atlas Centre. 86FC 5869.

First, it is constructed from very fast components and all possible steps have been taken in its design to reduce the transit time for electrical signals to move from one point to another. The computer is therefore very compact - it occupies only six square metres of floor space. Its compactness leads to formidable cooling problems and the machine is cooled by Freon refrigerant rather than by the air or water used by more conventional computers.

Secondly, the machine contains special hardware designed to handle vectors (strings of numbers) in much the same way as a conventional computer handles individual numbers.

This can provide large gains in performance when dealing with repetitive operations on arrays of numbers, as for example in doing the kind of matrix algebra which features prominently in solving sets of equations.

Thirdly, the machine contains many functional units which can operate simultaneously, and clearly, the more one can exploit this parallelism, the greater the overall performance.

These features apply to all CRAY computers. The strength of the X-MP/48 lies in its provision of a

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The CRAY

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further element of large-scale parallelism. It is in effect four complete computers in one box and by running them almost as four independent machines or by adding extra instructions to programmes one can make all four processors cooperate on a single job.

The X-MP/48 has 8 million 64-bit words of memory and a 32 million word solid state device (SSD) to be used for data files which are required frequently by user programs. Use of the SSD can make it feasible to perform certain types of calculations which might otherwise be impractical if one had access only to traditional, and much slower, disk drives for such data storage.

The Cray also has its own conventional disk drive units and it will have access to other facilities which are now available on the IBM mainframe computing facility at RAL. This IBM system will act as a 'front end' to the Cray. It will provide the route into the Cray from JANET; it will be the machine on which much of the preparatory work is done by users before they submit their jobs to the Cray and it will provide large-scale storage facilities for long-term data storage. In time, further front-end machines providing somewhat different facilities may be added as funds become available.

For further information contact:

Dr Brian Davies, Ext. 5547 or
Mr D G House, Ext. 5514.

Library Notice

Both copies of the book "The Study of Elementary Particles by the Photographic Method", by C F Powell and P H Fowler have disappeared from the Library.

As it is now impossible to replace this authoritative work, we would be grateful if the missing copies were returned immediately.

Move over

Moves within the Library area are now complete, and we thank everyone for their forbearance with the dirt and noise.

The small study rooms have gone but there is an office in the Stack area for quiet working. The Trade Catalogue Library has also moved to the Stack area (in the corridor by the office).

Electronic data manuals are now on the general reference shelves, and the Xerox is across the corridor from the Library in a new cooler area where we hope that it will have fewer breakdowns.

Missing

Radiation monitor

Are you waiting for the next nuclear disaster?

Someone borrowed our radiation monitor from the Magnetospheric Plasma Lab in R25 about the time of the Chernobyl accident, and has not bothered to return it.

It is a MiniInstrument type E, serial no.3889, measures 8x4x4 inches, with a handle and a detachable G-M tube on top.

We need it TODAY. So if you have it, or know where it is, please return it or contact Geoff Grayer Ext 6511.

Christian Fellowship

Meetings of the Fellowship are held in R2 Conference Room at 12.30 pm every Thursday.

All are very welcome.

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|--------|---------------------------|-----------------|
| 22 Jan | Tape presentation | John Hogston |
| 29 " | Bible Study | Meyrick Wyard |
| 5 Feb | "Christians & the Occult" | Eric Greenslade |
| 12 Feb | Prayer Meeting | Jim Darius |

For more information contact
Margaret Summers Ext. 5617.

Darts League

The RAL Winter Darts League will start in the near future.

Teams will comprise four players. Matches will consist of one team game and four singles. A fee of £1 per person will be charged plus a match fee of 20p per person.

Please send f1s, with names, as soon as possible to A Napper, R9 Metal Stores.

A set of rules etc will be issued at a later date.

INTERNAL Events

NEUTRON DIVISION SEMINARS
R3 CONF. RM - 1300 hrs.

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|---------|---|
| 3 Feb. | Prof Mike Springford/Sussex |
| | 'New experiments in heavy-ion thermion metal'. |
| 10 Feb. | Dr R Friend/Cambridge |
| | 'Anisotropic electronics properties of conjugated polymers'. |
| 24 Feb. | Dr U Steinenberger/RAL |
| | 'Magnetic semiconductors, and neutron scattering experiments with polarisation analysis.' |

ASTROPHYSICS EVENTS

R61 CONF. RM - 1400 hrs

28 Jan. Dr Brian Evans/Read

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R61 CONF. RM - 1400 hrs.

