1964–65–66

THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA

JOINT COMMITTEE OF PUBLIC ACCOUNTS

EIGHTY-SIXTH REPORT

AUTOMATIC DATA PROCESSING (THE BUREAU OF CENSUS AND STATISTICS NETWORK)

Presented pursuant to Statute and ordered to be printed, 26 *October* 1966

[*Cost of Paper:*—Preparation, not given; 1,567 copies; approximate cost of printing and publishing, $924]

Printed and Published for the GOVERNMENT of the COMMONWEALTH OF AUSTRALIA by
A. J. ARTHUR, Commonwealth Government Printer, Canberra
(Printed in Australia)

No. 360 [GROUP B].—20297/66.—PRICE 75c

JOINT COMMITTEE OF PUBLIC ACCOUNTS

SIXTH COMMITTEE

R. CLEAVER, Esquire, M.P. (Chairman)

J. F. COPE, Esquire, M.P. (Vice-Chairman)

Senator T. C. DRAKE-BROCKMAN[1]	J. S. COCKLE, Esquire, M.P.[3]
Senator J. F. FITZGERALD	D. E. COSTA, Esquire, M.P.[4]
Senator J. J. WEBSTER[2]	W. T. GIBBS, Esquire, M.P.[5]
Senator I. E. WEDGWOOD	P. J. Nixon, Esquire, M.P.
	L. J. REYNOLDS, Esquire, M.P.[6]
	J. C. L. SEXTON, Esquire, M.P.
	R. H. WHITTORN, Esquire, M.P.

The Senate appointed its Members of the Committee on 4 March 1964, and the House of Representatives its Members on 5 March 1964.

[1] Resigned 29 April 1965
[2] Appointed 29 April 1965
[3] Deceased 3 August 1966
[4] Resigned 23 March 1966
[5] Appointed 24 August 1966
[6] Appointed 23 March 1966

DUTIES OF THE COMMITTEE

Section 8 of the *Public Accounts Committee Act* 1951–1965 reads as follows:

8. The duties of the Committee are—

(*a*) to examine the accounts of the receipts and expenditure of the Commonwealth and each statement and report transmitted to the Houses of Parliament by the Auditor-General in pursuance of sub-section (1.) of section fifty-three of the *Audit Act* 1901–1950;

(*b*) to report to both Houses of the Parliament, with such comment as it thinks fit, any items or matters in those accounts, statements and reports, or any circumstances connected with them, to which the Committee is of the opinion that the attention of the Parliament should be directed;

(*c*) to report to both Houses of the Parliament any alteration which the Committee thinks desirable in the form of the public accounts or in the method of keeping them, or in the mode of receipt, control, issue or payment of public moneys; and

(*d*) to inquire into any question in connection with the public accounts which is referred to it by either House of the Parliament, and to report to that House upon that question,

and include such other duties as are assigned to the Committee by Joint Standing Orders approved by both Houses of the Parliament.

TABLE OF CONTENTS

JOINT COMMITTEE OF PUBLIC ACCOUNTS

EIGHTY-SIXTH REPORT

AUTOMATIC DATA PROCESSING

(The Bureau of Census and Statistics Network)

CHAPTER 1—INTRODUCTION

In Chapter 1 of its Eighty-fifth Report Your Committee outlined the reasons which had prompted it to embark upon a broad Inquiry into Automatic Data Processing. In determining the scope of its inquiry Your Committee considered that detailed examinations should be made of each computer network installed in Commonwealth departments. In reaching this decision, however, it recognised that it would not be possible for this task to be completed during 1966 but considered that the inquiry should be taken to the stage where a detailed examination had been made of one large departmental network. As the information available to Your Committee showed that the network installed by the Bureau of Census and Statistics is the most significant in terms of capital cost, that network was selected for examination.

2. For reasons set out in Chapter 1 of our Eighty-fifth Report, the present Report relates to the computer network installed by the Bureau of Census and Statistics and includes relevant evidence submitted by such organisations as the Department of the Treasury, the Taxation Branch, the Superannuation Board, the Defence Forces Retirement Benefits Board and the Department of Health which are currently using the Bureau's network.

3. Your Committee's approach to its specific examination of the Bureau's Computer network was based primarily on the more important general issues which were discussed at length in our Eighty-fifth Report and where relevant, the particular features of the Bureau's network are related to the conclusions set out in Chapter 6 of that Report.

4. Written statements submitted by witnesses relevant to the Bureau of Census and Statistics computer network were made the subject of public inquiry held at Parliament House, Canberra, on:

Thursday, 28 July 1966
Tuesday, 9 August 1966
Wednesday, 10 August 1966

5. The following witnesses, in order of appearance, were sworn and examined by Your Committee, for the purposes of this phase of the Inquiry:

Mr W. T. Gleeson	..	First Assistant Commissioner, Management Services Division, Commonwealth Public Service Board.
Mr J. Shaw ..	..	Assistant Commissioner, Management Services Division, Commonwealth Public Service Board.
Mr W. Grant ..	..	First Assistant Commissioner, Management Service Division, Taxation Branch, Department of the Treasury.
Mr K. F. A. Myers	..	Assistant Commissioner, Management Services Division, Taxation Branch, Department of the Treasury.
Mr R. H. Searle	..	Director, A.D.P. Section, Establishment and Finance Branch, Department of Health.
Mr L. B. Holgate	..	Director, Finance Section, Establishment and Finance Branch, Department of Health.
Mr L. D. Read ..	..	Chief Finance Officer, Budget and Accounting Branch, Department of the Treasury.
Mr L. K. Burgess	..	President of the Commonwealth Superannuation Board and Chairman of the Defence Forces Retirement Benefits Board.

Mr H. D. Pridmore	..	Assistant Statistician, Commonwealth Bureau of Census and Statistics.
Mr S. Burton ..	..	Director, Applications Division, Commonwealth Bureau of Census and Statistics.
Mr K. McR. Archer	..	Commonwealth Statistician, Commonwealth Bureau of Census and Statistics.

6. During its inquiry Your Committee was assisted by the following Observers:

Audit Office ..	..	Mr J. K. Lawrence
		Mr A. K. Ragless
Public Service Board	..	Mr F. C. Nordeck, O.B.E.
		Mr G. N. Vanthoff
Department of the Treasury		Mr M. G. Cowie

7. On Monday, 26 September, Your Committee carried out an inspection of the A.D.P. equipment installed by the Bureau of Census and Statistics.

CHAPTER 2—THE BUREAU OF CENSUS AND STATISTICS

(i) Historical Background

8. The Commonwealth Bureau of Census and Statistics commenced its evaluation of automatic data processing by sending a senior officer to the United States of America to study computing methods and techniques in the U.S. Bureau of Census in Washington. This study, which was supplemented by investigation of similar systems in Britain and Canada, was undertaken during 1958-59. Referring to the need to examine procedures under operational conditions in other countries, Mr Pridmore expressed the view that the preliminary studies had materially assisted the introduction of similar procedures in the Commonwealth Bureau.

Exhibit 86/14.

Q. 1483.

9. During the period 1960-62 the Bureau completed a detailed analysis of potential use of A.D.P. equipment in the compilation of statistics. Reports on these feasibility studies were reviewed by the Public Service Board and the Inter-departmental Committee on A.D.P. in May 1962 and the Bureau then commenced drafting a hardware specification. The Treasurer's approval of the Bureau's proposals to establish a large scale computer network was obtained in August 1962 and specifications were then formally issued by the Commonwealth Stores Supply and Tender Board. A contract for the supply of the equipment and support facilities was let in June 1963, and the first of the six installations was accepted in December 1964.

Q. 1493.
Exhibit 86/14.

Q. 1493.

Exhibit 86/14.

10. The network consists of a large scale installation in Canberra and five smaller configurations in all State capitals except Hobart. The installations are not linked by any form of data transmission equipment, although this possibility was envisaged when the specifications were issued. We were informed that the whole question of data links was carefully examined by officers of the Bureau and the Public Service Board during 1963 and, for various economic and technical reasons prevailing at the time, it was decided not to proceed with the installation of this facility.

Q. 1531.

Exhibit 86/14.

Q. 1494.

11. The capacity of the various installations, particularly those in Sydney and Melbourne, was expanded early in 1966 and we were informed by Mr Pridmore that the necessity to expand these installations was due mainly to the speed of implementation of much of the work. Additionally, precise requirements of the departments intending to utilise the Bureau's A.D.P. facilities could not reasonably be anticipated at the time the original contract was let. Consequently, the Bureau sought to avoid the possibility of idle capacity in its State installations by establishing relatively small configurations capable of expansion as required. He pointed out that the proposals to exand the State installations were examined and approved by the Management Services Division of the Public Service Board and the Inter-departmental Committee on A.D.P.

12. The Central Processing Units (as distinct from such ancillary items as high speed printers, card readers, paper tape readers, which may vary in accordance with requirements) installed at the various sites as at July 1966 were as follows:

Exhibit 86/14.

TABLE No. 1

BUREAU OF CENSUS AND STATISTICS

Central Processing Units

Location	Description of Unit
Canberra	Control Data 3600/Control Data 3300
Sydney	Control Data 3200/Control Data 160A
Melbourne ..	Control Data 3200/Control Data 160A
Brisbane	Control Data 3200
Adelaide	Control Data 3200
Perth	Control Data 3200

13. It was indicated that this is the largest complex of computer installations in Australia. In this connection, Mr Pridmore cited the May 1966 issue of the publication 'Computers and Automation' as authority for the assessment that about 90 per cent of the computers either installed or on order in the United States of America are less powerful than the 3200 equipment and approximately 96 per cent are less powerful than the 3600 machines. Q. 1590. Q. 1449.

(ii) DEVELOPMENT AND IMPLEMENTATION

14. According to the Bureau's formal submission, the practicability of using computers for statistical and administrative data processing had been amply demonstrated by the U.S. Bureau of the Census. Consequently, an exploratory study, i.e. a study to determine the need to proceed with a feasibility study, was not undertaken. However, a feasibility study relating to the particular procedures which the Bureau considered were suitable for conversion to automatic processing was undertaken between June 1960 and May 1962. This work, which involved between five and eight officers and cost $61,600, provided both the basis for subsequent detail systems design and the necessary material for drafting the equipment specification. Exhibit 86/14. Q. 1571.

15. The general approach to implementation of A.D.P. in the Bureau was influenced by the need to dispense with hired punched card equipment as soon as possible. We were informed that the Bureau had operated a large scale punched card installation for 30 years prior to the introduction of A.D.P. and, with some minor exceptions, the whole of this equipment was on hire. At the time the computers were delivered, the total annual cost of hiring punched card equipment was $317,000. More than two-thirds of this amount ($257,000) related to the hire of punched card equipment located in the Bureau's Canberra installation and it was in this area that the most significant savings from the use of computers was envisaged and has, in fact, been effected. In this connection, the Bureau expects to have terminated the hire of 53 machines at its Canberra installation by October 1966, representing an annual reduction in rental of $155,000. Exhibit 86/14. Q. 1517. Q. 1520. Q. 1641. Ibid. Exhibit 86/14.

16. As indicated in our Eighty-fifth Report the method and rate of implementation of A.D.P. may vary with each particular application. Reduced to basic concepts, however, it appears that there are two distinct methods of implementation of a total or integrated systems approach: Q. 1504.

- The simultaneous implementation approach; or
- The 'progressive implementation' approach. Q. 1511.

The former connotes, in general, a deferment of operational running until all components of an integrated system have been designed are programmed. The alternative is to segment the system to permit progressive implementation. In the case of the Bureau of Census and Statistics, the release of hired punched card machines represented one of the main considerations. Consequently, the simultaneous approach to implementation was clearly inappropriate. The Bureau has demonstrated, however, that the compilation of various types of statistics is readily divisible into separate and, in some instances, unrelated projects. The success of this approach to implementation was said to be evidenced by the fact that 41 applications had reached operational status within two and a half years of acceptance of the first installation. Exhibit 86/14.

Q. 1510. 17. We were informed that the Bureau envisages that the practical experience gained from the progressive implementation of a wide variety of work will lead to the creation of integrated systems of even greater value. Questioned as to whether or not the Bureau's Q. 1504. achievements to date could be expressed as a percentage of the total conversion proposals, Q. 1505. Mr Pridmore pointed out that the compilation of statistics differs from other data processing tasks in that basic requirements are subject to continual change. Since the degree of frequency of change over a given period of time could not be predicted with accuracy, he expressed the view that it would be very difficult to give a percentage of total work to be undertaken. On the question of integrated systems generally, he contended that these can be implemented progressively, and in his opinion this approach is preferable to Q.'s 1510 and 1511. introducing a whole manual system simultaneously.

(iii) Management Structure

Q. 1583. 18. In response to a question as to the designation of the highest level officer in the Bureau whose responsibilties are wholly involved with A.D.P. systems, Mr Pridmore informed us that the Assistant Statistician (A.D.P.) is the officer concerned.

(iv) Management Training

19. In Chapter 4 of our Eighty-fifth Report, it was indicated that the introduction of A.D.P. is facilitated if the administrative executives concerned are conversant with the Q. 1515. technicalities, problems and complexities of computer techniques. We sought Mr Pridmore's comments on this proposition generally and particularly on the advantages that appeared to be attributable to the professional qualifications held by senior officers of the Bureau. He doubted whether a qualified statistician was necessarily better equipped to direct the implementation of A.D.P. but stressed that in the case of the Bureau, the present Commonwealth Statistician (Mr Archer) had not only acquired extensive knowledge of A.D.P. personally but had directed his senior officers to undergo courses of training in this field. He expressed the view that it is incumbent on anyone who is associated with management to know as much as possible about A.D.P.

Q. 1604. 20. Commenting on management training generally, Mr Archer referred to a tendency he had observed overseas for subject-matter staff to leave questions relating to A.D.P. to specialists in that field. He indicated that, in his view, this attitude detracts from overall efficiency and consequently he instituted training courses in A.D.P. for all of his senior officers down to branch supervisor level. He instanced the 1966 census as a clear example of the benefits attributable to this policy and suggested that the use of computers for this work would not have been possible without complete understanding between the subject-matter branch and the A.D.P. Division.

(v) Staff Recruitment and Training

21. As indicated in our Eighty-fifth Report, most witnesses placed considerable emphasis on the difficulties stemming directly and indirectly from the prevailing shortage of experienced A.D.P. personnel in Australia. In this regard Mr Pridmore stated that it had been the policy of the Bureau to seek proficiency and experience rather than numbers. He explained that the programmer-in-training courses being conducted by the Bureau were Q. 1415 and Exhibit 86/14. designed to provide a continuing supply of trained personnel, with the ultimate objective of becoming self-sufficient in this respect. He considers that his organisation has now reached that position, having trained 139 programmers and 79 computer operators and provided a Q.'s 1412 and 1414. number of other specialised courses. He added that it was anticipated from the outset, however, that it would be necessary to recruit experienced staff from overseas during the first 3 to 4 years of the Bureau's A.D.P. operations and this probability has in fact Exhibit 86/14. eventuated. A total of forty-one experienced officers were recruited in the United Kingdom Q. 1423. at a cost to the Commonwealth of approximately $88,000. Mr Pridmore agreed that while this was a costly method of obtaining staff, the Bureau could not otherwise have reached its present level of achievement. He expressed the view that the growth of knowledge and experience in Australia has now reached the point where the need to recruit staff overseas has been substantially reduced.

