

October, 1963.

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Comm 14(b)

NI/63/18

NATIONAL INSTITUTE FOR RESEARCH IN NUCLEAR SCIENCE

GOVERNING BOARD

Estimate of Expenditure 1964/65
and Forecast Estimates 1965/66 and 1966/67

The following estimates are submitted for approval:-

	<u>1963/64</u>	<u>1964/65</u>	<u>1965/66</u>	<u>1966/67</u>	
	<u>Estimated</u>	<u>Estimate</u>	<u>Forecast</u>	<u>Forecast</u>	<u>Page</u>
	<u>Out-turn</u>				
	<u>£000</u>	<u>£000</u>	<u>£000</u>	<u>£000</u>	
<u>Rutherford Laboratory</u>					3
Capital	3,236	1,926	1,595	1,707	4-7
Non-capital	4,007	4,576	5,086	5,586	8
Total	7,243	6,502	6,681	7,293	
<u>Electron Laboratory</u>					9
Capital	460	1,764	1,746	1,230	10
Non-capital	169	390	587	752	11
Total	629	2,154	2,333	1,982	
<u>Future Major Accelerators</u>					12
Capital	-	10	450	890	12
Non-capital	-	-	50	140	12
Total	-	10	500	1,030	
<u>Atlas Computer Laboratory</u>					13
Capital	930	1,084	949	489	14-15
Non-capital	200	362	472	493	16
Total	1,130	1,446	1,421	982	
	<u>1963/64</u>				
	<u>Grant</u>				
	<u>£000</u>				
<u>Gross Total</u>					
Capital	4,422	4,695	4,784	4,740	4,316
Non-capital	4,023	4,307	5,328	6,195	6,971
Total	8,445*	9,002	10,134	10,935	11,287
Less receipts	120	150	226	338	468
	8,325*	8,852	9,886	10,597	10,819
Less shadow cut			460	250	-
<u>Net total</u>	<u>8,325*</u>	<u>8,852</u>	<u>9,426</u>	<u>10,347</u>	<u>10,819</u>

*But an increase of up to £600,000 was authorised on 2.8.63

The Estimate for 1964/65 has been kept down to £8.2 million excluding Atlas and receipts, as agreed with the Minister for Science's Office. This was the sum shown in the recent five-year forecast (NI/63/4) but the ordinary recurrent expenditure at the Rutherford Laboratory is now known to have been seriously underestimated in the five-year forecast as can be seen by comparing the non-capital figures in the table on page 2. The limitation to £8.2 million will restrict the exploitation of Nimrod in its first full year of operation and necessary capital development at the Rutherford Laboratory will also have to be deferred until 1965/66

The forecast estimates excluding Atlas and receipts exceed the amount in the five-year forecast by £0.53 million in 1965/66 and by £0.61 million in 1966/67 although they include about £0.5 million less for future major accelerators in each year.

ESTIMATES OF N.I.R.N.S. EXPENDITURE 1964/65

COMPARISON WITH PREVIOUS FORECASTS £000

	<u>1964/5</u>	<u>1964/5</u>	<u>1964/5</u>
	<u>Forecast in</u>	<u>Current</u>	<u>This</u>
	<u>last year's</u>	<u>5-year forecast</u>	<u>Estimate</u>
	<u>Estimates</u>	<u>NI/63/4 (a)</u>	
	<u>NI/GP/62/28</u>	<u>(Not yet approved</u>	
		<u>by the Treasury)</u>	
<u>Rutherford Laboratory</u>			
Capital	2,412	2,570	1,926
Non-capital	3,766	3,850	4,576
Total	<u>6,178</u>	<u>6,420</u>	<u>6,502</u>
<u>Electron Laboratory</u>			
Capital	991	1,860	1,764
Non-capital	562	430	390
Total	<u>1,553</u>	<u>2,290</u>	<u>2,154</u>
<u>Future Major Accelerators</u>			
Capital	-	included in	10
Non-capital	-	Rutherford	-
Total	<u>-</u>	Laboratory	<u>10</u>
Shadow cut	500	500	460
Total of R.L., E.L. and F.M.A. less shadow cut	<u>7,231</u>	<u>8,210</u>	<u>8,206</u>
<u>Atlas Computer Laboratory</u>			
Capital	1,031	1,130	1,084
Non-capital	487	330	362
Total	<u>1,518</u>	<u>1,460</u>	<u>1,446</u>
Gross total	8,749	9,670	9,652
Less receipts	230	270	226
Net total	<u>8,519</u>	<u>9,400</u>	<u>9,426</u>

- (a) The amended version of NI/63/4, circulated on 15.5.63, which takes account of the revised Electron Laboratory estimate approved by the G.P.C. on 13.5.63.

