This indicates that the number of instruction interrupts occurring was 33117, of which 184 were due to compiling.

flow of control through the program on the particular run might well have left some parts of the store untouched. Of the 32 store blocks requested, 25 were actually accessed.

seconds waiting time. Two magnetic tape decks were used with 1294 block transfers and 5

of The input amounted to 36 blocks, i.e. about 1000 cards or 1200 feet

The output stream 0 consisted of 403 lines of printing and output stream 15 consisted of 25 cards.

Warning Sequences on Documents

are not signals for the end of document so much as markers to introduce different parts of a document. The letters are B, E, F, P of document marker A, C or Z. and T. have already seen that the sequence *** can introduce an end Other letters are permissible, but

- В introduces binary information until the physical end of the
- H ***Z on the tape. introduces binary information until the next ***A or ***C or
- 닠 end. This sequence corresponds to ***T and ***B combined so that only one document is read. in the reader is read as binary information to its physical disengages the reader so that when it is re-engaged the tape
- Ч the end of document. cuases the parity checking of 7-track tape to be suspended to
- Н disengages the reader so that when it is re-engaged the same manageable size. document can be continued. This allows tapes to be split to

The end of document markers are *** followed by A, C or

- Þ causes all the document so far read to be erased
- C document on causes the current document to be ended, but introduces a new the same tape.
- N disengaged. causes the current document to be ended and the reader to be

- (ii) Punched Cards The punching of column 80 is interpreted exactly as with paper tape. The letters in order are: All warning sequences are introduced by a 7 and 8 punch in column 1.
- abandon previous card document
- В read binary cards to end of stack.
- end current document and read next document.

C

- 田 read binary cards until next end of document marker
- 埘 disengage reader, and on re-engagement read binary cards to end of stack as part of same document.
- Ч suppress parity check on non-binary cards.
- Н disengage reader, and on re-engaging continue reading cards for same document.
- N end document and disengage reader.

Reference

Preparing a Complete Program for (I.C.T. Limited) Atlas I

August 1964

(This document is the latest repl This document is the latest replacement of Chapter 10 of the Atlas Provisional Programming Manual (CS 348), and also replaces an earlier document entitled "Preparing a Complete Program" dated September 1963.)

(4) USE OF MAGNETIC TAPES

Ampex Tapes

A programmer wishing to use the Ampex tapes must make a request for reels to be made available to him either by telephone or by sending a Magnetic Tape Request Card (see below) to:

Magnetic Tape Librarian, Atlas Computer Laboratory, N.I.R.N.S., Chilton, Didcot, Berkshire.

Telephone: Abingdon 1900 Extension 6640

If the request is by telephone a Request Card must be sent later.

	JOB NO: Please supply	NAME: ADDRESS:		Nati
TITLE	DATE: magnetic tapes titled:		MAGNETIC TAPE REQUEST CARD	National Institute for Research in Nuclear Science ATLAS COMPUTER LABORATORY
			Tel: Abingdon 1900 Extension 6640	nce

for tapes should be made as far in advance as possible before a job is run, since some preliminary work has to be carried out to label and address each reel required. It is important that every request should bear a title. Also, requests

Upon receipt of a request the Tape Librarian will allocate a tape number in the series N0000-N9999 and this number must be given in references to a particular reel in the TAPE or TAPE NEW section of the Job Description (see page 12).

employ the request procedure as the normal way of obtaining tapes for NEW facility, but to simplify the control of tapes users are asked to for the tapes to be titled during the running of a program by the TAPE the tape numbers that have been allocated. private use. The programmer will receive a Magnetic Tape Allocation Card giving ape numbers that have been allocated. It is, of course, possible

TAPE NUMBER TITLE
The following magnetic tapes have been allocated to you as requested:
MAGNETIC TAPE ALLOCATION CARD
NATIONAL INSTITUTE FOR RESEARCH IN NUCLEAR SCIENCE ATLAS COMPUTER LABORATORY

loading reels, but the title, whilst not absolutely necessary to the operators, will be used by the Supervisor as an additional check that the correct tape has been loaded. In general the Operating Staff will use the tape numbers for finding and

released, the Tape Librarian should be When reels are no longer required by the customer and can be informed by a written note.

and users are requested to release tapes no longer required. Periodically a list of tapes held by the customer will be sent out,