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|---------|---|
| 28 Jan. | Dr Brian Evans/Reading |
| | 'Multilayer X-ray and XUV reflectors' |
| 11 Feb. | Dr Brendan Byrne/Armagh |
| | 'IUE spectroscopy of late-type active stars'. |
| 18 Feb. | Dr R J Cohen/Jodrell Bank |
| | 'Masers in star-forming regions'. |



Lectures in this series, usually take place on the second Thursday of each month, in the R22 Lecture Theatre. Starting time is 3.15 p.m. The next one will be on Thursday 12 February.

"MUSEUMS AT THE MILLENIUM"

by

Dr N Cossons

Director, Science Museum

Film Badge Notice

It is period 2 Colour strip PURPLE.

Please be sure you are wearing the current dosimeters and return all beta-gamma films and fast neutron badges promptly and ensure that ALL badges for 1986 have been returned to enable the dose records to be completed.

NEXT FILM ISSUE

Monday 23 February.

Sales to Employees

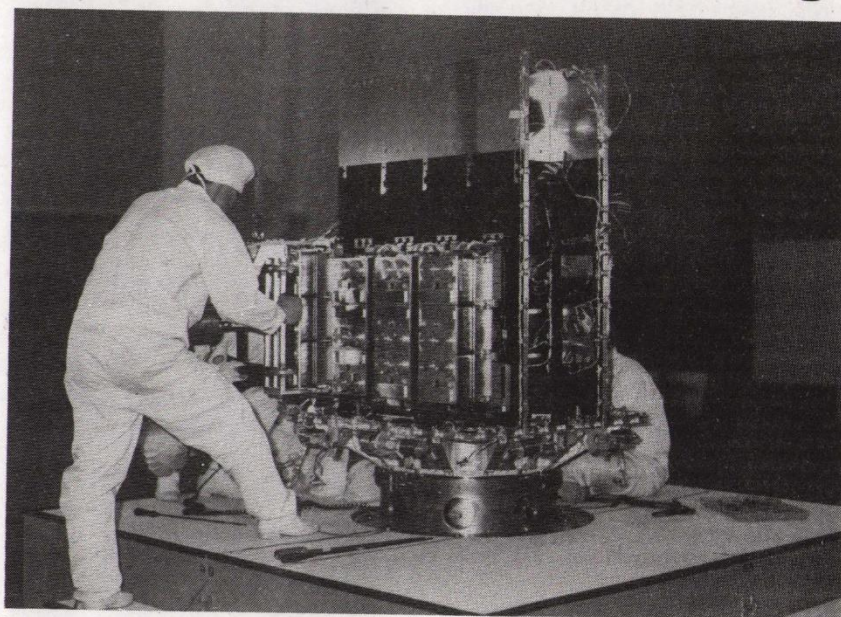
The sale of scrap materials to RAL employees will take place at 12.00 to 12.30 hrs in the R24 Scrap compound on Fridays 6 and 20 February

ASTRO-C Launch scheduled for early February

ASTRO-C, the third Japanese satellite to be dedicated to the field of X-ray astronomy, will be launched within a 10-day "launch window" that commences on February 1st. 1987. In a collaboration with the University of Leicester, RAL have been responsible for the design and construction of a large area proportional counter, known as the LAC, which is the first UK scientific experiment to be launched by Japan.

The experiment is designed to detect cosmic X-ray sources at energies between 2 and 35Kev, and is constructed from eight separate counters, with a total area of 4500sq.cm.. The energy resolution obtainable is approximately 20%, and the spatial resolution, some 1.7x0.8 degrees (cf. the solar angular diameter of 0.5 degrees). During the lifetime of the satellite (anticipated to be 4-5 years) the LAC experiment will be largely used for observing the X-ray variability of such sources as the nuclei of active galaxies, low-mass binary stars, and various black-hole candidates. Whilst many of these have been observed extensively at visible and radio wavelengths, it is at the high energies of the X-ray region that such objects better reveal their true identity. For example, large fluctuations in the X-ray output of certain galaxies has been observed with time scales of minutes, and since the time taken for large luminosity change must exceed the light travel time across the emitting object, then such regions must have dimensions no bigger than our solar system. To postulate physical conditions that explain how vast amounts of energy can be radiated from these small volumes is one of the most challenging problems in present day astrophysics. ASTRO-C will be able to provide new data of such sources, and with an improved sensitivity and time resolution that should put some important observational constraints upon the many theories.