The 5-year forecast as submitted to the Minister for Science (NI/GP/63/10) is consistent with the above, but does not give the figures in this form.

Rutherford High Energy Laboratory

Summary of Estimates 1964/65, 1965/66 and 1966/67 - £000

	<u>1963/64</u>	<u>1964/65</u>	<u>1965/66</u>	<u>1966/67</u>
<u>Capital</u>				
Schemes in Progress				
(August, 1963)				
- Plant	2,647	1,142	114	-
- Buildings	569	237	-	-
	<u>3,216</u>	<u>1,379</u>	<u>114</u>	<u>-</u>
Schemes not yet started				
(August, 1963)				
- Plant	20	430	1,050	1,470
- Buildings		117	431	237
	<u>20</u>	<u>547</u>	<u>1,481</u>	<u>1,707</u>
Total Capital				
- Plant	2,647	1,572	1,164	1,470
- Buildings	589	354	431	237
	<u>3,236</u>	<u>1,926</u>	<u>1,595</u>	<u>1,707</u>
<u>Non-Capital</u>				
Standing Charges				
Group Budgets				
	2,065	2,411	2,521	2,741
	1,942	2,165	2,565	2,845
	<u>4,007</u>	<u>4,576</u>	<u>5,086</u>	<u>5,586</u>
	3,236	1,926	1,595	1,707
	4,007	4,576	5,086	5,586
	<u>7,243</u>	<u>6,502</u>	<u>6,681</u>	<u>7,293</u>
Capital				
Non-Capital				
R.H.E.L. Total				

Rutherford High Energy Laboratory
Capital Estimates 1964/65, 1965/66 and 1966/67 - £000

<u>Plant - Schemes in Progress</u>		<u>Total Cost</u>	<u>1963/64</u>	<u>1964/65</u>	<u>1965/66</u>	<u>1966/67</u>	<u>Later Years</u>	<u>Remarks</u>
<u>£100,000 and over</u>								
<u>NRO</u> *								
1-7	<u>Nimrod</u>	7,580	541	200				
21	- Heavy Liquid Bubble Chamber	418	105	150	24			
22	- Helium Bubble Chamber	471	117	250	90			
-	- Hydrogen Bubble Chamber	375	375					
30	- Beam Handling Plant - Ph. I	1,000	540	200				
30	- Beam Handling Plant - Ph. II	400	113	287				
30	- Parasitic Area Extension - Shielding	125	101	24				
38	<u>General</u> - Orion Computer	355	202	15				
		-	2,094	1,126	114			
<u>Under £100,000</u>								
41-6	<u>Nimrod</u>	-	39	-				
24	- Track Analysis Equipment	80	40	11				
26	- H.E.P. Apparatus - Cabling	90	85	3				
34	<u>P.L.A.</u> - Analysing Magnets	89	74	2				
	<u>General</u> - Schemes under £25,000 and minor items for Group Budgets	-	315					
		-	553	16				
		-	2,647	1,142	114			

* The numbers in the column headed NRO are for internal Laboratory reference purposes.

R.H.E.L.