Staff will if necessary arrange, in consultation with the user, for a special reading and copying operation; the user of Ampex tapes will be informed of the new tape number to be used in all subsequent operation In the event of difficulty in reading a user's tape the Operating used in all subsequent operations. the user of Ampex tapes will be

I.B.M. Tapes

will be made available to users wishing to take away reels from the Laboratory. If reels are required for subsequent off-line processing the Atlas Computer Laboratory, but it is not expected that these tapes at another installation, the customer necessary reels. A small quantity of IBM tapes will be available for internal use by s organisation must supply the

(5) DATA PREPARATION SERVICE

cards and paper tape from programs and data in manuscript form. In addition users requiring copies of either cards or paper tape may ask for copies to be made. A card sorter is provided, and whilst some small amounts of card sorting will be undertaken the user will be asked to deal with large quantities himself. The Laboratory can provide a service for the preparation of punched

Card and Paper Tape Punching Service

7 channel and 5 channel paper tape. A request for punchi made on a Card and Paper Tape Preparation Request form to: Racilities are available for card punching and for punching both nnel and 5 channel paper tape. A request for punching must be

Data Preparation Section, Atlas Computer Laboratory, N.I.R.N.S., Chilton, Didcot, Berkshire.

Telephone: Abingdon 1900 Extension 6284

Supplies of blank forms may be obtained from this section.

TYPE OF WORK TYPE OF CODING TYPE OF CODING PAPER TAPE 5 CHANNEL PAPER TAPE 7 CHANNEL PUNCH AND LIST COPY TAPE COPY TAPE PUNCH AND COPY TAPE CARDS PUNCH PUNCH PUNCH PUNCH VERIFY LIST ANY OTHER CODE (PLEASE ANY OTHER CODE (PLEASE ANY OTHER CODE (PLEASE INTERPRET		007			-
TYPE OF CODING TYPE OF CODING PAPER : PAPER		COBT		LAYOUT REQUIRED	SPECIFY
PAPER : PAPER	ä	INTERPRET	Ter ha	FR CODE (PI FASE	ANY OTH
PAPER : PAPER : PAPER : PAPER : PAPER : PAPER : CARDS L. CARDS CARDS		REPRODUCE	1 1 1	UTOCODE	ATLAS A
PAPER : PAPER		LIST		RCURY AUTOCODE	EXT. MEI
PAPER : PAPER	1.45	VERIFY		AUTOCODE	MITROUR
PAPER : PAPER		PUNCH			
PAPER : PAPER		CARDS			ALGOL.
PAPER TAPE 5 PAPER TAPE 7 PUNCH TRAN COPY		PRINT AND COPY TAPE	5	THE SIZE NO.	ABL.
PAPER TAPE 5 PAPER TAPE 7 PUNCH		COPY TAPE	1,000	AND TAKE THE	ASP.
PAPER TAPE 5 PAPER TAPE 7 PUNCH		EDIT		Z	FORTRA
PAPER TAPE 5 CHANNEL PAPER TAPE 7 CHANNEL		PUNCH AND LIST		TYPE OF CODING	H
PAPER TAPE 5 CHANNEL		PAPER TAPE 7 CHANNEL			
TYPE OF WORK		PAPER TAPE 5 CHANNEL	With party and allo	THE STREET STREET	
		TYPE OF WORK			
					TEL. NO.
TEL. NO.					NAME
NAME					DATE
DATE		ABORATORY Berks. PARATION REQUEST	ATLAS COMPUTER LA Chilton, Didcot, D PAPER TAPE PREF		Tel: Abingdon Extension
1900 CARD AI		in Nuclear Science	Institute for Research	Nationa	
National Institute for Research in Nuclear Science ATLAS COMPUTER LABORATORY Tel: Chilton, Didcot, Berks. Extension 6284 CARD AND PAPER TAPE PREPARATION REQUEST DATE DATE VAME TEL. NO.					