Exhibit 86/14 and Q. 1419. Q. 1420. 22. Referring to the resignation of 12 of the 41 officers recruited in the United Kingdom, Mr Pridmore informed us that inadequate salary and, to a lesser extent, lack of Q. 1421. opportunities for promotion were the main factors which influenced these officers to accept Q. 1469. employment in various private enterprise organisations. He added, however, that during the last two years the salaries of programmers in the Commonwealth Service have been reviewed and now compare reasonably well with those available in private enterprise.

(vii) Capital and Operating Costs

23. Capital expenditure on the Bureau's network as at 30 June 1966 amounted to $6,394,600, details of which are shown in Table No. 2. An additional amount of $473,500 was approved but not expended at that date. Exhibit 86/14.

TABLE No. 2

Bureau of Census and Statistics—Capital Expenditure on A.D.P.

(To 30 June 1966)

Item	Expenditure
	$
Central Processing unit and ancillary equipment ..	5,264,300
Data Preparation equipment	223,600
Construction and modification of buildings ..	799,200
Other capital costs (e.g. paper handling equipment, tape winders, etc.)	107,500
Total	6,394,600

TABLE No. 3

Bureau of Census and Statistics—Operating Costs Including Feasibility Study Costs

(To 30 June 1966)

Item	Expenditure
	$
Maintenance—central processing unit and ancillary equipment	312,100
Maintenance—buildings including air conditioning(*a*)	7,000
Hiring/rental charges—central processing unit and ancillary equipment	38,400
Hiring/rental charges—data preparation equipment	220,600
Hiring/rental charges—buildings	17,100
Salaries and wages(*a*)	1,513,000
Power(*a*)	40,000
Incidentals (e.g. magnetic tape, paper tape, punched cards, stationery)	415,700
Total	2,563,900

(*a*) Estimated.

24. In our Eighty-fifth Report we referred to the views of several witnesses relative to the economic implications of hiring rather than purchasing the central processing unit and ancillary equipment. As it seemed that different considerations may attach to the use of data preparation equipment, we sought further information from Messrs Archer and Pridmore on this issue. Mr Pridmore stated that there have been prognostications of major developments in data preparation techniques during the past ten years but none has yet come to fruition. He stated that in the past twelve months, however, there have been considerable advances in the development of document reading equipment which involves the use of optical scanning techniques. Nevertheless, he indicated that technological problems associated with the use of such equipment to read handwritten documents would probably take 10 years to overcome. He then explained that, apart from the possibility of major developments, data preparation equipment is subject to fairly rapid changes in certain minor respects, e.g. modifications which improve performance and the direct relationship between usage and deterioration. These factors, when added to the possibility that new developments could render existing data preparation techniques obsolete, constitute the basis of what he regards to be a well established and well founded policy of the Bureau to hire data preparation equipment rather than to purchase. Mr Archer supported this view and added that, whilst it may be preferable to purchase rather than to hire computers and ancillary equipment, this did not apply to data preparation equipment generally, and in particular to some data preparation equipment used in connection with census work. Q. 1566. Q. 1568. Q. 1608. Q. 1609. Q. 1610. Q. 1611.

(vii) Benefits and Advantages Attributable to the Use of A.D.P.

Q. 1582. 25. Mr Pridmore expressed the view that the most important intangible benefit that may be attributable to the use of A.D.P. in the Bureau is improved service to users of statistics. He referred to the wide use of statistics in Government, commerce and industry and pointed out that the advanced timeliness and greater accuracy of statistical data made possible by computer techniques represented a major improvement in the service provided by the Bureau.

Q. 1603. 26. Questioned as to the assessment of tangible benefits, Mr Archer expressed the view that the ability to undertake tasks that were beyond the capacity of the older type equipment was the most significant benefit directly attributable to A.D.P.

Q.'s 1513 and 1561. 27. Referring to the difficulties associated with the precise measurement of direct and indirect savings from the use of computers, Mr Pridmore expressed the view that management control of the Bureau network included procedures whereby all processing carried out Exhibit 86/14. at the various installations is accurately costed in terms of computer time. He considered that, if necessary, this scheme could be expanded to include all indirect labour and overhead Q. 1561. costs if complete project costing was to be implemented. Table No. 4 below summarises the utilisation of the Bureau's computers.

TABLE No. 4

Bureau of Census and Statistics, Total Computer Usage to 31 May 1966

(Hours)

User	Canberra		Sydney 3200 Type Computer	Melbourne 3200 Type Computer	Adelaide 3200 Type Computer	Total
	3600 Type Computer	3300 Type Computer				
C.B.C.S.	6,362	4,889	1,349	998	881	14,479
Health	997	829	257	..	98	2,181
Treasury	956	748	555	19	..	2,278
Taxation	65	496	496	424	809	2,290
Superannuation Board	491	306	8	27	24	856
Supply	..	..	..	55	..	55
Public Service Board	..	..	..	14	..	14
Civil Aviation	..	..	..	47	..	47
Repatriation	..	..	..	10	..	10
Control Data	76	96	..	..	..	172
Other	29	18	..	2	..	49
Total	8,976	7,382	2,665	1,596	1,812	22,431

Q. 1563. 28. Regarding actual savings that had been effected by the Bureau since the introduction of A.D.P., Mr Pridmore stated that there has been an annual saving of $155,000 in the cost of hiring punched card equipment, to which can be added approximately $80,000 per annum for staff who formerly operated that equipment. He also instanced a particular application in which another nine officers (whose annual salaries amounted to approximately $30,000) were available for other duties. In response to the requirements of private industry, the system has also enabled the Bureau to provide an information service which involves payments to the Commonwealth of approximately $30,000 per annum. This indirect benefit is not gained immediately by the Bureau but has resulted in a saving to the Commonwealth. He also pointed out that the Bureau's installation provides information for the Department of Trade on an analysis of overseas shipping which that Department uses in negotiations. This information was said to permit the negotiation of favourable terms which resulted in substantial additional savings to the Commonwealth. He concluded his outline of the tangible benefits of A.D.P. by informing us that there had been a relative reduction in the number of temporary employees engaged for the most recent population census. However, he was unable to assess in monetary terms, the savings attributable to the reduction. Mr Archer estimated this saving to be in the vicinity of forty clerical staff.

(viii) Administration Arrangements with User Organisations

29. Apart from the programme development and production running associated with the compilation of statistics, the Bureau provides computing facilities for the following departments and branches:

Department of Health Exhibit 86/14.
Department of the Treasury (Budget and Accounting Branch)
Department of the Treasury (Taxation Branch)
Department of the Treasury (Superannuation Board) (Defence Forces Retirement Benefits Board)
Department of Supply
Department of Civil Aviation
Repatriation Department
Public Service Board.

30. As indicated earlier in Table No. 4 the network was in operation for 22,431 hours up to 31 May 1966, of which Bureau applications and systems development occupied 14,479 hours. The remaining time (7,952 hours) was utilised by client departments for developmental and production running.

31. It was stated that the existing arrangements, which were envisaged in concept when the hardware specification was drafted, involved the allocation of computer time based on negotiations between the Bureau and users. In practice, however, the Bureau provides the computer and its ancillary equipment, operating staff, magnetic tape library and handling facilities and miscellaneous consumable items such as magnetic tapes, standard stationery, paper tape, punched cards, inking ribbons, etc. The client departments are responsible for systems design, data preparation and, where accountable stationery is used, paper handling facilities.

32. To illustrate the relationship between the Bureau and its clients, Mr Pridmore explained that the Bureau allots blocks of time as negotiated with clients and, provided there is no idle capacity or obvious waste of time, the Bureau has no jurisdiction over the use made of the time allocated. Responsibility for proper use of the equipment and accounting responsibility generally remains with the permanent head of the client department. In response to a question relating to the use of allocated computer time, Mr Archer replied that he was not in a position to give any assurance that the machines were at all times being utilised to optimum efficiency by client departments. He expressed the view that lack of knowledge in some cases of what was actually being processed by user departments suggested that, in this respect, the Bureau's system of records is not as complete as it might be. Mr Pridmore pointed out, however, that, in his opinion, departments would not deliberately waste time on such costly equipment. He indicated that there is a practical arrangement with client departments whereby the Bureau offers advice concerning methods of improving systems and programming efficiency. Q. 1455. Q. 1462. Q. 1463. Q. 1596. Q. 1479.

33. He informed us that scheduling problems involving the fixing of priorities had to be resolved especially during the initial stages of production running. This is materially assisted by the co-operation between the parties concerned and, in this connection, he indicated that so far the Bureau has succeeded in meeting all target dates set by client departments. He admitted, however, that a situation in which two or more departments were to claim equal priority for urgent processing had not yet arisen. He indicated that this was related to the fact that there is a clear understanding as to the time of the day and the duration of each allocated block of time. Client departments arrange their processing accordingly. He informed us that in those instances where there has been an urgent unexpected requirement by a user, such situations normally involve less than one hour of computing time and have been accommodated by rearrangement of the Bureau's own production running. In normal circumstances, client departments are in a position to notify the Bureau up to three months in advance of any significant variation in their requirements. Q. 1455. Q. 1456. Q. 1459. Q. 1468.

34. Mr Hill, the Department of the Treasury witness, suggested that a 'Users Committee' to advise the Bureau on the allocation of time might be preferable to the existing practice of bilateral consultation. He suggested that all users should have a representative on the Committee, but stressed that it should function in an advisory capacity only, the final decision being taken by a single authority. In this context he envisaged that, if the Bureau were bound by decisions (which may not necessarily be unanimous) of such a Committee, this might prove to be unsatisfactory from a management point of view. In commenting on Mr Hill's proposed 'Users Committee', Mr Pridmore indicated that a proposal along these lines is currently under consideration and that within the next two months the Bureau intends convening a conference of users to examine the whole question of computer capacity in relation to projected departmental requirements. He pointed out that this conference, in common with all other major decisions concerning utilisation of the network, would involve consultation with the Management Services Division of the Public Service Board. Q. 1332. Q. 1333. Q. 1457.

(ix) Future Development of the Network

35. We were advised that, at July 1966, the Bureau's installations were being operated
Exhibit 86/14. on a five-day week basis on the following shift arrangement:

TABLE No. 5

Bureau of Census and Statistics—

Computer Shift Arrangements

(As at July 1966)

Location	Type of Computer	Number of Shifts
Canberra	3600/3300	3
Sydney	3200/160A	3
Melbourne	3200/160A	2
Brisbane	3200	1
Adelaide	3200	2
Perth	3200	1 (*a*)

(*a*) As from August 1966.

36. The Bureau estimated that, by December 1966, three shifts will be worked on its computers located in Melbourne and two in Brisbane and Perth. The three shift operation comprises between 20 and 22 hours work per day and the two shift operation between 14 and 16 hours. Preventive maintenance per day is scheduled at four hours but with three shifts working this is sometimes reduced, by arrangement with the manufacturers, to two with at least ten hours during weekends to bring total maintenance time to a minuimum of twenty hours per week.

Q. 1457. 37. When asked whether the Bureau would be capable of meeting the demands of client departments in the near future, Mr Pridmore informed us that, up to the present time, the
Q. 1507. Bureau had met all requirements of all users. As to future requirements, however, he stated that some users had not been able to assess with sufficient accuracy their requirement projections for the ensuing year. He indicated that these problems would be examined in detail at a proposed conference of users to be convened within two months, i.e. by October 1966.

Q. 1508. 38. Mr Pridmore stressed that although the Bureau was meeting clients' requirements
Q. 1506. at the present time, this may not be possible by the end of 1967. The probable extension of existing applications within the Bureau itself would reduce the computer time available to users, quite apart from the likelihood of increased demands by user departments. Mr Archer informed us that it was originally envisaged that the basic hardware would continue in use at
Q. 1630. least in 1969 and 1970 and he felt generally that this estimate would be substantially correct. He pointed out, however, that although the network had not yet reached total capacity, more rapid progress had been made in the implementation of systems than was originally anticipated.
Q. 1629. He stated that if applications continue to exceed those anticipated when the equipment was ordered, some additions to the existing equipment will be necessary to cope with extended workloads.

39. Prior to hearing evidence from representatives of the Commonwealth Bureau of
Q. 881. Census and Statistics, Mr Gleeson's views were sought on the existing arrangements for the joint use of C.I.R.O. and Bureau of Census and Statistics A.D.P. equipment and the extent to which the Public Service Board had examined possible future developments. Mr Gleeson
Q. 882. expressed the opinion that the joint use of A.D.P. equipment had operated satisfactorily and, in the short term, he expected that the organisations now using these two networks will continue to do so. He indicated that, in making forward assessments in the A.D.P. field, the needs of the first two or three years can be assessed with reasonable confidence but those of subsequent years can only be assessed with diminishing accuracy. He informed us, however, that a detailed examination of long-term proposals is to be undertaken by the Public Service Board in the near future. This would involve inter-departmental consultations designed to determine whether additional installations should be established or existing facilities, such as the Bureau network, should be extended.

40. Mr Gleeson referred also to a third proposal which has already been the subject of
Q. 882. preliminary discussion. This is the establishment of a separate 'Bureau of Information processing' which could possibly provide computing facilities for a group of departments that

do not at present have their own A.D.P. equipment. He stressed that such a proposal did not imply that further installations would not be established, e.g., the Postmaster-General's Department, the Bureau of Meteorology, the Weapons Research Establishment and the C.S.I.R.O. would continue to operate their own installations if a Bureau of Information Processing were established.

41. Mr Pridmore's assessment of the available alternatives for future development was substantially in accordance with the views expressed by Mr Gleeson. He stated that there are three basic approaches. The first and, in his view, the simplest in concept is to establish large numbers of computer installations. The alternative to this is the establishment of a number of much larger installations on a regional basis. The third approach is to establish a complex of very large scale computing centres operating as Service Bureaux for Commonwealth Departments generally. In another context he stated that he advocates the use of large scale machines and added that the cost of operating a computer installation does not increase in direct proportion to its actual computing capacity. Q. 1536. Q.'s 1483 and 1580.

42. Questioned as to his views on Mr Gleeson's reference to a proposed Bureau of Information Processing, Mr Pridmore informed us that he had directed his attention to this proposition and had, in fact, prepared a paper on this subject in April, 1966. A copy of that paper was submitted to us for information. Q. 1569.

CHAPTER 3—THE DEPARTMENT OF THE TREASURY

(i) Historical Background

43. The Department of the Treasury is directly concerned with the development of automatic data processing in the Commonwealth Service in two different capacities. Firstly, it is the department which controls accounting practices and procedures of all Commonwealth Departments and secondly, it is in the course of converting some of its own accounting procedures to A.D.P. The role of the Department of the Treasury in relation to the use of A.D.P. by departments generally has been dealt with in Chapter 5 of our Eighty-fifth Report. We have therefore directed our attention in this section of the present Report to the specific A.D.P. applications that have been developed or are being developed by the Budget and Accounting Branch of the Department. Exhibit 86/8.

44. The Treasury A.D.P. section was formed just over two years ago by the recruitment of four experienced A.D.P. officers from Britain and some officers with specialised knowledge of Treasury accounting. Since then, progress has been made in converting existing punched card and other systems to the Bureau's computer. Despite a continuing shortage of fully trained staff, the A.D.P. section has been able to meet the essential requirements of the Department and significant elements of Treasury accounting work in Canberra, Sydney and Melbourne are now being processed by computers. Exhibit 86/12.