MANAGEMENT COMMITTEE ONLY

Capital Estimates 1964/65, 1965/66 and 1966/67 - £000

	<u>Total Cost</u>	<u>1963/64</u>	<u>1964/65</u>	<u>1965/66</u>	<u>1966/67</u>	<u>Later Years</u>	<u>Remarks</u>
<u>Plant - Schemes in Progress</u>							
<u>Under £25,000</u>							
Magnet and P.S. - Nimrod Physics	15	15					
Minor Plant for Group Budgets	-	300					
	-	315					
<u>Plant - Schemes not yet started</u>							
Minor Capital for Group Budgets							
Applied Physics							
P.L.A. and H.E. Physics			315	450	500	500	
E.M.R. and Experimental Agreements	-						
Reactors							
Engineering							
Administration							
P.L.A. Bending Magnets	-						
Nuclear Physics Apparatus	-						
Nimrod Spares	-						
			400	450	500	-	

Rutherford High Energy Laboratory

Capital Estimates 1964/65, 1965/66 and 1966/67 - £000

	<u>Total Cost</u>	<u>1963/4</u>	<u>1964/5</u>	<u>1965/6</u>	<u>1966/7</u>	<u>Later years</u>	<u>Remarks</u>
<u>Plant - Schemes not yet started</u>							
<u>£100,000 and over</u>							
<u>Nimrod</u>	750						
- H.E.P. Apparatus			-	100	150	500	
- Machine Improvements	-		-	10	200	250	Continuing
- Beam Handling Plant - Ph. III	1,000		-	-	50	950	
<u>P.L.A.</u>	5,000		-	-	-	5,000	
- Machine Extension							
<u>General</u>	120		-	30	70	20	
- Helium Liquefier							
	-		-	140	470	-	
<u>Under £100,000</u>							
<u>Nimrod</u>	-						
- H.E.P. Apparatus			10	50	100	200	Continuing
- Track Analysis Equipment	-		10	200	200	200	Continuing
- Special Beam Equipment & Magnets	-		-	150	200	250	Continuing
<u>P.L.A.</u>	70		10	60			
- Tank I Improvement							
<u>General</u>	-		400	450	500	500	Continuing
- Schemes under £25,000 and minor items for group budgets	-		430	910	1,000	-	
	-		430	1,050	1,470	-	

Rutherford High Energy LaboratoryCapital Estimates 1964/65, 1965/66, and 1966/67 - £000Buildings - Schemes in Progress£100,000 and over

	<u>Total Cost</u>	<u>1963/64</u>	<u>1964/65</u>	<u>1965/66</u>	<u>1966/67</u>	<u>Later Years</u>	<u>Remarks</u>
<u>Nimrod</u>							
- Phase I Buildings	3,160	80	20				
- Extension to Control Building R.2	223	85	62				
- Heavy Liquid Bubble Chamber Annexe	41	4	-				
- Extension to Parasitic Area	61	35	8				
<u>P.L.A.</u>							
- Nuclear-Chemistry Laboratories & Offices	273	17	-				
<u>General</u>							
- Orion Computer Building 03	47	10	2				
- Heavy Laboratory & Office Block - R.25 03	221	27	7				
- Restaurant 03	106	25	10				
- Houses at Didcot 03	120	2	-				
- Houses at Abingdon 03	108	93	10				
- Phase II Buildings 03	412	18	-				
	-	396	119				
<u>Under £100,000</u>							
<u>Nimrod</u>							
- Experimental Area Extension	78	19	20				Incl. HeBC Compressor Room
<u>General</u>							
- Extension to Electronics W/S - R.18 02	48	25	12				
- Lecture Theatre 03	47	15	21				
- Substation 13 02	31	12	2				
- Substation 14 02	44	20	21				
- Site Power Distribution 02	74	30	32				
- Roads & Car Parks 03	53	10	8				
- Schemes under £25,000	-	42	2				
	-	173	118				
	-	569	237				

R.H.E.L.

MANAGEMENT COMMITTEE ONLY

Capital Estimates 1964/65, 1965/66 and 1966/67 - £000

	<u>Total Cost</u>	<u>1963/64</u>	<u>1964/65</u>	<u>1965/66</u>	<u>1966/67</u>	<u>Later Years</u>	<u>Remarks</u>
<u>Buildings - Schemes in Progress</u>							
<u>Under £25,000</u>							
R.20 Extension 03	17	2-					
Ancillary Maintenance Building 02	41	1-					
Plant Store 02	43	1-					
Street Lighting 03	10	3-					
Main Drainage 02	52	3-					
Surface Water Drainage 02	9	2-					
Landscaping Main Spoil Heap 03	22	3-					
Site Fire Alarm 02	6	5-					
Extension to Road 8 03	5	2-	1				
Extension to Bldg. R.8 03	5	4-	1				
Extension to Bldg. R.32 03	4	4-					
Centralised Cooling Water Scheme - R.25 02	17	2-					
Miscellaneous 03	-	10-					
	-	42	2				
	-	14 28					
		02 03					

R.H.E.L.