Conventions in Coding

be distinguished; those most easily confused are given below together with the conventions, where they exist, letters: Particular care is necessary if certain figures and letters are to which should be used for the

Distinguish 6 (Distinguish 0 (Distinguish 1 (one) from I (the letter)
Distinguish 1 (one) from / (oblique) Distinguish (six) from G (zero) from O (the letter) (two) from Z use 0 use I use Z

To indicate spaces, use a circle with a number enclosed. Thus $A(\frac{1}{4}, \dots, B(\frac{1}{2})$. C indicates AbbbbbbbC (where b stands for a blank space). The number $(\frac{1}{4})$ takes up one space for a blank space). The number (4) takes up one space and three spaces should then follow on the Coding Form.

attached to the manuscript. following characters are

Any coding used, other than the conventional one, must be clearly stated either on the back of a Fortran or ASP Coding Form or on a separate note

preferred: For Mercury Autocode programs the

0 not not not < X

Laboratory (External Reception). Other forms for AEL, Mercury Autocode and other programming languages and for data will be available at a later date. All work submitted should be written. written or printed sheet.

by a Fortran-type format. When requiring large programs to be punched, rather than wait for the whole program to be written it would assist the punching staff if users would send ten pages or so at a time. The layout of data required must be specified by an example and not

The programmer will find that a clear and legible coding sheet or manuscript in which the above conventions have been used will eliminate many errors.

Users' Equipment

for the preparation of a small number venience of users. card punch for more than five minutes, or a Flexowriter for more than alterations to paper tape. fifteen minutes, if others are waiting; A number of card punches and Flexowriters are provided for the con-It is intended that these machines should be used Programmers will not be allowed to use a of correction cards or for minor the users waiting have the right

Please tick the appropriate boxes for both type of work and type of coding.

to request a person occupying a machine for longer than these times to vacate it.

Users are asked to inform the Head of the Data Preparation Section if they find that machinery is faulty, so that repairs can be carried out; programmers are urged to do this even if they move to another machine to carry out their own work.

Everyone using this machinery is particularly asked to ensure that the equipment is left clear of used cards or paper tape, and that unused cards are returned to the racks provided.

Care and Use of Paper Tape and Punched Cards

Users are reminded that paper tape and cards must be handled carefully. Anything sent through the post should be firmly packed and protected from being crushed. There are a number of commercial products available to ensure the safe transit of cards and paper tape, and those marketed by Punched Card Accessories Limited, Townsend House, Greycoat Place, London S.W.1 are recommended.

The following is a general guide to good practice:

(i) Paper Tape

- . Keep all paper tape free from contact with dirty surfaces.
- b. Ensure that tapes are punched on equipment which has been correctly set. The requirements are given in the I.C.T. document "Specification of Dimensions for Punched Tapes" CS 364.
- C. Use the paper tape specified for I.C.T. computers and made by Waterlow and Sons Limited, 85 London Wall, London E.C.2.. See I.C.T. document "Specification of Paper for Punched Tapes" CS 363.
- d. Do not use oiled tape.
- e. If splices are necessary, they must be carefully made. The Atlas Computer Laboratory have found that the Daprotape Tape Splicer manufactured by Punched Card Accessories Limited produces a good splice and is efficient and accurate.
- f. Leave a 6" run-out at the beginning of the tape. On this run-out write a title which will enable the operators to identify the owner of the tape and the job to which it belongs.