45. Mr Hill informed us that the close relationship between the Budget and Accounting Branch of the Department and the Bureau of Census and Statistics stems from the fact that the latter is itself a branch of the Treasury and that traditionally, over the years, the central Treasury accounting operations have been processed on the Bureau's punched card equipment. Secondly, the use of the Bureau's computer installations by the Budget and Accounting Branch was simply an appropriate continuation of an established practice. Mr Hill added that accounting requirements of the Treasury were taken into serious consideration in determining the extent of equipment to be acquired by the Bureau. Q. 1319.

46. Questioned as to whether or not systems should be designed prior to the installation of computers, Mr Harris stated that this was the ideal approach. He expressed the view that a great deal of systems analysis should be undertaken on major tasks designed for a particular computer installation before tenders are called. He added that this was, in fact, done in respect of the major Treasury applications before the specification for the Bureau's network was drawn up. Q. 677.

(ii) Development and Implementation

47. Exploratory and feasibility studies of the various Treasury operations were made and incorporated in the feasibility study undertaken by the Bureau of Census and Statistics. Exhibit 86/12.

Q. 692. 48. Mr Harris informed us that, within the Budget and Accounting Branch, proposals for the conversion of specific manual accounting procedures to A.D.P., will be implemented over a period of approximately 2 years. He stated that, of the priority projects that were Q. 691. Q. 783. under immediate consideration, 13 per cent is now in full operation. He stressed that this did not imply that the two-year implementation schedule represented the whole of Treasury's Q. 692. plans for the use of A.D.P. Work will be commenced on the conversion of other procedures as soon as the current projects have reached a reasonable stage in their development.

Q. 694. 49. Mr Harris made it clear that the Department of the Treasury was fully cognisant of the Bureau's desire to terminate the hire of punched card equipment. He added, however, that there is still some Treasury work being processed on the punched card equipment in Canberra and efforts are being directed towards transferring it to the computer as soon as possible.

50. The status of Treasury A.D.P. applications developed or in course of development at 30 June 1966 may be summarised as follows:

Exhibit 86/12.

Project	*Operational Date*
New South Wales Salaries (progressive implementation)	May 1966 (2,400 staff)
Pension payments (Superannuation Board, D.F.R.B.) (T.P. & N.G., etc.)	March 1967
A.C.T. Salaries	October 1965
Sub-Treasury Cheque Production	March 1966
Reconciliation of Drawing Accounts (progressive implementation)	July 1966 (Taxation Branch only)
State Appropriation/Revenue Ledgers	New South Wales—February 1966 Queensland—September 1966 Victoria—December 1966 South Australia—March 1967 Western Australia—July 1967
Provident Fund Quinquennial Surplus	November 1965
Canberra Appropriation/Revenue Ledger	July 1967
Central Treasury and Sub-Treasury Ledgers	July 1965
Salaries Accounting	Victoria—March 1967 South Australia—April 1967 New South Wales—May 1967 Queensland—July 1967 Western Australia—October 1967

Exhibit 86/15. 51. In the summary referred to above, two separate applications are listed in relation to the processing of New South Wales salaries. To meet a specific problem associated with clerical workloads in that State, a system was devised to process the existing payroll of the Sub-Treasury, Sydney, on the C.D.C. 3600 computer in Canberra. Approximately 2,400 employees are now paid by this system and the New South Wales Sub-Treasury payroll of 8,600 will be fully transferred by November 1966. This system will be returned to Sydney in May 1967 for processing on the local C.D.C. 3200 computer when the design of a system for that computer is completed.

Exhibit 86/15. 52. The Department also furnished the following additional information on the development and present status of some of its larger applications:

Appropriation Ledgers

53. The Appropriation Ledger is required to be kept by an Authorising Officer to analyse expenditure under items of appropriation.

Q. 690. Q. 777. 54. The Sub-Treasuries have traditionally provided an Appropriation Ledger service to small departmental branches where the workload did not justify the establishment of a departmental accounts office. In these cases, it has been the practice to appoint the Sub-Treasury Authorising Officer to authorise the payment of departmental accounts. However, in the main, for reasons associated with the volume of book-keeping, the actual work of keeping an Appropriation Ledger has devolved upon each department for whom an Authorising Officer has been appointed.

55. The Sub-Treasury Canberra Appropriation Ledger was converted to punched cards in March 1959, using equipment installed and operated by the Bureau of Census and Statistics. The system was further developed in July 1962 as a centralised processing system on which the Appropriation Ledgers of other Canberra Authorising Officers were processed without impairing in any way the exercise of the Authorising Officer's responsibility for the control of funds.

56. In May 1963, a further development was introduced in Sydney using the National Elliot 405 Computer Service Bureau. This system produced the Sub-Treasury Sydney Appropriation Ledger using as input, paper tapes produced by Flexowriters substantially as a by-product of the cheque-writing process. The system functioned successfully until 1st February 1966 when it was replaced by a system designed by the Department of the Treasury for the Bureau's C.D.C. 3200 computer.

Sub-Treasury Ledgers

57. The Sub-Treasury Ledger records the analysis of receipts and expenditure of all departments operating in the State or Territory in which it is located. Prior to 1961, a ledger was maintained in each Sub-Treasury by conventional accounting heads, the transactions of all departments serviced by that Sub-Treasury. This ledger formed the link between the transactions recorded in departmental ledgers (Appropriation Ledgers) and the Central Treasury Ledger in Canberra. In January 1961, the processing of the Sydney Sub-Treasury Ledger was undertaken on the National Elliot 405 Computer Service Bureau. Accounting data was punched on paper tape which was then processed by this computer over approximately 1,500 ledger headings. Statements were printed out daily and monthly. From the monthly statement a paper tape was prepared for transmission of the monthly balances to the Central Treasury by means of a teleprinter. This system continued until May 1964, when centralised processing of all Sub-Treasury Ledgers was undertaken in Canberra. In July 1965 processing in Canberra was transferred to the Bureau's C.D.C. 3600 computer using as input the paper tape from the teleprinter transmissions. Q. 1308.

Central Ledger

58. The Central Treasury Ledger records on a master ledger basis the receipts and expenditure of all Commonwealth Departments as reported by each Sub-Treasury. Prior to 1958, the Central Treasury Ledger was maintained by conventional accounting machine equipment, being posted each month from the monthly trial balances of the Sub-Treasury Ledgers. In August 1958, the Central Ledger was transferred to the Bureau's punched card equipment and in July 1965, in accordance with planned development, was transferred to the C.D.C. 3600 computer. This system now produces immediately after the close of each month the following information: Q. 1326.

- Central ledger balances in sub-divisions of appropriations and major Revenue, Trust and Loan Fund headings;
- The statement required to be published by the Treasurer under section 49 (1) of the *Audit Act* 1901-1965;
- An analysis of the transactions of the Trust Fund;
- A National Income Accounting statement;
- Miscellaneous extracts in statement form for various Treasury branches;
- An abstract of receipts and expenditure by departments;
- The Public Ledger; and
- A detailed statement at 30th June of the year's transactions. This was formerly known as the Annual Trial Balance.

Reconciliation of Drawing Accounts

59. Apart from the Treasury and the Postmaster-General's Department, only departments having a need to issue large volumes of cheques for special purposes operate drawing accounts. Due to the volume of cheques issued certain of these accounts are not fully reconciled. However, the introduction of magnetic ink character recognition equipment which can be used in conjunction with computers enabled the Department of the Treasury to arrange with the Reserve Bank of Australia early in 1964 for the centralisation of paid cheque processing in Sydney and Melbourne. The Department has established reconciliation centres at the Sub-Treasuries in those cities. The function of these centres will be to prove the correctness of the claims made each day against the Commonwealth by the Reserve Bank for the payment of Drawing Account cheques and to match paid cheques against the records of issue as a precaution against fraud. Q. 778. Q. 1340. Q. 780.

60. Information will be provided to Authorising Officers to enable ready reconciliation of the balances in the Drawing Accounts with bank records. An essential feature of the system is the necessity to re-domicile Drawing Accounts previously located in other capital cities and Darwin in Sydney and Melbourne. The reconciliation system is now operational to a limited degree and its first task will be to reconcile the new Drawing Account operated on by the Taxation Branch for the issue of refund cheques by computer process with effect from 1 July 1966.

Q. 731. 61. We sought Mr Harris' views on sections of a paper prepared by the Government Accountants Group of the Victorian Division of the Australian Society of Accountants in which it was suggested that A.D.P. accounting procedures may not comply with specific requirements of existing legislation. As a possible consequence it was inferred that legislative constraints which should, perhaps, be treated as obsolete and amended accordingly, may be incorporated in systems design. Mr Harris stated that, in general, Treasury A.D.P. systems were designed to comply with existing legislation. He conceded that more efficient systems could possibly be devised in respect of some procedures if some modification were made to the Audit Act or Treasury Regulations but that, so far, legislative constraints on the development of A.D.P. were only marginal. He felt that the Department of the Treasury had been able to develop satisfactory A.D.P. systems without amending the requirements of the law.

62. Mr Harris cited two examples to illustrate what he regarded as marginal issues. First, he instanced the present requirements of the Audit Act in respect of salary and personal history records and suggested that it may be advantageous to co-ordinate these in an A.D.P. environment by amending the Audit Act, the Public Service Act and the Superannuation Act. Secondly, he cited Treasury Regulation 109 which requires a Paymaster to ascertain the correctness of cheques that he draws by comparing them with the account that was received and certified by a Certifying Officer. He felt that in some cases, for example, Social Service pensions, where repetitive payments are made by computer-produced cheques on the basis of a standing authority, the emphasis should be on accounting controls
Q. 732. rather than individual transactions. He summed up the Treasury attitude to the question of legislative amendments by stating that effective A.D.P. systems can be introduced within the framework of the existing system and that the further advantages to be gained from legislative amendments are of a more marginal nature and can be considered with a little more leisure.

(iii) Administrative Arrangements with the Bureau of Census and Statistics

Exhibit 86/12. 63. The Department of the Treasury advised us that its Budget and Accounting Branch is currently developing and/or implementing ten separate A.D.P. applications and, to 30 May 1966, this work had involved the use of the Bureau's computer facilities for a total of 2,278 hours. It seemed appropriate therefore to examine the joint use arrangements from the point of view of one of the major client departments. We have already referred to the organisational and traditional relationship between the Bureau of Census and Statistics and the Budget and Accounting Branch of the Department. The information sought from Mr Hill in the present context was in connection with specific facets of this relationship.

Q. 1310. 64. In response to a question concerning implementation of the remaining 87 per cent of specific Treasury A.D.P. applications over the next two years, Mr Hill informed us that it is the Treasury's intention to utilise the Bureau's network for these projects provided, of
Q. 1320. course, there is sufficient capacity available. He agreed that the Sub-Treasury organisation in Australia is almost parallel to the State dispersal of the Bureau's installations and that, in this respect, the use of this equipment is an ideal arrangement from the Treasury point of view.

Q.'s 1326 and 1338. 65. Questioned as to the necessity or otherwise for a system of priorities as between the Bureau and its client departments, Mr Hill informed us that the allocation of computer time
Q. 1334. is determined by the Bureau. He explained that his Branch makes application for computer time as and when it is required, together with an indication of the nature of the processing
Q. 1326. to be undertaken. In making the requirements known, however, the Budget and Accounting Branch presses for absolute priority in respect of 'time critical' accounting systems, for example systems that must necessarily operate within inflexible time schedules.

66. He indicated that the future requirements of the Budget and Accounting Branch in terms of computer time would be fairly extensive, particularly in Sydney and Melbourne where the centralised reconciliation of drawing accounts will be effected. In this connection, he stressed that although at present client departments negotiate the allocation of computer time with the Bureau, this should not imply that the Budget and Accounting Branch is prepared to leave future planning entirely to the Bureau. He explained that a detailed statement of requirements of the Budget and Accounting Branch for the ensuing 18 months was submitted to the Bureau on 8 August 1966 and that intensive discussions on the implications of this comprehensive document were imminent. Q. 1340. Q. 1341. Q. 1349.

(iv) Future Development of A.D.P. Systems

With regard to the long-term assessment of A.D.P. requirements of the Branch, Mr Hill declined to forecast what the requirements may be in the next decade, and suggested that in that period of time new developments and techniques in A.D.P. could emerge which could change the situation substantially. Q. 1347.

68. As to whether or not the Budget and Accounting Branch had formulated any plans to acquire A.D.P. equipment for its sole use, Mr Hill stated that the relationship between the two branches of the Treasury, i.e., the Budget and Accounting Branch and the Bureau of Census and Statistics, was such that no termination of this arrangement was likely unless such a course was mutually agreed upon. He reiterated that forward planning was, at this stage, limited to conversion of the specific systems in the current programme in accordance with the schedule of target dates set for each project. A comprehensive analysis of short term computer requirements to implement this programme had been communicated to the Bureau and this document, in fact, constituted the extent of forward planning that had been initiated by the Budget and Accounting Branch. Q. 1318. Q. 1319. Q. 1318.

(v) Management Structure

69. In Chapter 4 of our Eighty-fifth Re
levels in various A.D.P. environments. In this port we referred to comparative management highest level officer in the Department of Treacontext we were informed by Mr Hill that the with computer systems is the Director (A.D.P.sury whose responsibilities are wholly involved equivalent to that of a Chief Finance Officer.). His status in the departmental organisation is

(v) Staff Recruitment and Training

70. Mr Hill informed us that the Budget and Accounting Branch had recruited fifteen A.D.P. staff in the United Kingdom at a cost of $31,800. This represented approximately one-third of the Branch's A.D.P. section. Two of the officers recruited overseas had resigned from the Branch at 30 June 1966 and although Mr Hill was unable to give us precise reasons for these resignations, he understood that they had arisen from offers of more attractive employment elsewhere. Q. 1301 and Exhibit 86/12. Exhibit 86/12. Q. 1305.

71. According to departmental submissions, the initial approach to staff training was to arrange for new appointees to the Treasury A.D.P. section to attend one of the basic Fortran courses held periodically by the Bureau of Census and Statistics and C.S.I.R.O. Subsequently, all staff joining the Section with previous experience and training in A.D.P. were required to undergo a six-months familiarisation and training course in: Exhibit 86/12.

Basic Fortran programming;
Treasury Standards and Systems Analysis and A.D.P. performance;
Treasury structure, organisation and procedures; and
Subject matter knowledge of operational systems under development.

72. In addition to training A.D.P. staff, the Section also undertakes the training of Sub-Treasury staff required to operate production systems. This training usually takes two to three months, the first month being spent on explanation and familiarisation of the procedural and operating instructions and the final two months in operating the system under the supervision of the A.D.P. project team concerned.

73. In 1964 four trainees were enrolled on a Programmer-in-training course conducted by the Bureau of Census and Statistics on behalf of the Public Service Board. In 1965, eleven trainees were enrolled on a similar course, and nine officers are undertaking this course in 1966.

74. Use has been made of the technical manuals supplied by the manufacturers and the Bureau and in addition, officers from the Section attended lectures given by the manufacturers and the Bureau of Census and Statistics.