MANAGEMENT COMMITTEE ONLY

Capital Estimates 1964/65, 1965/66 and 1966/67 - £000

	<u>Total</u>	<u>1963/64</u>	<u>1964/65</u>	<u>1965/66</u>	<u>1966/67</u>	<u>Later</u>	<u>Remarks</u>
	<u>Cost</u>					<u>Years</u>	
Buildings - Schemes not yet started							
Under £25,000							
Magnet Room Access	15			10	5		
Injector Room Access	7		7	-	-		
Irradiation Building	5		-	5	-		
Mercury Maintenance Building	10		5	5	-		
Coseners House Extension	16		1	15	-		
Ventilation of Bldg. R.4	5		5	-	-		
Enlargement of Chilton Pond	2		-	2	-		
Low Background Laboratory 08	11	1	-	10	-		
Chilton House and Modifications 03	9	1	8	-	-		
Turfing and Seeding 03	3	1	2	-	-		
R. 5/6 lavatories 03	6	1	5	-	-		
Site Power Distribution - Sub. 13 02	17	2	-	15	-		
Contractors W/S Area 02	4	4	-	-	-		
Suite 3 P.L.A. Nuclear Chemistry Lab.	10		-	3	7		
Miscellaneous	-		14	50	50	50	
	-	10	47	115	62	50	

Rutherford High Energy Laboratory

Capital Estimates 1964/65, 1965/66 and 1966/67 - £000

	<u>Total Cost</u>	<u>1963/64</u>	<u>1964/65</u>	<u>1965/66</u>	<u>1966/67</u>	<u>Later Years</u>	<u>Remarks</u>
<u>Buildings - Schemes not yet started</u> <u>£100,000 and over</u>							
<u>Nimrod</u>							
- Aux. Building for H.E. Physics	100		-	50	40	10	
- 2nd Main Experimental Area	290				50	240	
- Physics and Office Block	250				10	240	
- Power Supplies & Special Services	150				10	140	
<u>P.L.A.</u>	1,000					1,000	
- Machine Extension							
<u>General</u>	150		5	90	55		
- Electronics Bldg. & Office Block			5	140	165	-	
<u>Under £100,000</u>							
<u>Nimrod</u>	50		5	45			
- Hydrogen Target & Remote Test Bldg.							
<u>P.L.A.</u>	30		-	30			
- Building Modifications							
<u>General</u>	61		50	11	10		
- Heavy Plant Store	40		5	25			
- Cooling Towers Extension	80	10	5	65			
- Chilton Houses ⁰²	-	10	47	115	62	50	1963/4-land purchase
- Schemes under £25,000							
	-	20	112	291	72	-	
	-	20	117	431	237	-	

Rutherford High Energy Laboratory

Non-Capital Estimates 1964/65, 1965/66 and 1966/67 - £000

	<u>1963/64</u>	<u>1964/65</u>	<u>1965/66</u>	<u>1966/67</u>
<u>Standing Charges - note 1</u>				
Salaries and Wages	1,264	1,350	1,420	1,550
Travel and Subsistence Expenses	77	90	100	100
Houses, Hostel & Restaurant Exes.	31	43	45	45
Electricity, Rates, Telephones etc.	292	523	576	676
U.K.A.E.A. Charges				
Overheads etc.	155	170	170	170
Site Services	100	130	130	130
General Services	215	185	180	180
	2,134	2,491	2,621	2,851
<u>Less Costs attributable to the Atlas Laboratory</u>	69	80	100	110
	2,065	2,411	2,521	2,741
<u>Group Budgets - note 2</u>				
Applied Physics	820	775	900	950
P.L.A. and H.E. Physics	677	775	900	950
University E.M.R. and Experimental Agreements	160	250	300	350
Reactors	110	150	200	300
Engineering	100	105	130	145
Administration	75	110	135	150
	1,942	2,165	2,565	2,845
Standing Charges	2,065	2,411	2,521	2,741
Group Budgets	1,942	2,165	2,565	2,845
	4,007	4,576	5,086	5,586
<u>Staff in post at 31st March</u>	<u>1964</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>
Professional	343	365	405	440
Ancillary	338	350	415	430
Industrial	230	250	270	280
	911	965	1,090	1,150

Note 1: These are charges over which little or no day to day control is possible.