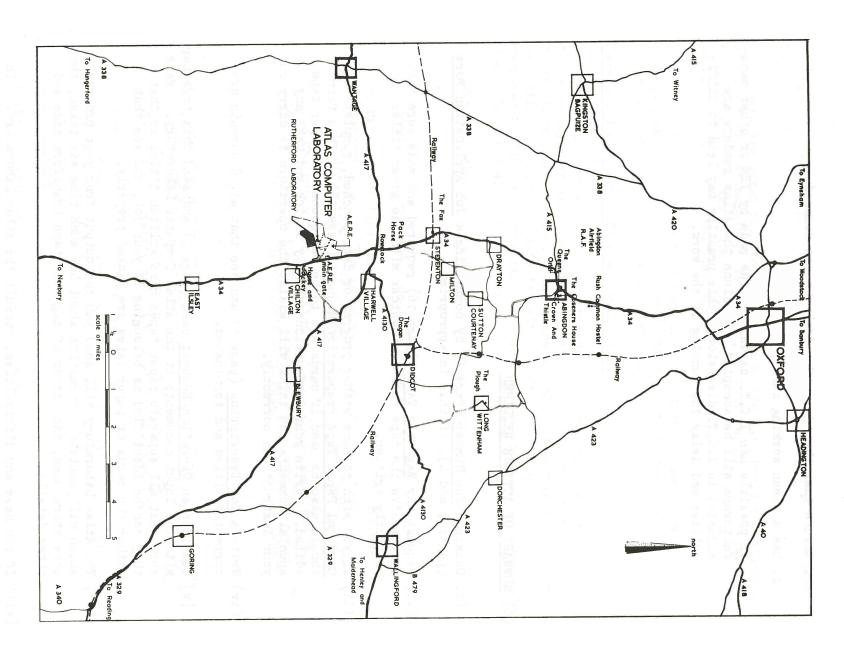
(ii) Punched Cards

a. Store cards away from heat and damp.

- b. Ensure that the edges of a deck are not damaged.
- . Use a clean working surface.
- d. If possible use I.C.T. cards. Cards made by IBM or other manufacturers will be accepted, but since the Atlas readers are adjusted to I.C.T. dimensions, this practice may lead to difficulties and delay the running of the work.

(6) SUMMARY OF ACTIONS REQUIRED

- (i) Obtain a Job Number (page 1) by completing a Job Application Form (pages 3 and 4), if this is appropriate.
- (ii) Request any Magnetic Tapes (page 16) required and make sure that you receive the tape numbers together with the given titles correctly written.
- (iii) If you wish to have either program or data punched, complete a Card and Paper Tape Preparation Request (page 18). This form should also be used if cards are to be reproduced or paper tape edited. Write your instructions clearly in ink and make any special comments you think will assist the operators to carry out your instructions correctly.
- (iv) Write a Job Description (page 6) and see that all documents are correctly titled and terminated.
- (v) Complete an Operation Request card (page 5) and send this together with the input documents to the Atlas Computer Laboratory. Make sure that all separate paper tapes have written titles so that they can be identified as belonging to your job, and see that either the cards or paper tapes are packed properly.
- vi) The Atlas Laboratory will send you the output from your program which will contain information about how much time was taken, the core store used, the number of magnetic tape transfers made and other details.
- (vii) If you have any difficulties, consult the Atlas Laboratory. The list of telephone extensions given in Appendix III will help you.



A.E.R.E. HARWELL

MAIN GATE

OXFORD

ROAD A.34

RUTHERFORD HIGH ENERGY LABORATORY

ROAD A.34

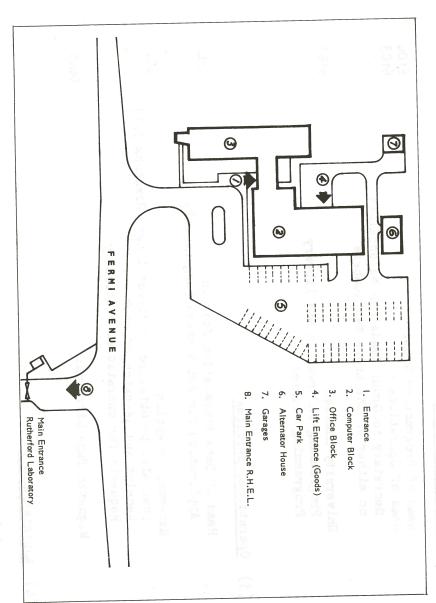
NEWBURY

ATLAS COMPUTER LABORATORY

MAIN GATE R.H.E.L.

TO R.H.E.L

APPENDIX I: Map showing situation of the Laboratory



APPENDIX II: Approach to Laboratory and plan of building

APPENDIX III: Some Laboratory Telephone Extensions Which May Help Users

(Exchange Number: Abingdon 1900)

Extension

Magnetic Tape Librarian	External Reception (can also be obtained on direct line: Rowstock 321) Receipt and despatch of work Requests for operational stationery	(3) Operational Services Head of Data Preparation Section Application for Job Numbers (urgent only)	University Liaison Programming information and library Programming courses	Head of Programming Group Head of Operations Secretary to Group Heads can be obtained on either of the above two numbers	(2) Technical Enquiries	Front Hall Reception Users are asked to call this number for accommodation and transport bookings	Director Secretary to Director	(1) General Enquiries
0466	429	6284	6193	6104 6103		6296	547 423	

(4) Administration

Laboratory Administrative Officer

6106