(vii) Capital and Operating Costs

Exhibit 86/12. 75. As a result of the joint use arrangements with the Bureau the only additional capital expenditure incurred by the Budget and Accounting Branch of the Treasury to 30 June 1966 was $65,400 in respect of data preparation and transmission equipment.

76. The total operating costs to 30 June 1966 are summarised in the following table:

TABLE No. 6

Department of the Treasury

(Budget and Accounting Branch)

A.D.P. Operating Costs to 30 June 1966

—	$
Hire/Rental—Data preparation and data transmission equipment (including maintenance) ..	4,600
Salaries and Wages	327,000
Incidentals (e.g. magnetic tape, paper tape, punched cards stationery)	500
Total	332,100

CHAPTER 4—THE TAXATION BRANCH

(i) Historical Background

Exhibit 86/10. 77. In its submission the Branch informed us that it was agreed in principle in April 1963, following discussions with the Public Service Board, Department of the Treasury and the Bureau of Census and Statistics that the possibility of processing Taxation Branch work on the Bureau's network would be examined. At that stage, the Branch had completed its exploratory study and had reached the final stages of its feasibility study. We sought Mr Grant's view therefore as to whether or not the value of the preliminary studies had been diminished by the decision to use the Bureau's equipment for the initial stages of implementation. He informed us that some of the cost of the feasibility study was attributable to the necessity to include work in that study that would not otherwise have been undertaken. At our request he subsequently advised that, in making any retrospective assessment of the effect of the decision to use the computer equipment of the Bureau it is necessary to traverse broadly the history of the introduction of A.D.P. into the Taxation Branch. He stated that in accordance with the generally accepted A.D.P. practice, the feasibility study was undertaken on a 'fully integrated' basis of investigating all facets of the system in the Taxation Branch to determine those areas where the application of A.D.P. was feasible. It was recognised from the outset, however, that, of necessity, there was a need to ensure that the collection of revenue was in no way jeopardised by the transition to automatic data processing. Accordingly, implementation was planned by way of detailed testing, pilot schemes and a gradual changeover of selected areas of work leading up to a fully integrated A.D.P. system.

Q. 1173.

Q. 1174 and Committee File 1965/3.

Committee File 1965/3.

78. With those principles in mind, the feasibility study progressed towards specifying the areas of practical application of A.D.P. and defining broadly a fully integrated system. This work was continuing in April 1963 when the decision was taken to investigate the possibility of the Taxation Branch using the Bureau's computer equipment. At that stage no specific work had been done on the specification of equipment for the Taxation Branch although it was recognised that, at the conclusion of the feasibility study, equipment would have to be acquired if A.D.P. were to be introduced. Accordingly, the effect on the feasibility study of the offer of use of the Bureau's equipment was to defer the costly specification and purchase of equipment and to require comparatively simple consideration to be given to the suitability of the equipment offered.

Committee File 1965/3.

79. The feasibility study proper was, as a result, curtailed and merged into the design and implementation of a system which would not only meet the previously mentioned need for caution but would enable the Taxation Branch to use the Bureau's equipment. As a direct result, it was possible also to avoid the purchase of decimal currency accounting machines needed to replace obsolete machines and to introduce A.D.P. earlier than would otherwise have been possible.

Committee File 1965/3.

80. Mr Grant stated that, irrespective of the decision to use the Bureau equipment, the initial A.D.P. applications leading to the eventual implementation of a 'fully integrated' system would probably have been the Instalment and Issue Applications. Further, it is unlikely that these applications would have been operational but for the decision to utilise that equipment.

81. He claimed that, generally, it could not be asserted that the decision to use the Bureau's equipment resulted in any major additional expenditure by the Taxation Branch which would not have been eventually incurred. Indeed, it may well be contended that, far from costing money, the decision ensured an earlier entry into automatic data processing. Additionally, it should ensure a much speedier and less costly specification of suitable equipment for the needs of the Taxation Branch if and when such a course is undertaken.

82. Finally, invaluable experience was said to have been gained by both A.D.P. and management staff of the Taxation Branch generally in the practical introduction of A.D.P. which should facilitate the implementation of further applications within the Taxation Branch.

(ii) Development and Implementation

83. An exploratory study to establish whether or not A.D.P. could be advantageously and economically applied to the work of the Taxation Branch was commenced in November 1960 by a group of four officers. The report of this study, which demonstrated that a further and more detailed analysis should be undertaken was submitted in September 1961. The Public Service Board subsequently approved the establishment of an A.D.P. organisation to undertake the feasibility study. A report in which this study group recommended the introduction of A.D.P. into the Taxation Branch using the Bureau network was considered at a conference of the Commissioner of Taxation and Deputy Commissioners in November 1964. Exhibit 86/10.

84. Mr Grant informed us that eleven officers were engaged in the feasibility study for a period of ten months and this work force was increased to sixteen, including four Programmers-in-training, for a period of 18 months. During the last 8 months of the study the group was expanded to thirty-four officers, including eight Programmers-in-training. Q. 1101.

85. The total cost of the exploratory and feasibility studies which covered a period of almost four years was $300,386. We were informed that these studies were conducted in consultation and co-operation with the Public Service Board, the Inter-departmental Committee on A.D.P. and the Auditor-General's Office. Exhibit 86/10 and Q. 1101.

86. In its submission the Branch emphasised that the feasibility study was undertaken on a 'fully integrated' approach and that this was in accordance with the views of both the Public Service Board and the Inter-departmental Committee on A.D.P. Exhibit 86/10.

87. Questioned as to whether or not the actual implementation programme to date was inconsistent with the original concept, Mr Grant denied that the Branch had abandoned the integrated system. He pointed out that various practical considerations had necessitated an acceleration of some phases of the implementation programme but the ultimate aim is an integrated system. Mr Grant expressed the view that it may take from eight to ten years to achieve this objective. Q.'s 1107 and 1109. Q. 1105.

88. We were informed that, following the decision taken at the Deputy Commissioner's Conference in November 1964 to proceed with the introduction of A.D.P., the following implementation schedule was drafted: Exhibit 86/10.

Target Date	State Office	Application
1 July 1965 ..	South Australia ..	Instalment—processing connected with the collection of tax by instalments by employers from employees
1 July 1966 ..	New South Wales ..	Instalment processing
	New South Wales, Victoria and South Australia	Issue—preparation of Notices of Assessment and refund cheques

89. Mr Grant informed us that the projects listed in the initial implementation schedule covered two large scale areas in terms of volume and these had reached operational status as scheduled.

Q. 1107.

(iii) Benefits and Advantages Attributable to the Use of A.D.P.

90. We were informed that the introduction of A.D.P. into the areas specified in the feasibility study report should result in annual savings of $2,348,600. Questioned as to whether or not the savings arising from partial implementation tended to confirm the original estimate, Mr Grant stated that the estimate of savings in the feasibility study report was based on a fully integrated system being introduced. He pointed out that the Branch had, as yet, only reached the initial stage of implementing the system and suggested that at this stage costs generally outweigh any savings that might ultimately be anticipated. He added that some procedures had resulted in savings but in other areas it had been found that the expenditure incurred exceeded the level it would have reached without the introduction of A.D.P. He stressed, however, that progressive implementation would enable a greater volume of work to be performed more efficiently with less staff.

Q.'s 1103 and 1104.

Q. 1106.

Exhibit 86/10.

91. Reference was made in the submission to estimated savings of $300,000. It was contended that the accelerated introduction of A.D.P. had obviated the necessity to expend this amount on the purchase of decimal currency accounting machines. In response to a question as to why the Branch's existing machines could not have been converted to decimal currency, Mr Grant stated that it would have cost $300,000 to replace obsolete machines and added that if conventional machines had to be used it would have been preferable to purchase replacement machines rather than to convert the older existing machines to decimal currency.

Q. 1110.

Q. 1144.
Q. 1183.
Q. 1184.

92. In regard to the assessment of tangible benefits of A.D.P. generally, Mr Grant agreed that there should be an early approach to the measurement of savings. He added that his Branch had, in fact, already made some calculations of comparative operating costs in respect of the procedures that have been converted to A.D.P. We were later advised that these cost calculations were based on the assessment of major items such as salaries and wages, rent of office accommodation, rent value of conventional machines and data preparation equipment under both conventional and A.D.P. systems. The results were then compared. In assessing the cost of the A.D.P. systems no charge was included for the computer time used under those systems as no charges are raised by the Bureau. The estimated savings in the instalment application operating in the Taxation Offices in New South Wales, Victoria and South Australia were calculated to be $76,263 annually. That saving was said to be attributed broadly to eliminating the need to sort manually each year, over 4,500,000 original group certificates and to compare those original group certificates with their duplicates. It was stated that it is necessary to make that comparison to ensure that the credit allowed to employees in their income tax assessments agrees with the remittances made by employers of the tax instalments deducted from employees. This comparison is now being achieved by computer process. We were further advised that the savings in the Taxation Offices in New South Wales, Victoria and South Australia arising from the proposal of the Department of the Treasury to reconcile drawing accounts for those Offices by computer has been estimated at $83,650 annually. The saving in this area stems from avoiding the annual task of manually sorting, inter-sorting and marking off over 3,000,000 paid cheques and effecting a reconciliation of the drawing accounts.

Committee File 1965/3.

Ibid.

Q. 1142.

93. Mr Grant stated that he was unable to give an accurate estimate as to when the costs associated with the introduction of A.D.P. in the Taxation Branch might be recovered. He pointed out that one application is already operating at a lower cost than under the manual system, whilst others are at present costing relatively more to operate. He indicated that the ratio of staff to applications will not increase commensurately with the conversion of additional systems but the significance of this factor was difficult to assess at this stage.

(iv) Administrative Arrangements with the Bureau of Census and Statistics

Q. 1114.

94. Mr Grant informed us that the joint use of A.D.P. equipment had not presented any real administrative problems to the Taxation Branch. He added that the Bureau had been very co-operative not only in the provision of computer time but in providing whatever assistance was necessary by way of advice, staff training and use of the computer. He expressed the view that the implementation problems that had been encountered were not attributable to joint use of the equipment.

95. With regard to the allocation of computer time, Mr Grant explained that estimates of time required by the Taxation Branch are indicated to the Bureau and mutual agreement as to allocation is reached after close negotiation and discussion between the two organisations. Q. 1116.

96. Total utilisation of the Bureau's network by the Taxation Branch to 30 June 1966 was 2,538 hours. At the 28 July 1966 the daily usage was twenty-eight hours made up as follows: Exhibit 86/10. Q. 1115.

Sydney Installation ..	12.00
Melbourne Installation ..	10.15
Adelaide Installation ..	5.45
Total	28.00 hours

(v) Management Structure

97. We were informed that the Director A.D.P. is the highest level officer in the Taxation Branch whose responsibilities are solely involved with A.D.P. systems. Other officers senior to the Director A.D.P. devote part of their time to this work. Q. 1154.

(vi) Management Training

98. Although Mr Grant was unable to state accurately the extent to which top management in the Taxation Branch had undertaken courses in A.D.P., we were subsequently furnished with a written statement which included the following details: Committee File 1965/3.

TABLE No. 7

Taxation Branch

Extent of Executive Training in A.D.P.

Type of Course	Duration	Executives who attended
1. Conference on present stage of development and future of A.D.P. conducted by the Public Service Board	1 day ..	First Division The Commissioner The former Commissioner Second Division— The Deputy Commissioner, Victoria The former Deputy Commissioner, Central Office The Assistant Commissioner, Management Services Division Third Division— Assistant Deputy Commissioner, Victoria The former Director, Revenue and Research Branch
2. Executive Appreciation Courses conducted by IBM	2–3 days ..	First Division— Second Commissioner Second Division First Assistant Commissioner, Management Services Division Former First Assistant Commissioner, Interpretation Division Former Assistant Commissioner, Management Services Division
3. Executive Appreciation Course conducted by IBM	5½ days ..	Second Division— Former Assistant Commissioner, Management Services Division Third Division— Director, A.D.P. Branch
4. A.D.P. Appropriation Courses for Executive conducted by the Public Service Board	3 days ..	Second Division— First Assistant Commissioner, Management Services Division The Deputy Commissioner, Central Office Two Assistant Deputy Commissioners, New South Wales Assistant Deputy Commissioner, Victoria Third Division— Director, General Management Branch Assistant Deputy Commissioner, Queensland Assistant Deputy Commissioner, Western Australia Assistant Deputy Commissioner, South Australia Assistant Deputy Commissioner, Tasmania

TABLE No 7—*continued*

TAXATION BRANCH—*continued*

Extent of Executive Training in A.D.P.—*continued*

Type of Course	Duration	Executives who attended
5. Royal Melbourne Institute of Technology A.D.P. Course	2 nights per week for 6 months	Second Division— The Assistant Commissioner, Management Services Division Third Division— Assistant Deputy Commissioner, Victoria
6. A.D.P. Systems Analysis Course conducted by the Public Service Board	14 weeks ..	Third Division— Director, A.D.P. Branch

(vii) STAFF RECRUITMENT AND TRAINING

99. Details of the various training courses undertaken by officers of the Taxation Branch are summarised in the following table:

Exhibit 86/10.

TABLE No. 8

EXTENT OF TRAINING IN A.D.P.

Type of Course or Training	Duration	Attendance
1. Internal Training—		
(*a*) data preparation courses	2 to 10 weeks	481
(*b*) procedural instruction courses	2 to 6 hours	1,084
(*c*) instructional courses for Supervisors	2 to 5 days	81
(*d*) induction courses for programmers-in-training	1 week	17
(*e*) on-the-job training for programmers-in-training	6 months	24
(*f*) full scale test of Issue Application	2 weeks	240
(*g*) testing of Issue and Instalment Applications	1 to 12 days	230
2. Public Service Board—		
(*a*) A.D.P. Systems Analysis Courses	10 to 14 weeks	29
(*b*) Conference on A.D.P. Development and Future	1 day	7
(*c*) A.D.P. Appreciation Courses for Executives	3 days	19
(*d*) Middle Management A.D.P. Appreciation Courses	3 days	12
(*e*) COBOL Training Courses	3 to 5 days	9
3. Bureau of Census and Statistics—		
(*a*) C.D.C. 3600 course	3 weeks	5
(*b*) SCOPE course	1 week	3
(*c*) Training in FORTRAN	6 to 10 days	7
(*d*) Programmer-in-training courses	6 months	24
(*e*) Schedulers course	8 days	11
4. Department of Defence—		
Training in programming	6 months	3
5. Machine Companies—		
(*a*) IBM Executive Appreciation Course	5½ days	2
(*b*) Honeywell 400 Program Course	5 days	2
(*c*) Honeywell 400 Seminar	2 days	4
(*d*) IBM—COBOL	5 days	3
(*e*) General Electric—GECOM	5 days	1
(*f*) Ferranti	2 days	2
(*g*) Silliac, University of Sydney	5 days	2

Q. 1130.

100. In view of the apparently comprehensive range of training courses referred to in Table No. 8 we suggested to Mr Grant that these facilities should eliminate the need to recruit trained personnel overseas. He prefaced his reply by stating that initially, the Branch had advertised extensively in Australia for trained programmers without success. Consequently recruits were sought overseas and in his view the A.D.P. Section could not otherwise have been staffed. As to whether or not local training facilities have eliminated the need to recruit overseas, Mr Grant expressed the opinion that whilst self-sufficiency is the

objective of the training programme, this point has not yet been reached. He later qualified this proposition, however, by pointing out that the Branch had not sought any overseas recruits in the current year and it was hoped that the Programmer-in-training course would meet future requirements. Q. 1140.