Note 2: These charges are under the control of group leaders.

R.H.E.L.

MANAGEMENT COMMITTEE ONLY

Non-Capital Estimates 1964/65, 1965/66 and 1966/67 - £000

<u>Standing Charges</u>	<u>1963/64</u>	<u>1964/65</u>	<u>1965/66</u>	<u>1966/67</u>
<u>Salaries and Wages</u>				
Salaries and Wages	1,158	1,235	1,300	1,420
Superannuation	83	90	95	105
Overseas Salaries	23	25	25	25
	1,264	1,350	1,420	1,550
<u>Travel and Subsistence Expenses</u>				
Travel and Subsistence	52	60	65	65
F.S.A. and Air Travel	20	25	30	30
Transfer Grants	5	5	5	5
	77	90	100	100
<u>Houses, Hostel and Restaurant Exes.</u>				
Houses	6	8	10	10
Hostel	10	10	10	10
Restaurant	15	25	25	25
	31	43	45	45
<u>Electricity, Rates, Telephones etc.</u>				
Electricity	170	370	410	490
Rates	34	45	60	70
Telephones	24	30	30	35
Cleaning	25	30	35	40
Advertising	7	12	5	5
Training	5	5	5	5
Consultants and Fees	22	25	25	25
Security	5	6	6	6
	292	523	576	676
<u>U.K.A.E.A. Charges</u>				
AERE Overheads	135	150	150	150
AERE Interest on Capital	20	20	20	20
AERE Site Services	100	130	130	130
AERE Electronics (excl. stores)	80	80	80	80
AERE Services to Construction Team	15	10	10	10
AERE Attached Staff	20	20	20	20
AERE Miscellaneous	30	30	30	30
E.G. Inspection and Progress	30	20	20	20
E.G. Vacuum Testing	15	5	-	-
E.G. Construction Team	25	20	20	20
	470	485	480	480

MANAGEMENT COMMITTEE ONLY

NATIONAL INSTITUTE FOR RESEARCH IN NUCLEAR SCIENCE

Estimates 1964/65, 1965/66 and 1966/67 - £000

	<u>1963/64</u>	<u>1964/65</u>	<u>1965/66</u>	<u>1966/67</u>
<u>Receipts - R.H.E.L. and A.C.L.</u>				
Housing	14	16	17	17
Hostel	5	5	6	6
Restaurant	13	20	20	20
V.E.C. (A.E.R.E.)	78	50	20	-
Mercury Computer Team (A.E.R.E.)	15	5	-	-
Atlas Charges	-	80	200	300
Charges for Physics on PLA & Nimrod	20	45	70	120
Miscellaneous	5	5	5	5
	150	226	338	468

ELECTRON LABORATORY

Summary of Estimates 1964/65, 1965/66 and 1966/67 - £000

	<u>1963/64</u>	<u>1964/65</u>	<u>1965/66</u>	<u>1966/67</u>
<u>Capital</u>				
Schemes in Progress - Plant	300	864	666	520
(August, 1963) - Buildings	140	830	920	330
	<u>440</u>	<u>1,694</u>	<u>1,586</u>	<u>850</u>
Schemes not yet started - Plant	-	10	40	280
(August, 1963) - Buildings	20	60	120	100
	<u>20</u>	<u>70</u>	<u>160</u>	<u>380</u>
Total Capital - Plant	300	874	706	800
- Buildings	160	890	1,040	430
	<u>460</u>	<u>1,764</u>	<u>1,746</u>	<u>1,230</u>
<u>Non-Capital</u>	<u>169</u>	<u>390</u>	<u>587</u>	<u>752</u>
Capital	460	1,764	1,746	1,230
Non-Capital	169	390	587	752
<u>E.L. Total:</u>	<u>629</u>	<u>2,154</u>	<u>2,333</u>	<u>1,982</u>