During the latter half of last year, RAL staff attended the spacecraft integration testing at the Institute of Space and Astronautical Science (ISAS) in Tokyo. At these times, the LAC, and other experiments on-board were coupled to the spacecraft, and all the various mechanical, electrical, and electronic interfaces were checked out. The most spectacular test was, as always, the vibration test. For this, the spacecraft is attached to a machine that literally gives it a hard shake, the purpose of which is to simulate the launch conditions and to



determine whether the satellite is capable of surviving the imposed loads. Having survived this it only remained to first to bake the satellite in an evacuated oven, and then to freeze it, all in a bid to simulate the harsh conditions of space. The satellite and its experiments survived these gruelling tests, and are now being moved to the launch site, where they will be fitted to the rocket.

The launch site, known as the Kagoshima Space Centre (KSC), is situated in a remote site at the southern tip of Japan, with the nearest town (Kagoshima itself) being a 3 hour journey by road. During February and March of this year, individuals from RAL and Leicester University will be required to attend KSC during the

all important phases of instrument switch-on and checkout. By mid 1987 the satellite operations should have become more routine, and it is anticipated that the scientific observations will be conducted from the ISAS centre in Tokyo. The opportunity to participate in the observational programme of the LAC is available to all UK astronomers, and it is clear that the Japanese are very willing to collaborate on research projects. We look forward now to a successful ASTRO-C mission, and meanwhile begin work on another Japanese/UK satellite, this time a solar satellite known as SOLAR-A. Watch this space!

B.E. PATCHETT
16 January, 1987

Indoor Sportsday 1987

The OASIS Leisure Centre, Swindon will once again be the venue, for the 1987 SERC Indoor Sports Day.

The date - Friday 6 March.

Events will include:-

Badminton	-	Ladies Pairs
Badminton	-	Mens Pairs
Volleyball	-	Mixed
Table Tennis		
Squash	-	Mixed
Chess		
Bridge		
Darts		
Cribbage		
Snooker		

For details of composition of teams, rules etc see posters on notice board or contact Tudor Morgan Ext. 5563, R. All entries should be addressed to Tudor to arrive by Friday 30 January.

A Disco Supper will be run at Centra Office after the events if demand is high enough. Do please let Tudor know if you are interested.

Time of departure

Wally Bray was invented by Jack Wyatt - at least in his most recent incarnation, said Dr Jim Valentine at Wally's recent retirement ceremony.

In 1984 the problem had arisen, who would take charge of transport section after Jack Russell left? To Jack it was obvious. Wally had the right blend of drive, flair and healthy irreverence for 'authority', needed for success in a tricky job. He was also languishing on alien soil (Swindon) so we brought him back. "It was," Jim said, "one of our better decisions."

RAL originally acquired Wally in 1960 when he joined Nimrod, working on vacuum systems. He was soon involved in Staff Association matters representing the Association of Government Supervisory and Radio Operators on the local Whitley Committee of which he became Secretary.

In 1968, on transfer to Radiation Protection group, he went back to school to learn about radiation protection, which he did with great success.

He became Secretary to SERC Staff side in May 1976 and we lost him to Swindon, where until 1981 he played a prominent part in the Whitley process.

It was not the best day in the history of Council when Wally gave up the job, nor was it an entirely happy transfer back to normal duties for him we understand. Wally spent the next few years in the Engineering Division Secretariats and Directorate of Information Technology until "rescued" - if that is the right phrase - and brought back to RAL.

At the farewell ceremony friends and colleagues from both facets of his working life presented him with mementoes of their happy association. Harry Aram on behalf of the Whitley



Wally watches Jim and Harry (right) struggle with his package.

Council gave him cut glass and thanks for times remembered. Dr Valentine presented camera accessories, a propagator, and the much sought after 'Ray Roberts Card', from RAL.

"Thanks very much," said Wally in reply, "I've had a wonderful time.

Thanks to Transport section who have put up with me, and thanks for the co-operation, help, assistance and hindrance of all RAL staff. You have the best transport system in the Country".

Thanks

from Margaret

Margaret Haddock would like to be remembered to everyone who contributed to "such super presents". Her breifcase is in constant use as a portable office.

She wishes all her ex-colleagues at RAL a very Happy New Year and good wishes for the future.

Wally

Wally Bray wishes to say thank you to all his friends and colleagues for the gifts presented to him on the occasion of his retirement.

His wife Edna also says thanks to everyone for the lovely bouquet.

Jim

Jim Dossett thanks all his friends at RAL for the presentation they gave him in November.

It was unfortunate that he couldn't stay a little longer on that occasion, he writes, but he hopes to be able to visit you again in the future.

and Georgina

Thankyou, everyone, for the lovely presents and for giving me such an enjoyable and memorable send-off.

I intend to keep in touch with you. In the meantime I hope you all have a very happy New Year.

Georgina Howes

Bulletin

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