101. We were informed that the Branch recruited twelve trained officers in the United Kingdom at a cost of $21,040 and as at the 30 June 1966, four of these had resigned to accept employment elsewhere. Exhibit 86/10.

102. Although none of the overseas recruits were engaged in the use of A.D.P. equipment in the taxation field prior to their appointment to the Branch, Mr Grant explained that they were skilled in the use of computers for the systems being developed. We sought his views as to whether or not it may be advantageous to continue the cross fertilisation of ideas on computer usage by occasional overseas recruitment and by sending locally trained officers overseas for further experience. He said that he saw advantages in recruitment from overseas and added that he doubted if the present level of development in the Taxation A.D.P. applications could have been achieved without the skill and experience of the overseas recruits. He also agreed that it would be advantageous to send locally trained officers overseas with the object of advancing their knowledge of A.D.P. techniques but added that the demand on staff resources virtually precluded any such arrangement at this stage. Q.'s 1131 to 1133. Q. 1167

(viii) Capital and Operating Costs

103. In common with other client departments of the Bureau of Census and Statistics the Taxation Branch did not incur any capital expenditure on a central processing unit and its peripheral equipment. Their capital expenditure and operating costs associated with the introduction of A.D.P. are summarised in the following tables: Exhibit 86/10.

TABLE No. 9

Taxation Branch

Capital Expenditure to 30 June 1966

Item	$
Data Preparation Equipment	23,132
Alterations to Buildings	34,093
Forms handling equipment	14,103
Furniture and fittings	33,556
Total	104,884

Exhibit 86/10.

TABLE No. 10

Taxation Branch

A.D.P. Operating Costs to 30 June 1966

Item	$
Maintenance—Data Preparation Equipment	290
Maintenance—Buildings	7,967
Hire/rental—Data Preparation Equipment	90,466
Hire/rental—Buildings	91,840
Salaries and Wages	725,559
Power	3,942
Paper tape	14,240
Stationery	60,490
Emergency Standby Facilities	10,840
Travelling Expenses	72,141
Other	23,044
Total	1,100,819

Exhibit 86/10.

104. In connection with the amount of $90,466 paid for the hire of data preparation equipment, Mr Grant informed us that the decision of the Branch to hire rather than purchase this equipment was in conformity with the approach that had already been adopted Q. 1121.

by the Bureau of Census and Statistics. He added that at present the hiring system (which includes maintenance) was satisfactory for the Branch's purposes. As to the length of time
Q. 1125. this arrangement is likely to continue he indicated that the possibility of replacing the existing data preparation equipment with machines of a different type was currently being con-
Q. 1127. sidered. He expected, however, that much of the present equipment will be used for a
Q. 1129. number of years unless technical developments render it obsolete. He stated that the question of rental as opposed to purchase of data preparation equipment was not at present under review but that this matter will not be overlooked particularly if the stage is reached where replacement of present data preparation equipment with machines of a different type is to be considered.

(ix) Future Development of A.D.P. Systems

Q. 1117. 105. Mr Grant indicated that whether or not the Taxation Branch should continue to use the Bureau of Census and Statistics network indefinitely is a question of network capacity. He added that whilst the existing arrangements are working very satisfactorily, the present level of processing by his organisation is only a fraction of the total system. He knew of no plans for expansion of the Bureau of Census and Statistics system and was not in a position to assess whether or not the present network had sufficient capacity to accommodate the
Q. 1120. progressive development of Taxation Branch applications. In this connection he informed us that no additional applications are envisaged in the ensuing twelve months and that this time would be spent on the modification and refinement of present programmes. He expected that these programme amendments will reduce computer running time and thus make time available for additional applications but at this stage there is no firm implementation schedule.

Q. 1152. 106. In response to a question as to the type of functions that he envisaged will be converted to A.D.P. in future planning, Mr Grant expressed the view that the fully integrated system will include recording and indexing systems, a complete accounting system and the elimination of large areas of manual checking. He also expected that preparation of taxation assessment notices which at present is limited to 'current year' individual taxpayers, will be extended to 'prior years' assessments, amendments and company assessments. He indicated that extension of automatic processing to all taxes, e.g. sales tax, payroll tax, estate and gift duty, is envisaged. At present only income tax payable by individuals is processed by computers. He pointed out, however, that some sections of the Branch's activities cannot be converted readily to A.D.P. In this category he included investigation work, assessing, and procedures relating to appeals.

Q. 1105. 107. In earlier evidence Mr Grant had informed us that implementation of the fully integrated system may involve eight to ten years. In view of the apparent effectiveness of
Q. 1177. the first stage of the Branch's A.D.P. system, we sought his views as to the practicability of accelerating the implementation programme and in particular whether or not earlier implementation might justify the acquisition of a computer solely for taxation purposes. He indicated that the possibility of the Branch establishing its own computer installation is being examined and that the critical factor is whether or not the Bureau of Census and Statistics could continue to provide sufficient computer time to enable the Branch to extend its A.D.P. systems.

CHAPTER 5—THE SUPERANNUATION BOARD AND THE DEFENCE FORCES RETIREMENT BENEFITS BOARD

(i) Historical Background

Q.'s 1350 and 1351. 108. Before taking evidence in connection with specific features of A.D.P. systems we requested Mr Burgess to clarify his relationship as President and Chairman respectively of the two statutory Boards referred to above and the Department of the Treasury. He explained that basically the relationship stems from the fact that under the Administrative Arrangements Order, the Treasurer is responsible for the administration of the Superannuation and Defence Forces Retirement Benefits Acts. For this purpose the Superannuation Branch was established (within the Budget and Accounting Branch) to advise the Treasurer on major policy issues affecting legislation. To this extent the Superannuation Branch is in effect a combination of the offices of the Superannuation Board and the Defence Forces Retirement Benefits Board. Mr Burgess emphasised, however, that both Boards are separate entities and as President and Chairman respectively he is personally responsible for their administration in accordance with the terms of his statutory offices. He added that, in practice, there is close collaboration between the Boards and the Superannuation Branch and that the relationship as a whole is a material factor in the development of A.D.P. systems.

109. Mr Burgess informed us that use of the Bureau of Census and Statistics network by the Boards was not attributable to a single specific decision. He pointed out that the Bureau has undertaken work on behalf of the Superannuation Board since 1923 and this arrangement had developed progressively as work loads of the Boards increased and equipment facilities of the Bureau were expanded. It was therefore taken for granted that the Boards should work in conjunction with the Bureau of Census and Statistics in the development of automatic data processing. In this connection we were informed that the processing requirements of the Boards were taken into consideration by the Bureau of Census and Statistics in its preliminary systems analyses. He pointed out, however, that the Boards were not directly involved in decisions connected with the type or configurations of computer equipment and software support acquired by the Bureau. He indicated that the present joint use arrangement represented a logical extension of established practice and that, although the actual decisions concerning the selection of hardware and software were taken by the Bureau, there were prior extensive formal and informal negotiations between the Boards, the Department of the Treasury and the Bureau. He added that in regard to timing of the proposed introduction of systems, the availability of the Bureau's computers coincided with the Board's requirements. Q. 1358. Exhibit 86/13. Q.'s 1365 to 1367. Q. 1380.

(ii) Development and Implementation

110. We were informed that exploratory and feasibility studies in the sense of formal investigations were not made mainly because the accounting systems of both Boards had, over a long period, been designed to permit advanced mechanisation. Consequently, basic computer projects were readily identifiable without comprehensive research. Reference was also made to a long history of the use of punched card equipment for statistical and valuation information processes. Mr Burgess mentioned that in 1958 the Superannuation Board had formed a small committee to examine the future of A.D.P. in relation to the Board's activities but the work of this committee did not constitute a feasibility study in the formal sense. In this context he indicated that, whilst he recognised the value of exploratory and feasibility studies as a general proposition, the Boards' experience in mechanised accounting coupled with the fact that they were not required to draft a hardware specification eliminated the necessity for such studies. Exhibit 86/13. Q. 1381. Q. 1357.

111. In our Seventieth Report we expressed the view that the implementation of A.D.P. proposals would provide considerable relief for the Boards in regard to the effect on work fluctuations. It seems apparent, however, that peak loads continued to present acute problems in the data preparation area. In this connection Mr Burgess informed us that data preparation workloads in connection with the distribution of the quinquennial surplus at 30 June 1962 were such that the Superannuation Board was obliged to let a contract to a private firm for preparation of 225,000 Superannuation contributors' variations. He indicated that the Boards could not maintain sufficient staff to handle peakloads of work caused by changes in legislation and arbitration determinations and the necessity to 'contract out' may therefore recur. P.P. No. 160 of 1964–65. Q. 1369. Q. 1370.

112. Total utilisation of the Bureau of Census and Statistics network by the two Boards to 31 May 1966 was 856 hours made up as follows:

	Hours
Canberra Installation	797.41
Sydney Installation	7.31
Melbourne Installation	27.14
Adelaide Installation	23.39
	856.05

Exhibit 86/13.

Mr Burgess also informed us that he had utilised the C.S.I.R.O. computers for approximately 25 hours for programme development and production processing. Q. 1361.

113. In his submission Mr Burgess informed us that computer applications for the Superannuation and Defence Forces Retirement Benefits Boards may be identified as elements of a total system. However, because special tasks have become matters of administrative emergency, since the computer time became available at the Bureau of Census and Statistics it has become necessary to concentrate on short-term needs. As far as possible characteristics of the permanent system have also been incorporated. Questioned as to the nature of the emergency referred to in his submission, Mr Burgess instanced a comprehensive change in the payment of pensions in 1959 and adjustment of the quinquennial surplus as at 1962 as typical examples of critical situations that demanded short-term implementation. Exhibit 86/13. Q.'s 1377 and 1378.

114. The status of the Boards' A.D.P. applications which have been developed or were in course of development at 30 June 1966 are summarised in the following tables.

Exhibit 86/13.

TABLE No. 11

SUPERANNUATION BOARD.

Status of A.D.P. Applications at 30 June 1966

Project	Operational Date
Quinquennial Surplus at 30.6.62 (Superannuation contributions) ..	March 1966 (Partially implemented)
Superannuation Contributors' History and Deduction Records ..	June 1965 (Partially implemented)
Quinquennial Surplus Adjustments (Provident Account).. ..	March 1966
Provident Account Contributors' History and Deduction Records..	Under development
Quinquennial Surplus Payments to Pensioners (Superannuation Benefits)	December 1965 (Partially implemented)
Pensioners' History and Payments Due Records (Superannuation Benefits)	Under development
Other Superannuation Benefits—	
1. Calculation of Provident Account payments on termination ..	July 1966
2. Calculation of refunds of Superannuation Fund contributors on termination	July 1966
3. Calculation of refunds of reserve units plus interest.. ..	July 1966
Superannuation Statistics and Information Retrieval	Under development

Exhibit 86/13.

TABLE No. 12

DEFENCE FORCES RETIREMENT BENEFITS BOARD

Status of A.D.P. Applications at 30 June 1966

Project	Operational Date
Actuarial Valuation Statistics for 1959–64 investigations.. ..	December 1965 (Partially implemented)
Contributors' History and Deduction Records	Under development
Actuarial Valuation Statistics for 1959–64 valuation	October 1964 ('one time' application)
Pensioners' History and Payments Due records	Under development
Other D.F.R.B Benefits—	
1. Calculation of refunds of D.F.R.B. contributions	Under development
2. Calculation of costs of deferred contributions	Under development
Statistics and Information Retrieval	Under development
Combined Investments and Financial Records	Under development

Q. 731. 115. We sought Mr Burgess's comments on the view expressed by Mr Harris that it may be necessary to contemplate amendments to the Public Service Act, the Audit Act and the Superannuation Act in order to co-ordinate certain information and thus make optimum use of automatic processing. He informed us that there had been some minor amendments to the Superannuation Act which were sufficient for the Boards' purposes at present. He then referred to the legal implications of computer generated records and in particular the value of magnetic tape records as evidence. He added, however, that the Boards have adopted a policy of maintaining records that may be tendered as primary evidence and he considered that a very efficient system can be built up within this concept. He mentioned that he had only raised the question of admissibility of computer generated records as primary evidence in legal proceedings as one of the issues to be considered in the design of A.D.P. systems. He added that in the Boards' applications, all computer output is capable of positive verification. In response to our inquiries as to whether or not the Boards' A.D.P. systems involve documentation that serves no other purpose than the anticipated requirements of the Courts, Mr Burgess assured us that the existing records are necessary for the normal conduct of the Boards' business. He pointed out that when every contributor leaves the Service, manual records of his contributions are verified by reference to source documents and at this stage the Boards' A.D.P. systems are not oriented towards possible forensic requirements.

Q.'s 1354 and 1394.

Q. 1399.

Q. 1400.

Q. 1401.

(iii) MANAGEMENT STRUCTURE

Q. 1386. 116. Mr Burgess informed us that the senior programmer is the highest level officer in the Boards' organisation whose duties are wholly involved with A.D.P. He added that at the present time both he and his secretary also devote a considerable proportion of their time to the development of A.D.P. systems.

(iv) Staff Recruitment and Training

117. We were informed in the Boards' submission that two of their officers completed a programming course of six weeks' duration conducted by the Bureau of Census and Statistics. Two other officers qualified as programmers from the 1965 Programmer-in-training course which is also conducted by the Bureau on behalf of the Public Service Board. Additionally, two temporary Assistant Programmers who had some prior knowledge of programming have been given in-service training. In connection with the outline of staff training which he had furnished we asked Mr Burgess if it were correct for us to assume that six weeks formal training was all that was necessary to raise an officer to the level of programming efficiency required by the Boards. He informed us that the basic training course of six weeks was supplemented by in-service supervision and further assistance by the Programmer-in-charge. He considered that in view of the highly satisfactory results that have been achieved the type and duration of training had been adequate. Exhibit 86/13. Q. 1376.

118. Questioned as to whether or not the Boards had experienced similar problems to other branches and departments in the recruitment of A.D.P. personnel, Mr Burgess expressed the view that this problem is common to all organisations engaged in the development of A.D.P. in the Commonwealth sphere. He pointed out that in 1965 the Boards required four to five trainee programmers but succeeded in recruiting only one. He added that he had advised the Public Service Board of his requirements and was hopeful of an allocation of trainee programmers. In this connection Mr Shaw informed us that the Public Service Board conducts recruiting campaigns for trainee programmers on the basis of requirements assessed by departments and branches for the ensuing year. Mr Burgess indicated that some members of the Boards' staffs had demonstrated the necessary aptitude for programming but they were in key positions and could not be released to undertake the Programmer-in-training course. Q. 1371. Q.'s 1372 to 1374. Q. 1372.

119. In regard to the adequacy of training facilities provided by the Bureau of Census and Statistics, Mr Burgess informed us that the present courses had met the Boards' requirements. However, he reiterated that the formal training received by new appointees to the Commonwealth Service who undertake the Programmer-in-training course must necessarily be supplemented by in-service training by the Boards' senior officers. We were informed that only one member of the two Boards' staffs was recruited overseas and this officer was still in the Boards' employ at 30 June 1966. According to the submission the cost to the two Boards of recruiting this officer was $300. Q. 1375. Exhibit 86/13.