ELECTRON LABORATORY

Capital Estimates 1964/65, 1965/66 and 1966/67 - £000

	<u>Total Cost</u>	<u>1963/64</u>	<u>1964/65</u>	<u>1965/66</u>	<u>1966/67</u>
<u>PLANT</u>					
<u>Schemes in Progress</u>					
NINA Project	1,760	210	764	546	390
Minor Plant	-	90	100	120	130
	-	300	864	666	520
<u>Not Yet Started</u>					
External Electron Beam	310	-	-	10	140
Physics Apparatus	-	-	10	30	140
	-	-	10	40	280
<u>BUILDINGS</u>					
<u>Schemes in Progress</u>					
NINA Project	2,120	140	830	920	330
<u>Not Yet Started</u>					
Canteen	50	-	30	20	-
Hostel and Flats	150	-	-	50	50
Minor Works	-	20	30	50	50
	-	20	60	120	100

The total of the figures by years for NINA plant and NINA buildings exceeds the total cost figures of 1,760 and 2,120 by 250 in all. This is balanced by the shadow cut of 250 in 1965/66.

ELECTRON LABORATORYNon-Capital Estimates 1964/65, 1965/66 and 1966/67 - £000

	<u>1963/64</u>	<u>1964/65</u>	<u>1965/66</u>	<u>1966/67</u>
Salaries, Wages etc.	50	140	237	302
Administrative Expenses	10	20	40	50
Stores, Materials and Services	94	190	270	350
University Agreements	15	40	40	50
Total:	<u>169</u>	<u>390</u>	<u>587</u>	<u>752</u>
Staff in Post at 31st March	<u>1964</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>
Professional	40	55	70	90
Ancillary	18	55	75	100
Industrial	2	30	45	60
Total:	<u>60</u>	<u>140</u>	<u>190</u>	<u>250</u>

FUTURE NEW ACCELERATORS - SITE(S) UNKNOWN

£000

Capital

	<u>Total</u>	<u>1964/5</u>	<u>1965/6</u>	<u>1966/7</u>	<u>Later Years</u>
<u>Plant - Schemes not yet started</u> <u>£100,000 and over</u>					
Large Electrostatic Generator	2,500	5	400	740	1,355
Future Major Accelerator	16,000	-	-	-	16,000
	<u>-</u>	<u>5</u>	<u>400</u>	<u>740</u>	<u>17,355</u>

Buildings - Schemes not yet started
£100,000 and over

Large Electrostatic Generator	500	5	40	150	305
Future Major Accelerator	5,000	-	-	-	5,000
	<u>-</u>	<u>5</u>	<u>40</u>	<u>150</u>	<u>5,305</u>

Capital totals

10 440 890 -

Non-Capital

Standing Charges	-	25	70	-
Group Budgets	-	25	70	-
	<u>-</u>	<u>50</u>	<u>140</u>	<u>-</u>
<u>Total</u>	<u>10</u>	<u>500</u>	<u>1,030</u>	-

Staff in post - 31st March of year

40 60

Atlas Computer Laboratory
Summary of Estimates 1964/65, 1965/66 & 1966/67 - \$000

	<u>1963/64</u>	<u>1964/65</u>	<u>1965/66</u>	<u>1966/67</u>
<u>Capital</u>				
Schemes in Progress - Plant	750	758	649	199
(August, 1963) - Buildings	175	74		
	<u>925</u>	<u>832</u>	<u>649</u>	<u>199</u>
Schemes not yet started - Plant	5	250	250	250
(August, 1963) - Buildings	-	2	50	40
	<u>5</u>	<u>252</u>	<u>300</u>	<u>290</u>
Total Capital - Plant	755	1,008	899	449
- Buildings	175	76	50	40
	<u>930</u>	<u>1,084</u>	<u>949</u>	<u>489</u>
<u>Non-Capital</u>				
Standing Charges	119	225	321	336
Group Budgets	81	137	151	157
	<u>200</u>	<u>362</u>	<u>472</u>	<u>493</u>
Capital	930	1,084	949	489
Non-Capital	200	362	472	493
<u>A.C.L. Total</u>	<u>1,130</u>	<u>1,446</u>	<u>1,421</u>	<u>982</u>