(v) Capital and Operating Costs

120. Implementation of A.D.P. systems to 30 June 1966 did not involve the Boards in any capital expenditure. Exhibit 86/13.

121. Total operating costs (including data preparation contracts outside the Commonwealth Service) to 30 June 1966 are summarised in the following table:

TABLE No. 13

Superannuation and Defence Forces Retirement Benefits Boards

A.D.P. Operating costs to 30 June 1966

Item	$
Hire/rental—Data Preparation and transmission equipment	16,485
Salaries and wages	398,250
Incidentals (e.g., magnetic tape, paper tape, punched cards, stationery)	22,000
Total	436,735

(vi) Benefits and Advantages Attributable to the Use of A.D.P.

122. Referring to intangible benefits Mr Burgess claimed that, at this stage, the development of A.D.P. techniques has provided basic records which will enable the Boards to move quickly towards the compilation of full historical computer records which should reduce delays in the preparation of statistical and evaluation information for the Actuary as from Q. 1381.

June 1967 and also facilitate the preparation of the Boards' annual reports. He pointed out that computer programmes developed to adjust the recent quinquennial surplus had also materially assisted the compilation and validation of historical records. In respect of Provident Account records he explained that pensioners' history and payments records were completely reconstructed in connection with the quinquennial surplus and that an advanced integrated system in respect of Provident Account records should be operational within approximately six months, i.e. February 1967. He stressed that although the Public Service Board had
Q. 1379. approved an increase of eighty officers in the Boards' staff, this was only a small proportion of the number that would have been required if computers had not been available.

Q. 1381. 123. As to tangible benefits, Mr Burgess stated that the development of A.D.P. will enable the Boards to employ advanced systems in terms of superannuation contributors records within twelve to eighteen months. Additionally the Boards have been able to furnish the Actuary with much more comprehensive statistics than he would have otherwise received.
Q. 1393. In this regard he expressed the view that A.D.P. systems when fully developed should enable the Boards to control investment portfolio adjustments, predict income growth and thus
Q. 1382. minimise the legislation of aggregation of surpluses within the funds. He did not consider that the Boards could assess with any degree of accuracy the financial savings or costs attributable to the introduction of A.D.P. He suggested that such an analysis may be practicable in another twelve to eighteen months when the efficiency of the more advanced systems can be measured in terms of peak load absorption. He added that in some applications
Q.'s 1384 and 1385. minor savings were identifiable, but although he had examined this matter prior to the hearing he was unable to give any estimate of monetary savings at this stage.

(vii) Future Development of A.D.P. Systems

Q.'s 1358 and 1359. 124. We sought Mr Burgess' views as to whether or not the existing arrangements with the Bureau of Census and Statistics indicated that the Boards could leave their future requirements in the hands of the Bureau. He disagreed with this proposition and pointed out that the Bureau's equipment may not necessarily be suitable for the type of systems envisaged by the Boards, e.g. systems incorporating real time interrogation facilities. He stressed, however, that if the Boards eventually established their own A.D.P. installation it will need to be completely compatible with the Bureau's computers to enable the Boards to utilise the network for periodic large-scale projects. In this context he emphasised that a decision to
Q. 1352. acquire A.D.P. equipment would not be taken by the Boards without consultation with the Department of the Treasury and other organisations directly concerned.

Q. 1387. 125. On the question as to whether or not the Boards are likely to acquire their own computers within five years, Mr Burgess indicated that this depended on whether or not the Bureau of Census and Statistics network is expanded to include instantaneous inquiry facilities. He pointed out that the Boards would require a very large scale machine to handle peak loads and at this stage it was difficult to anticipate what form future developments will take.

CHAPTER 6—THE DEPARTMENT OF HEALTH

(i) Historical Background

Exhibit 86/11. 126. The initial introduction to the use A.D.P. in the Department of Health was its participation in a working party appointed in 1961 by the Inter-departmental Committee on A.D.P. to undertake an assessment survey covering all Commonwealth departments. The basic purpose of the survey was to establish the Commonwealth-wide potential for computing facilities.

127. In May 1962, the Department of Health requested that its processing be undertaken on equipment proposed for the Bureau of Census and Statistics. This arrangement was to be regarded as an interim measure which would not prejudice the right of the Department to seek its own computer facilities in the future. Arrangements were made for the Bureau to continue to provide assistance in exploratory work associated with the introduction of A.D.P. in the pharmaceutical benefits area until an A.D.P. study group within the Department of Health could be formed and qualified to continue with the feasibility study.

Exhibit 86/11. 128. Since the Department's proposals for the introduction of A.D.P. did not involve the acquisition of computer equipment no reference to the Inter-departmental Committee on A.D.P. in respect of these proposals was necessary. We were informed, however, that the A.D.P. system introduced into the pharmaceutical benefits area was approved by the Department of the Treasury in April 1965.

(ii) Development and Implementation

129. A Preliminary Systems Design Report covering the pharmaceutical benefits scheme was submitted to the management of the Department of Health for consideration in March 1963. Mr Searle informed us that two officers from the Department were engaged on the feasibility study from August 1962 until March 1963. We were later advised that the cost of this work to the Department amounted to $5,000. Q. 1198. Committee File 1965/3 and Q. 1199.

130. Although the basic exploratory study covered both the pharmaceutical benefits and the pensioner medical service procedures, the Department stated in its submission that in view of increasing volumes and rapidly rising costs it was decided to direct all available A.D.P. resources to an examination of the feasibility of converting pharmaceutical benefits systems to A.D.P. Consequently the analysis of the pensioner medical service system was not taken beyond the exploratory stage. Exhibit 86/11.

131. We sought information from Mr Searle as to the nature of the assistance given to the Department by the Bureau of Census and Statistics during the exploratory and feasibility study stages. Mr Searle understood that the Bureau's officer who was assigned to the Department of Health projects assumed three separate roles. First, on behalf of the working party that undertook the initial exploratory work covering all departments of the Commonwealth; secondly as part of the work associated with the general requirements for the configuration that was ultimately procured by the Bureau of Census and Statistics and, thirdly, he was requested by the Department of Health to continue to assist with the exploratory and feasibility studies until the departmental A.D.P. group which was being formed was competent to continue the work. Q. 1201.

132. The Department stated that the A.D.P. system for pharmaceutical benefits payments was introduced from 1 July 1965 when 76 chemists from selected areas in Queensland began submitting pharmaceutical benefits claims to the Department for automatic processing. In later months the scheme was extended throughout Queensland. All 800 chemists in that State were operating under the new system by 1 January 1966. A similar approach to implementation has been adopted in South Australia, New South Wales and Western Australia and as at 1 July 1966 approximately 2,000 chemists out of the Commonwealth total of 5,554 were preparing claims for automatic processing. The gradual approach to implementation was adopted because of the need to effect the changeover without disruption to the payments processing and to co-ordinate such factors as machine acquisition and acceptance testing, staff recruitment and training, retraining of staff and chemists, procurement of suitable accommodation and negotiations with the Federated Pharmaceutical Service Guild and the Australian Medical Association. Exhibit 86/11. Exhibit 86/11.

133. Mr Searle agreed that the factors that influenced the Department to adopt a gradual approach to implementation virtually precluded any other approach and added that the necessity to maintain continuity without disruption of the existing manual payments system was of particular importance to the Department. Q. 1207.

134. The Department also referred to the extent to which it had been necessary to gain and retain the confidence and co-operation of private organisations for the successful introduction of A.D.P. into the pharmaceutical benefits scheme. It pointed out that it was essential that both doctors and chemists should be aware of the new method of processing and of the formal procedures that had to be observed. Consequently the Department participated in extensive negotiations with the Australian Medical Association, the Federated Pharmaceutical Services Guild and the Friendly Society Dispensaries and held detailed discussions and consultations with individual members of these professional groups. In addition to the dissemination of information in the form of circulars and other publications, the Department has organised a planned programme of local meetings of chemists which are held immediately prior to the extension of A.D.P. to a particular area. These meetings are attended by senior departmental officers who explain the chemists' role in the operation of the system and discuss any problems that may arise. Commenting on the importance of the co-operation between all interested parties, Mr Searle expressed the view that the coding of prescriptions by chemists was an essential prerequisite to the introduction of A.D.P. into the pharmaceutical benefits scheme. He added that the technical resources necessary to convert prescriptions to a form in which they could be processed by a computer were not available to the Department and it was unable to procure them. He informed us that implementation of the A.D.P. system was also facilitated by the Australian Medical Exhibit 86/11. Q. 1213. Q 1214.

Association's agreement to the introduction of a standard type prescription form which provides space for chemists to record coded particulars and other data in a standard format on the face of the document.

Q. 1220. 135. In response to our questions concerning the extent of automatic processing in respect of pharmaceutical benefits payments, Mr Searle informed us that the A.D.P. system does not include the actual preparation of cheques forwarded to chemists. He added that this possibility had been examined in the initial planning stage but was rejected on the ground that the relatively low volume—approximately 66,000 cheques per annum—did not justify conversion of these procedures to A.D.P.

Exhibit 86/11. 136. The status of the Department's A.D.P. applications that were operational or in course of development by 30 June 1966 are summarised in the following table:

TABLE No. 14

DEPARTMENT OF HEALTH

Status of A.D.P. Applications at 30 June 1966

Applications	Operational Date
Pharmaceutical Benefits Payments and Management Control Information System ..	1 July 1965
Continuing survey into the effects on children's teeth of fluoride introduced into the Canberra water supply	January, 1967
Computer analysis of biological assays undertaken by the National Biological Standards Laboratory	March, 1965

Exhibit 86/11. 137. We were informed that since the inception of the Pharmaceutical Benefits Payments System in July 1965 work has been proceeding on the development and implementation of a comprehensive management control information system designed to support the payments system and provide the Department with a sound basis for cost control measures. Certain aspects of this system are already operating and it is expected that it will be fully operational before the end of 1966. Subject to any unforeseen circumstances the Department Exhibit 86/11. expects the pharmaceutical benefits A.D.P. system to be in full operation in all States by Q.'s 1208 and 1249 to 1251. Committee File 1965/3. July 1967. Mr Searle subsequently advised us that during the year 1965-66 pharmaceutical benefits prescriptions totalled 49,993,000 involving a Commonwealth expenditure on pharmaceutical benefits of $91,783,674.

Q. 1204. 138. Questioned as to whether or not the introduction of the pharmaceutical benefits A.D.P. system had necessitated any legislative amendments, Mr Searle stated that no amendments of the National Health Act had been necessary. He added, however, that minor Q. 1205. amendments had been made to regulations under the National Health Act in November 1965. These amendments related to administrative machinery and were intended to exempt medical practitioners from undertaking a procedure that had proved unnecessary with the introduction of A.D.P.

(iii) ADMINISTRATIVE ARRANGEMENTS WITH THE BUREAU OF CENSUS AND STATISTICS

Q. 1193. 134. Mr Searle informed us that the joint use of A.D.P. equipment arrangements between the Department of Health and the Bureau of Census and Statistics had proved particularly satisfactory to the Department and that the Bureau had done its utmost to ensure Q.'s 1248 and 1194 to 1196. that the Department's requirements are met. He added that all possible alternatives were examined and expressed the view that it would have been impossible for the Department to have commenced operational running of its A.D.P. systems in July 1965 if it had not entered into the joint use arrangement with the Bureau.

Exhibit 86/11. 140. The Department stated that between September 1964 and May 1966 it had operated on the Bureau of Census and Statistics network for a total of 2,180 hours made up as follows:

Canberra installation ..	1,825
Sydney installation ..	257
Adelaide installation ..	98
	2,180 hours

141. Of the total computer usage, 1,742 hours were spent on production running and the balance (438 hours) was required for programme testing and systems development.

142. Mr Searle informed us that the Bureau of Census and Statistics does not raise any charges against the Department in respect of computer usage and he was unaware of any proposals to do so. In response to a question concerning the original acquisition of computer equipment and software support by the Bureau of Census and Statistics he stated that the Department of Health A.D.P. Section was not in any way involved in the procurement decisions. He added, however, that in using the Bureau's equipment the Department is free to select any programming language or other software facility that is within the range of available software support for the Bureau equipment. Q. 1257.

(iv) Management Structure

143. Mr Searle, whose designation is Director, A.D.P. Section, Establishment and Finance Branch, stated that he is the highest level officer in the Department of Health whose responsibilities are solely involved with A.D.P. systems. Q. 1253.

(v) Management Training

144. Mr Holgate informed us that the Director-General, the First Assistant Director-General, a former First Assistant Director-General and other senior executive officers of the Department of Health have undertaken management training courses in A.D.P. Q. 1230. Q. 1254.

(vi) Staff Recruitment and Training

The Department has arranged its own training programme in the following areas: Exhibit 86/11.

(*a*) *Data Processing Operators*

We were informed that large numbers of operators are required and that facilities for this type of training are not available from any other source. Approximately 260 operators have been trained or are being trained. Q. 1259. Q. 1230.

(*b*) *Programmers-in-training*

Basic training of programmers is undertaken on behalf of the Department by the Bureau of Census and Statistics. We were informed, however, that for two periods of approximately 10 weeks duration each, these trainees are given departmental in-service instruction interspersed with formal lectures on departmental procedures and requirements in the A.D.P. field. The whole of this training course is oversighted by the Public Service Board. Q. 1215.

(*c*) *Programmers*

We were informed that the Department found it necessary to provide supplementary training for officers who had completed the Public Service Board's Systems Course. This additional training has consisted of a further course of two weeks duration in FORTRAN which is the programming language that has been adopted for the Department of Health applications. Only one such course has yet been undertaken by the Department but we were informed that resources will be allocated to other courses as the need arises. Q. 1233.

146. In addition to the specific training referred to above the Department informed us that particular attention has been paid to the problem of educating all staff generally for the introduction of A.D.P. and of keeping all staff informed of the progress towards implementation. This has been done by special news letters, continuing progress reports in the departmental monthly news bulletin and the frankest possible discussions of A.D.P. and its implications at all levels of the Department. Exhibit 86/11.

147. Mr Searle informed us that the Department's own organisation has been the main source of recruitment of A.D.P. personnel. Asked whether he considered it preferable to train local staff rather than recruit from overseas, he pointed out that the Department had had virtually no success in recruiting overseas and on that basis the approach that had been adopted was clearly preferable. In this connection we noted a reference in the departmental submission to the fact that the costs associated with the recruitment of staff overseas amounted to $2,700 and that only one member of the A.D.P. Section had been recruited in this manner. Mr Searle explained that this officer represented the Department's net gain Q. 1233. Exhibit 86/11. Q.'s 1231 and 1232.

from its participation in three overseas recruiting campaigns and that the overseas recruit concerned had only recently commenced duty with the Department. Prior to his appointment he had not been engaged in work comparable to the Australian National Health Scheme and had had no experience in the type of computer equipment used by the Department.

Q. 1233. 148. He stated that since January 1966 the Department has been making the maximum possible use of the Public Service Board's Programmer-in-training course and in his opinion this will provide the main source of the Department's A.D.P. personnel in the future.

(vii) Capital and Operating Costs

Exhibit 86/11. 149. Capital and operating costs incurred by the Department in the introduction of A.D.P. are summarised in the following tables:

TABLE No. 15

Department of Health

Capital Expenditure to 30 June 1966

Item	Expenditure	
	$	$
Data Preparation Equipment—		
Typetronic Units (6)	27,768	
Paper Tape Spools	4,040	
Tape Racks	247	
Splicers and Manupunches	751	
Tape Winders	594	
		33,400
Buildings	..	44,300
Other capital costs	..	20,400
		98,100

TABLE No. 16

Department of Health

Operating Costs to 30 June 1966

Item	Expenditure	
	$	$
Maintenance—		
Data preparation equipment	..	400
Buildings	..	100
Hire/rental—		
Data preparation equipment	..	67,500
Buildings	..	5,000
Other	..	1,300
Salaries and wages—		
Executive costs	82,000	
Data preparation staff	428,800	
Systems analysts and programmers ..	47,100	
Other	4,000	
		561,900
Incidentals—		
Stationery	38,800	
Freight on paper tapes, etc.	4,900	
Travelling expenses	9,300	
Miscellaneous	7,700	
		60,700
		696,900

Q. 1225. 150. In connection with the expenditure of $428,800 on salaries and wages paid to data preparation staff we asked Mr Searle if he thought that this expenditure might be proportionately reduced within the next five years as a result of new data preparation techniques. He stated that he was not aware of any development which would lead the

Department to consider changing the existing method of data preparation and he did not consider that there would be any radical departure from the present type of input equipment within five years. His only qualification of this assessment was that the Department may, within that time, examine the possibility of using data transmission links to its Western Australian and Tasmanian regional offices.

(viii) Benefits and Advantages Attributable to the Use of A.D.P.

151. Questioned as to the intangible benefits that may be attributable to the introduction of A.D.P. by the Department of Health Mr Searle informed us that one of the major reasons for introducing A.D.P. into the pharmaceutical benefits area was that the stage was rapidly being reached where it would no longer be possible to maintain the desired level of efficiency in prescription processing. He contended that the introduction of A.D.P. has rectified this situation and has also improved the service to chemists generally. As evidence of this he cited the July 1966 issue of the publication the "Federal Guild Contact" in which Mr R. Feller, Chairman of the Guild's National Health Sub-Committee, who had visited the A.D.P. installation and had seen the system in operation, was reported to have said: Q. 1243.

> "I was most impressed by the magnitude of the whole operation. There is no doubt that our members can rely completely on the efficiency of this new system of pricing their prescriptions."

Quoting from the same publication:

> ". . . Sub-Committee left the operational centre . . . well satisfied that the computer pricing of claims has been programmed by Departmental officers to meticulously observe details of the pricing arrangements agreed upon with the Guild and that chemists will find this new type of return can be easily checked for details of amounts paid for every item."

Mr Searle added that under the manual system it was impracticable to provide a chemist with any details relating to his claims unless he was prepared to visit the Department. Under the automatic system he is furnished with sufficient details to enable him to undertake whatever checking he may require. Q. 1243.

(ix) Future Development of A.D.P. Systems

152. In regard to the forward planning of A.D.P. applications Mr Searle stated that the Department takes the view that it will ultimately require its own computer facilities. He added that in the meantime the Department's needs are being catered for by the Bureau of Census and Statistics. In connection with the projected development of A.D.P. procedures within the Department he informed us that there is a wide range of activities where large volumes of data must be processed e.g. the pensioner medical service, the medical benefits scheme and drug reaction and toxicology reporting. Mr Holgate informed us that the Department intends to convert these procedures to A.D.P. as soon as practicable and in particular he stated that it was hoped that a start would be made on the pensioner medical services procedures early in 1967. In this context Mr Searle added that the Department hoped to complete the pensioner medical service within 9 months of commencement. He indicated that the medical benefits scheme would then be examined but in this application the problems associated with the preparation of data outside departmental control do not exist to the same extent as in the pharmaceutical benefits scheme. He expressed the view that beyond the pensioner medical service the introduction of other applications depends upon a number of factors of which available computer capacity was one of the most critical and that large scale applications such as the medical benefits scheme would be beyond the processing facilities that are available at the present time. In this connection he pointed out that the Bureau of Census and Statistics has not indicated that it can accept the medical benefits project. He emphasised that the total computer time commitment for the pharmaceutical benefits scheme alone could be of the order of one shift on the Bureau's central installation (the C.D.C. 3600/3300 configuration) and two shifts on a computer of the C.D.C. 3200 type. Q. 1197. Q. 1245. Q. 1247. Q. 1268.

CHAPTER 7—SUMMARY OF EVIDENCE AND CONCLUSIONS

153. This Report relates to the computer system installed by the Bureau of Census and Statistics and includes evidence taken from the Department of the Treasury, the Taxation Branch, the Superannuation and Defence Forces Retirement Benefits Boards and the Department of Health, all of which are operating on the Bureau's network. Throughout the Report a uniform format has been preserved as far as possible for the presentation of evidence by each of these departments and authorities. A similar format has been used in this chapter for the summation of evidence and statement of conclusions.

(i) Historical Background

154. The Bureau of Census and Statistics commenced its evaluation of A.D.P. with studies undertaken in 1958-59 in the United States of America, Britain and Canada. It completed a detailed analysis of the potential use of A.D.P. equipment during the period 1960 to 1962. Reports on these feasibility studies were reviewed by the Public Service Board and the Inter-departmental Committe on A.D.P. in May 1962. The Treasurer's approval of the Bureau's proposal was obtained in August 1962 and after the formal issue of specifications by the Commonwealth Stores Supply and Tender Board in June 1963 the first of the six installations was accepted by the Bureau in December 1964.

155. The Bureau's network comprises a large scale installation in Canberra and five smaller installations in all State capitals except Hobart. The installations are not linked by transmission equipment although this possibility was examined when the specifications were issued. In 1966 the capacity of the various installations was expanded due mainly to the speed of implementation of much of the work and the fact that, earlier, the requirements of departments intending to utilise the Bureau's A.D.P. facilities could not reasonably be anticipated. The Equipment installed by the Bureau was said to comprise the largest complex of computer installations in Australia.

156. The central Treasury A.D.P. section was formed about two years ago by the recruitment of four experienced A.D.P. officers from Britain. Since that time progress has been made in converting punched card and other systems to the Bureau's computer. Despite staff shortages the section has been able to meet the essential requirements of the Department and significant elements of Treasury accounting work in Canberra, Sydney and Melbourne are now being processed on computers. The use of the Bureau's computer installations by the Budget and Accounting Branch of the Department was said to be an appropriate continuation of an established practice. The accounting requirements of the Department were taken into consideration in determining the extent of equipment to be acquired by the Bureau.

157. In the case of the Taxation Branch, an exploratory study had been completed and a feasibility study was nearing completion when, in April 1963, following discussions with the Public Service Board, Department of the Treasury and the Bureau of Census and Statistics, it was agreed in principle that the possibility of processing Taxation Branch work on the Bureau's network would be examined. It was claimed that, generally the decision to use the Bureau's equipment did not result in any major additional expenditure by the Taxation Branch which would not have been eventually incurred. On the other hand, it ensured an earlier entry by the Branch into automatic data processing and should ensure a speedier and less costly specification of suitable equipment for the needs of the Branch should such a course be undertaken.

158. The use of the Bureau's A.D.P. equipment by the Superannuation and Defence Forces Retirement Benefits Boards was not attributable to a single specific decision. The Bureau had undertaken work on behalf of the Boards since 1923 and this arrangement had developed progressively over the years. It was therefore taken for granted that the work concerned should continue with the Bureau into the A.D.P. field and this work was taken into consideration by the Bureau in its preliminary systems analysis. Although the Branch was not directly involved in decisions connected with the type of equipment installed and software support acquired by the Bureau, extensive formal and informal negotiations occurred between the Boards and the Treasury. The availability of the Bureau's equipment coincided with the requirements of the Boards.

159. The initial introduction to the use of A.D.P. by the Department of Health was its participation in a working part, appointed in 1961 by the Inter-departmental Committee on A.D.P., the main purpose of which was to establish the Commonwealth-wide potential for computing facilities. In May 1962 the Department requested, as an interim measure, that its processing be undertaken on equipment proposed for the Bureau of Census and Statistics but without prejudice to its right to seek its own computer facilities at a later stage. The Bureau provided assistance to the Department in respect of exploratory work associated with the introduction of A.D.P. in the pharmaceutical benefits area.

(ii) Development and Implementation

160. Because the Bureau of Census in the United States of America had demonstrated the practicability of processing statistical and administrative data on computers, the Commonwealth Bureau of Census and Stastics did not carry out an exploratory study but proceeded direct to a feasibility study, which involved between five and eight officers and cost $61,600.

161. In its approach to implementation the Bureau was influenced by the need to dispense quickly with hired punched card equipment which at that time involved an annual cost of $317,000. It was claimed that in these circumstances a progressive implementation of applications was adopted. The success of this approach was said to be demonstrated by the fact that forty-one applications had reached operational status within two and a half years of acceptance of the first installation. The Bureau considers that the experience gained from the progressive implementation of a wide variety of work will lead to the creation of integrated systems of even greater value.

162. In the case of the Department of the Treasury, exploratory and feasibility studies were made and incorporated in the feasibility study undertaken by the Bureau of Census and Statistics.

163. As at 30 June 1966 the Department of the Treasury had developed or was in the course of developing ten A.D.P. applications.

164. Of the priority projects under immediate consideration 13 per cent were in full operation at the time of our inquiry. Proposals for the conversion of specific manual accounting procedures to A.D.P. is expected to be implemented over a period of two years.

165. In the case of the Taxation Branch, an exploratory study was commenced in November 1960 by four officers and following the establishment of an A.D.P. organisation within the Branch by the Public Service Board a feasibility study group recommended the introduction of A.D.P. using the Bureau of Census and Statistics network. The feasibility study was of eighteen months duration and its cost, together with that of the exploratory study, amounted to $300,386. The feasibility study was undertaken on a 'fully integrated' approach in accordance with the views of the Public Service Board and the Inter-departmental Committee on A.D.P.

166. The projects listed in the initial implementation schedule covered two large scale areas in terms of volume and both reached operational status as scheduled.

167. The Taxation Branch feasibility study had estimated that savings of $2,348,600 should be achieved following the introduction of A.D.P. Although the Branch has made some calculations of comparative operating costs in respect of procedures converted to A.D.P. it was unable to demonstrate overall savings from the use of computers and was unable to give an accurate estimate as to when the costs associated with the introduction of A.D.P. might be recovered.

168. In the case of the Superannuation and Defence Forces Retirement Benefits Boards exploratory and feasibility studies were not undertaken as formal investigations as its accounting systems had, over a long period of time, been designed to permit advanced mechanisation. In these circumstances and because the Boards were not required to draft a hardware specification it was claimed that the necessity for such studies was eliminated.

169. As at 30 June 1966, the Boards had implemented or partially implemented eight applications and had a further nine applications under development. Details of these applications are set out in Tables Nos. 11 and 12.

170. In the case of the Department of Health, a feasibility study relating to the Pharmaceutical Benefits Scheme was undertaken between August 1962 and March 1963 at a cost of $5,000.

171. The A.D.P. system for pharmaceutical benefits was introduced in Queensland in July 1965 and adopted in New South Wales, South Australia and Western Australia in July 1966. This gradual approach to implementation was adopted to obviate disruption to the payments processing and to co-ordinate a number of factors including machine acquisition and staff recruitment and training. The successful implementation of the scheme also required that doctors and pharmacists should be aware of the new method of processing.

172. In March 1965 the Department introduced computer analysis of biological assays undertaken by the National Biological Standards Laboratory and, as indicated above, introduced pharmaceutical benefits payments (a Management Control Information System) on 1 July 1966. It proposes to conduct a continuing survey in January 1967 into the effects on children's teeth of fluoride introduced into the Canberra water supply. The Department expects the pharmaceutical benefits payments system to be fully operative in all States by July 1967.

173. Your Committee is satisfied that the departments and agencies currently operating on the computer network established by the Bureau of Census and Statistics developed, through exploratory and feasibility studies, an acceptable approach to the implementation of A.D.P. In the case of the Bureau itself, Your Committee regards the initial study undertaken in conjunction with the Bureau of Census in the United States of America as a valid approach to the conduct of a feasibility study. Your Committee also accepts as sound, in the circumstances, the eventual incorporation of exploratory and feasibility studies for the Superannuation and Defence Forces Retirement Benefits Boards within the studies carried out by the Bureau.

174. As the Bureau of Census and Statistics had completed its exploratory and feasibility work in 1962, Your Committee believes that had a decision been taken at an earlier stage for the Taxation Branch work to be placed on the Bureau's computer, the Bureau would have been able to assess more precisely, during its feasibility stage, the range of applications which might be required.

(iii) Administrative Arrangements Between the Bureau and User Departments and Organisations

175. Apart from the programme development and production running associated with the compilation of statistics, the Bureau provides computing facilities for the Budget and Accounting Branch of the Treasury; the Taxation Branch; the Superannuation and Defence Forces Retirement Benefits Boards and the Departments of Health, Supply, Civil Aviation and Repatriation and the Public Service Board. Of the 22,431 hours of operation of the network to 31 May 1966, Bureau applications accounted for 14,479 hours; Treasury applications for 2,278 hours; Taxation Branch applications for 2,290 hours; Superannuation and Defence Forces Retirement Benefits Boards applications for 856 hours; Department of Health applications for 2,181 hours and other users 347 hours.

176. The existing arrangements which were envisaged in concept when the hardware specification was drafted, involved the allocation of computer time based on negotiations between the Bureau and users. In practice the Bureau provides the computer and ancillary equipment and operating staff, etc. and clients are responsible for systems design, data preparation and, where accountable stationery is used, paper handling facilities. The Bureau allots blocks of time and provided there is no idle capacity or obvious time waste, has no jurisdiction over the use made of time allotted.

177. Scheduling problems involving the fixing of priorities had to be resolved especially during the initial stages of production running but this was said to have been materially assisted by the co-operation of users. The Bureau stated that a situation has not yet arisen where two or more departments have claimed equal priority for urgent processing of data. So far any urgent requests for computer time by clients have been met by a re-arrangement of the Bureau's own programme.

178. The Budget and Accounting Branch of the Treasury proposes to utilise the Bureau's network for the remaining 87 per cent of its specific A.D.P. applications over the next two years, provided sufficient computer capacity is available. It is expected that the future requirements of the Budget and Accounting Branch in terms of computer time will be fairly extensive. We note Mr Hill's comment that although at present client departments negotiate computer time with the Bureau it should not be implied that the Budget and Accounting Branch is prepared to leave future planning entirely with the Bureau and suggested that a 'Users Committee' to advise the Bureau on the allocation of time might be preferable to the existing practice of bilateral consultation. He stressed that while all users should be represented on such a Committee, it should be advisory only and the final decision should be taken by a single authority in the interests of efficient management. In this regard we note Mr Pridmore's comment that a proposal along the lines mentioned is currently under consideration and that a conference of users will be convened to examine the whole question of computer capacity in relation to user needs.

179. It would appear that the joint use of A.D.P. equipment has not presented any real administrative problems to the Taxation Branch. The evidence indicated that the Bureau has been co-operative. Estimates of time by the Branch are advised to the Bureau and mutual agreement as to time allocation is reached by negotiation.