Atlas Computer Laboratory

Capital Estimates 1964/65, 1965/66 and 1966/67 - £000

	<u>Total</u> <u>Cost</u>	<u>1963/64</u>	<u>1964/65</u>	<u>1965/66</u>	<u>1966/67</u>	<u>Later</u> <u>Years</u>	<u>Remarks</u>
<u>Buildings - Schemes in Progress</u>							
<u>£100,000 and over</u>							
Computer Building	293	175	74	-	-	-	
<u>- Schemes not yet started</u>							
<u>Under £100,000</u>							
Building Extensions	-	-	1	40	30	-	
Minor Works	-	-	1	10	10	10	
	-	-	2	50	40	-	
	-	175	76	50	40	-	

Atlas Computer LaboratoryCapital Estimates 1964/65, 1965/66 and 1966/67 - £000

	<u>Total Cost</u>	<u>1963/64</u>	<u>1964/65</u>	<u>1965/66</u>	<u>1966/67</u>	<u>Later Years</u>	<u>Remarks</u>
<u>Plant - Schemes in Progress</u>							
£100,000 and over							
Atlas Computer	3,121	750*	758*	649*	199*		
<u>Plant - Schemes not yet started</u>							
£100,000 and over							
Disc Store	200		200				
Printers	100			100			
Visual Display Unit	100			100			
Core Store	150				150		
Fixed Store	200					200	
Computer Extension	5,000					5,000	
	-	-	200	200	150		
<u>Under £100,000</u>							
Drum Store	50						
Minor Plant	-	5	50	50	50	50	
	-	5	50	50	100	-	
	-	5	250	250	250	-	

*Including development payments

ATLAS COMPUTER LABORATORYNon-Capital Estimates 1964-65, 1965-66 and 1966-67 - £000

	<u>1963-64</u>	<u>1964-65</u>	<u>1965-66</u>	<u>1966-67</u>
<u>Standing Charges - note 1</u>				
Salaries and Wages	46	62	77	82
Travel and Subsistence	2	6	7	8
Electricity, Rates, Cleaning, etc.	2	27	37	36
Computer Maintenance Contract	-	50	100	100
R.H.E.L. Overheads	69	80	100	110
	119	225	321	336
<u>Group Budgets - note 2</u>				
Operations	22	44	66	72
Programming	2	5	10	10
Mathematics	1	3	5	5
Administration	10	15	20	20
E.M.R.	6	30	50	50
A.E.A. Computer Support	40	40	-	-
	81	137	151	157
Standing Charges	119	225	321	336
Group Budgets	81	137	151	157
	200	362	472	493
<u>Staff in post at 31st March</u>				
	<u>1964</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>
Professional	13	19	23	26
Ancillary	23	27	29	31
Industrial	3	3	3	3
	39	49	55	60

Note 1. These are charges over which little or no day to day control is possible.

Note 2. These charges are under the control of group leaders.

A.C.L.

MANAGEMENT COMMITTEE ONLY

Non-Capital Estimates 1964-65, 1965-66 and 1966-67 - £000

	<u>1963-64</u>	<u>1964-65</u>	<u>1965-66</u>	<u>1966-67</u>
<u>Standing Charges</u>				
Salaries and Wages	43	57	71	75
Superannuation	3	4	5	6
Overseas Salaries	-	1	1	1
	46	62	77	82
Travel and Subsistence	2	5	6	7
F.S.A. and Air Travel	-	1	1	1
Transfer Grants	-	-	-	-
	2	6	7	8
Electricity	-	10	15	15
Rates	-	5	5	5
Advertising	2	3	3	1
Cleaning	-	3	3	4
Training	-	1	1	1
Consultants and Fees	-	5	10	10
	2	27	37	36
Computer Maintenance Contract	-	50	100	100
R.H.E.L. Overheads	69	80	100	110

THE N.I.R.N.S. PROGRAMME FOR 1964/65

INTRODUCTION

In December 1962, when the 1963/64-1967/68 Five-Year Forecast was finally revised it was still thought that the approved programme of nuclear and high energy physics at the Rutherford and Electron Laboratories could be accommodated within the "2% annual increase pattern" laid down by the Treasury, although it was clear that additional schemes would be submitted for consideration. Early in 1963 it became apparent that the approved programme would require expenditure substantially exceeding the "2% pattern".