180. It appears that in the case of the Superannuation and Defence Forces Retirement Benefits Boards, special tasks such as changes made in payments of pensions in 1959 and the adjustment of the quinquennial surplus as at 1962 have made it necessary for the Branch to concentrate its A.D.P. activities on short-term needs in relation to its use of the Bureau's computers.

181. The Department of Health claimed that its use of the Bureau's A.D.P. equipment had proved particularly satisfactory and the Bureau had done its utmost to ensure that its requirements are met.

182. Your Committee notes that at present the allocation of computer time is undertaken by the Bureau and that, generally, users have been able, so far, to negotiate changes which they require to make in their time allocations. We also note that due to the future expected requirements of the Budget and Accounting Branch of the Department of the Treasury a change in the method of time allocation may be required. In this regard we believe that careful consideration should be given to the proposal for the establishment of a Committee of Users to advise the Bureau. The use of such a Committee would ensure that users of the Bureau's equipment, as well as the Bureau itself, are kept fully informed of the nature and extent of applications which are currently placed on the computers and those which are in prospect.

(iv) Management Structure

183. The highest level officer whose responsibilities are wholly involved in A.D.P. systems is an Assistant Statistician in the case of the Bureau of Census and Statistics; a Director in the case of the Central Treasury; a Director in the case of the Taxation Branch; a senior Programmer in the case of the Superannuation and Defence Forces Retirement Benefits Boards and a Director in the case of the Department of Health. These positions vary somewhat in their relationship to the Permanent Heads of the organisations concerned.

184. Whilst noting the variations in management levels applying between the Departments and agencies concerned, your Committee considers that it would be premature to form any judgment on them until the corresponding levels have been examined in other Commonwealth networks.

(v) Management Training

185. We note that in the case of the Bureau and the Taxation Branch, considerable attention has been paid to management training in A.D.P. In the former case, the Commonweath Statistician has directed his senior officers to undergo courses of training in this field. In the latter case conferences and courses ranging from one to fourteen days duration have been provided for senior staff from the level of Commissioner down to the Director of the A.D.P. Branch.

(vi) Staff Recruitment and Training

186. In the case of the Bureau a total of forty-one experienced officers were recruited from Britain during the first three or four years of the Bureau's A.D.P. operations at a cost of $88,000. Of these, twelve had resigned at the time of our inquiry due mainly to inadequate salaries and lack of promotional opportunity.

187. In the case of the Budget and Accounting Branch of the Department of the Treasury, fifteen A.D.P. staff have been recruited from Britain at a cost of $31,800. Of these, two had resigned at the time of our inquiry.

188. Twelve A.D.P. officers have been recruited by the Taxation Branch from Britain at a cost of $21,040 and as at 30 June 1966, four of these had resigned.

189. One officer has been recruited from overseas by the Superannuation and Defence Forces Retirement Benefits Boards at a cost of $300 and one officer has been recruited by the Department of Health from overseas at a cost of $2,700.

190. On the basis of this evidence, seventy A.D.P. officers have been recruited from overseas by the Bureau and departments and agencies operating on its network, at a cost of $143,840. Of these, eighteen had resigned at 30 June 1966.

191. The Bureau considered that while overseas recruitment had proved costly, it could not otherwise have reached its present level of achievement. The growth of knowledge and experience in Australia was said to have now reached the point where the need to recruit staff from overseas had been substantially reduced. The Taxation Branch however, saw advantages in recruiting A.D.P. staff from overseas and, in terms of the need to achieve cross-fertilisation of ideas, agreed that advantages would accrue from the overseas posting of locally-trained officers. The Department of Health claimed that it had had practically no success in attracting staff from overseas countries.

192. In regard to training, the policy of the Bureau is to seek proficiency and experience rather than staff numbers. Programmer-in-training courses conducted by the Bureau are designed to provide a continuing supply of trained personnel. To date 139 programmers and seventy-nine computer operators have been trained by the Bureau and a number of other specialised courses provided.

193. The Budget and Accounting Branch of the Department of the Treasury initially arranged for new appointees to its A.D.P. Section to attend one of the basic FORTRAN courses held periodically by the Bureau or by C.S.I.R.O. Subsequently all staff joining the Section and having previous experience and training in A.D.P. were required to undergo a six-months familiarisation and training course in basic FORTRAN programming. The Section also undertakes the training of Sub-Treasury staff required to operate production systems. Four trainees were enrolled on a Programmer-in-training course conducted by the Bureau of Census and Statistics on behalf of the Public Service Board in 1964 and this number was increased to eleven in 1965. Nine officers undertook the course in 1966.

194. In the case of the Taxation Branch staff, training has been provided internally within the Branch for 2,157 officers and externally by the Public Service Board (seventy-six officers), the Bureau of Census and Statistics (fifty officers), the Department of Defence (three officers) and Machine companies (sixteen officers). The training provided ranged from data preparation courses and Programmer-in-training courses to management and language training courses.

195. Two officers of the Superannuation Branch have completed a programming course of six weeks duration conducted by the Bureau of Census and Statistics whilst two other officers qualified as programmers from the 1965 Programmer-in-training course conducted by the Bureau on behalf of the Public Service Board. These courses, supplemented by in-service supervision and assistance given by the Programmer-in-charge were said to be adequate.

196. The Department of Health has arranged its own training programmes for data processing operators. It claimed that it had found it necessary to provide supplementary training for officers who had completed the programming training organised by the Public Service Board. In addition, particular attention has been paid to the problem of educating all staff generally for the introduction of A.D.P. and keeping all staff informed of the progress made towards implementation.

197. Your Committee notes that while recruitment of A.D.P. staff from overseas sources has evidently been necessary in the early stages of the implementation of A.D.P., the cost of such recruitment has been substantial. This situation emphasises the need for the A.D.P. training programmes provided by the Public Service Board, the Bureau and departments to be of the highest quality and sufficiently extensive to reduce recruitment from overseas to a minimum.

198. The evidence shows that a wide variety of training is being provided by the departments currently using the Bureau's computers, partly in response to their individual needs, and that basic training, particularly for programmers is being undertaken by the Bureau on behalf of the Public Service Board. Your Committee invites attention to the conclusions it reached in paragraph 362 of its Eighty-fifth Report and trusts that the Public Service Board, in its co-ordination role, will ensure that the courses provided by the departments currently under examination are efficiently integrated to provide maximum effective training at minimum cost.

(vii) Capital and Operating Costs

199. Summaries of capital expenditure and operating costs of the Bureau of Census and Statistics network to 30 June 1966 are set out in Tables Nos. 17 and 18.

TABLE No. 17

BUREAU OF CENSUS AND STATISTICS NETWORK

Capital Expenditure to 30 June 1966

Item	Bureau of Census and Statistics	Department of the Treasury	Super-annuation and D.F.R.B. Boards	Taxation Branch	Department of Health	Total
	$	$	$	$	$	$
Central Processing Unit and ancillary equipment	5,264,300	..	..	..	..	5,264,300
Data Preparation and Transmission equipment	223,600	65,400	..	23,132	33,400	345,532
Construction and modification of Buildings	799,200	..	..	34,093	44,300	877,593
Other Capital Expenditure ..	107,500	..	..	47,659	20,400	175,559
Total	6,394,600	65,400	..	104,884	98,100	6,662,984

TABLE No. 18

BUREAU OF CENSUS AND STATISTICS NETWORK

Operating Costs to 30 June 1966

Item	Bureau of Census and Statistics	Department of the Treasury	Super-annuation and D.F.R.B. Boards	Taxation Branch	Department of Health	Total
	$	$	$	$	$	$
Maintenance—Central Processing Unit and Ancillary equipment ..	312,100	..	..	..	..	312,100
Maintenance—Data Preparation Equipment	..	..	..	290	400	690
Maintenance—Buildings	7,000	..	..	7,967	100	15,067
Hire/Rental—Central Processing Unit and Ancillary equipment ..	38,400	..	..	..	..	38,400
Hire/Rental—Data Preparation equipment	220,600	4,600	16,485	90,466	67,500	399,651
Hire/Rental—Buildings	17,100	..	..	91,840	5,000	113,940
Salaries and Wages	1,513,000	327,000	398,250	725,559	561,900	3,525,709
Power	40,000	..	..	3,942	..	43,942
Incidentals	415,700	500	22,000	180,755	62,000	680,955
Total	2,563,900	332,100	436,735	1,100,819	696,900	5,130,454

200. In regard to Table No. 18 your Committee notes the relative significance of salaries and wages, incidental expenses and maintenance costs attributable to the central processing unit and its ancillary equipment. As indicated in our Eighty-fifth Report, the information set out in these tables and obtained readily from the departments concerned, should prove useful in the formulation of economic studies of achievements for Commonwealth A.D.P. installations.

(viii) BENEFITS AND ADVANTAGES ATTRIBUTABLE TO THE USE OF A.D.P.

201. Your Committee noted that, generally, little tangible evidence was submitted by witnesses relative to the benefits or the advantages which had been obtained from the use of A.D.P.

202. The Bureau of Census and Statistics referred to improvements made in the service which it provides to users of statistics and the fact that tasks can now be undertaken beyond the capacity of older types of equipment. It also instanced specific savings of $155,000 per annum on hiring of equipment and staff savings of $110,000 per annum.

203. The Taxation Branch stated that some procedures had resulted in savings but in other areas of its operations it had found that expenditure incurred had exceeded the level it would have reached without the introduction of A.D.P. The witness agreed, however, that an early approach should be made to the measurement of savings achieved from the use of A.D.P. He estimated that savings amounting to $76,263 per annum had been achieved in New South Wales, Victoria and South Australia as a result of processing tax collection instalments on computers, whilst a further annual saving of $83,650 had resulted from the proposal by the Treasury to reconcile drawing accounts for those offices.

204. The Superannuation and Defence Forces Retirement Benefits Boards claimed that the development of A.D.P. techniques has provided basic records which will be of assistance to the Commonwealth Actuary and for other purposes and has resulted in a lesser increase in staff than would otherwise have been required.

205. The Department of Health claimed that under its previous system of operation in the pharmaceutical benefits area the stage was being reached where it would no longer be possible to maintain the desired level of efficiency in prescription processing and that the introduction of A.D.P. had rectified this situation.

206. The nature of the evidence received in this field reinforces the views expressed by Your Committee in paragraph 365 of its Eighty-fifth Report that the undertaking of economic studies of achievements for each Commonwealth A.D.P. installation would prove to be a valuable task and might well elucidate whether or not optimum use is being made of equipment.

(ix) Future Development of the Bureau Network.

207. The Department of the Treasury indicated that its forward planning is, at this stage, limited to conversion of the specific systems in the current programme in accordance with the schedule of target dates set for each project. No termination of the present relationship with the Bureau was considered likely unless such a course was mutually agreed upon.

208. In the case of the Taxation Branch the present level of processing comprises only a small fraction of its total proposed system which will include recording and indexing systems, a complete accounting system and the extension of A.D.P. to sales tax, payroll tax and estate and gift duties. The Branch is examining the possibility of establishing its own computer installation and stated that whether or not the Bureau could continue to provide sufficient computer time to enable the Branch to extend its A.D.P. systems is the critical factor in that decision.

209. The evidence suggests that the Bureau's equipment may not be suitable for the type of systems envisaged by the Superannuation and Defence Forces Retirement Benefits Boards e.g. systems incorporating real time interrogation facilities. Whether or not the Boards would acquire their own computers was said to depend partly on whether the Bureau's network is expanded to include instantaneous inquiry facilities and partly on necessary consultations with the Department of the Treasury and other organisations directly concerned.

210. In connection with projected A.D.P. developments in the Department of Health it appears that there is a wide range of activities, such as the pensioner medical service, medical benefits scheme and drug reaction and toxicology reporting, where large volumes of data must be processed and which the Department desires to convert to A.D.P. as soon as practicable. Implementation beyond the medical benefits scheme, however, was said to depend on several factors of which available computer capacity is a critical element. The Department expects to install its own computer ultimately.

211. As at July 1966 the Bureau's computers were operating on three shifts in Canberra and Sydney, two shifts in Melbourne and Adelaide and one shift in Brisbane and Perth, per five day week. By December 1966 the Bureau expects that three shifts will be worked on its computers located in Melbourne and two shifts in Brisbane and Perth. Indications which it gave suggest that it may not be possible to meet the whole of its clients' requirements by the end of 1967 and that the probable extension of existing applications within the Bureau itself would reduce the computer time available for clients. Mr Archer informed us that if applications continue to exceed those anticipated when the equipment was ordered, some additions will be necessary to cope with extended work loads.

212. It appears that in the near future the Public Service Board intends to make a detailed examination of long-term proposals. This will involve inter-departmental consultations designed to determine whether additional installations should be established or whether existing facilities, such as the Bureau network, should be extended.

213. The evidence suggests that within the foreseeable future either the growth of applications by the Bureau and its clients will place a heavy demand on the Bureau's equipment. Some clients will be unable, in the long term, to proceed to full implementation of their A.D.P. applications, unless satisfactory alternative arrangements are made for them.

Three basic approaches to this problem have been suggested. The first and apparently simplest, is to establish a large number of computer installations on a regional basis and the third is to establish a complex of very large scale computing centres operating as Service Bureaux for Commonwealth departments generally.

214. In regard to the problems referred to and the solutions proposed, we note with approval that the Public Service Board intends in the near future to undertake, in consultation with the departments, a detailed examination of proposals for the establishment of additional computer installations or the extension of existing facilities such as the Bureau network. This examination will embrace the possible establishment of a separate 'Bureau of Information Processing' which could possibly provide computing facilities for a group of departments which do not at present have their own computing equipment. We would commend the Board for this imaginative approach to what is clearly a complex problem.

For and on behalf of the Committee

RICHARD CLEAVER,

Chairman

David N. Reid,
Secretary,
Joint Committee of Public Accounts,
Parliament House,
Canberra, A.C.T.
19 October 1966.

INDEX TO EXHIBITS

The following Exhibits were tendered in evidence at the Inquiry into Automatic Data Processing and relate to this Report. Those marked with an asterisk are directly relevant to this Report.

Exhibit No. 1—Submission by IBM Australia Pty. Ltd.
Exhibit No. 2—Submission by Control Data Australia Pty. Ltd.
Exhibit No. 3—Submission by Honeywell Pty. Ltd.
Exhibit No. 4—Submission by Dr. J. A. Ovenstone, Professor of Computing Science, University of Adelaide.
Exhibit No. 5—Submission by G. N. Lance, M.Sc., Ph.D., A.F.R.Ac.S.
Exhibit No. 6—Submission by Australian Computers Pty. Ltd.
Exhibit No. 7—Submission by International Computers and Tabulators Australia Pty. Ltd.
Exhibit No. 8—Submission by the Department of the Treasury.
Exhibit No. 9—Submission by the Commonwealth Public Service Board.
Exhibit No. 10*—Submission by the Taxation Branch.
Exhibit No. 11*—Submission by the Department of Health.
Exhibit No. 12*—Submission by the Department of the Treasury.
Exhibit No. 13*—Submission by:
The President, Superannuation Board, and The Chairman, Defence Forces Retirement Benefits Board.
Exhibit No. 14*—Submission by the Bureau of Census and Statistics.
Exhibit No. 15*—Submission by the Department of the Treasury.

Printed and Published for the GOVERNMENT of the COMMONWEALTH OF AUSTRALIA by
A. J. ARTHUR, Commonwealth Government Printer, Canberra