In June, 1963, a detailed review showed that the expenditure at the Rutherford Laboratory, particularly the non-capital expenditure, had been seriously under-estimated. It became necessary to seek additional funds for 1963/64, and it was seen that the normal operation of the Rutherford Laboratory as it now exists would consume more funds in later years than had been allowed for this purpose in the Five-Year Forecast. The Minister's Office and the Treasury were at once informed and in August Ministers authorised additional funds for the Rutherford Laboratory and reaffirmed approval of the Electron Laboratory. No explicit approval of departure from the 2% pattern was given, and discussion of future years was deferred. The Minister for Science is, however, now to put before his colleagues proposals for the future consistent with the current decision.

BASIS OF THE PROGRAMME

In the circumstances described above, the Institute's programme for 1964/65 has been drawn up on a financial basis which has still to be agreed. An additional major source of uncertainty is that the date on which access to the Daresbury site can be gained is not yet known. The assumptions which have been made are:-

- (a) That at the Rutherford Laboratory, funds will allow only a "rock-bottom" programme, which can be regarded as a reasonable minimum for one year only. Those experiments which are undertaken on Nimrod will be pursued with full vigour, but their number will have to be limited to about four-sevenths of that which would be undertaken if there were no special financial restriction. Expenditure on research and development will be restricted: almost all new capital development will have to be deferred until later years.
- (b) That access to the Daresbury site will be gained soon, and that the Laboratory and accelerator are to be built as fast as possible, and completed by the end of 1966.

RUTHERFORD LABORATORY

Construction of NIMROD has been completed and only small terminal payments (£200,000) will fall in 1964/65. The allocation of effort after the completion of change from construction to use of NIMROD is very hard to foresee. Strenuous efforts will be made to keep down the complement but a net increase of 54 is forecast. The main blocks of work at the Laboratory will be:-

- (a) Development, Commissioning and Operation of NIMROD and Equipment for Use with NIMROD

This work will take up between one-third and half of the effort of the Laboratory as roughly judged by considering manpower and non-capital expenditure. Capital expenditure on schemes already

in progress will include £400,000 on the construction of bubble chambers and £500,000 on beam handling equipment.

(b) High Energy Physics Research

A limited number of experiments (chosen from those already selected with the help of the university physicists concerned) will be started in 1964/65 and given the full resources which they need. The high-energy physics experimental programme, and the development and operation of Nimrod and the beam equipment can increasingly be regarded together as the single main activity of the Laboratory.

(c) The Proton Linear Accelerator

The P.L.A. will continue to be used 24 hours a day, seven days a week for a very vigorous research programme. The P.L.A. accounts for about one-sixth of the Laboratory's effort. Improvements to Tank I, already designed, will have to be postponed owing to the financial situation, and only token provision has been made in 1964/65.

(d) Other Accelerator Developments

Work on the variable energy cyclotron for A.E.R.E. will continue. Work on the electrostatic generator for Oxford University is expected to be finished during the year, freeing some effort for redeployment.

(e) Buildings

An Electronics and Office building, deferred from 1963/64 owing to the financial situation, has had to be deferred for a further year; only token provision is made in 1964/65. Capital expenditure on building schemes under £100,000 is estimated at £230,000, about half being on schemes already in progress.

(f) Future Major Schemes

Token provision is made to make possible a start on the proposed £3m. to £4½m. scheme for a large electrostatic generator, on a site to be chosen. Future developments of this sort are subject to the decisions of Ministers on the permitted future level of effort.

ATLAS LABORATORY

Final payments on the main building and progress payments on the computer will make the total capital expenditure about £1m. The computer should be installed at the Laboratory during the year and may be in operation by the end of it.

ELECTRON LABORATORY

The programme of the Electron Laboratory is to construct a 4 GeV strong focussing electron synchrotron and the Laboratory to house it. The detailed planning of the buildings and the basic design of the synchrotron are completed. In 1964/65 construction should go ahead sufficiently for installation of the major components to begin.