

A Comparative Analysis of Australian and Japanese  
Companies in the Australian Electronics  
Manufacturing Industry

Yasuo Hoshino  
David A. Varvel

"OIKONOMIKA" Vol. 23, No. 3 · 4, March, 1987  
Society of Economics Nagoya City University Japan

## A Comparative Analysis of Australian and Japanese Companies in the Australian Electronics Manufacturing Industry

Yasuo Hoshino and David A. Varvel\*

### INTRODUCTION

During the last 15 years the Australian electronics manufacturing industry has undergone profound changes. During the mid 1970's changes made to the Australian Government's import tariff policies resulted in a sharp decline in the industry.<sup>1)</sup> It has only been in the last half dozen years that the industry has begun to recover from this decline and during this time several Japanese companies have consolidated their position in the manufacturing industry.

It is the purpose of this paper to examine the differences and similarities between Australian and Japanese companies presently operating in Australia. Generally there are significant differences between the operations of Australian and Japanese companies in Australia and this is to be expected. What perhaps was not expected was the disparity between the levels of research and development performed by Australian companies and even those Japanese companies whose manufacturing activities in this country are considerable. It will be this aspect of the company's activities which will be used to highlight the changes that are currently occurring in the industry.

---

\* This paper is a revised version of a research report submitted by the latter as a partial fulfilment of a course "Contemporary Japanese Business", lectured and tutored by the former for Master of Commerce students of the University of New South Wales at the Session II, 1986.

1) In July 1983 the Whitlam Labour Government of Australia cut all import tariffs by 25%. The effect of this tariff cut was to cause a large reduction in the components industry. As the components manufacturers could not cope with such a large reduction in their industry the net income of the companies in this industry fell from \$A13,000,000 in 1973 to \$A4,000,000 in 1976. Overall employment in the components industry fell from 35,000 in 1971 to 20,000 in 1980. The Electronics Industry Advisory Council [14]

To obtain data for this paper questionnaires were sent to a selection of Australian and Japanese companies. These are listed in Appendix A.

### THE AUSTRALIAN ELECTRONICS INDUSTRY

The size of the industry in Australia is quite large even when the relative size of the population is considered. (15.6 million.) The communication industry which would be the largest sector of the industry had 1986 sales of over \$A1,400 million. Page-Hanify [12]. This sector is currently growing at a rate of 18% and this is increasing. The Australian electronics industry exported over \$A500 million worth of products in 1985 and the consumption of imports in the same period was approximately \$A3,000 million. Local production of colour television and consumer appliances is estimated at \$A500 million per annum.

The involvement of Japanese companies in the manufacturing industry in Australia is limited mainly to the import and sale of finished goods into the country and the local assembly of colour television sets and some hi-fi components. This policy of Japanese companies results in practically no local component industry involvement with local assembly being done from kits of fully imported components. There are a few exceptions, especially in the communication and computing industry, but generally these are exceptions and not the rules.

When discussing Japanese companies in Australia it is important to understand how they are structured. They are not carbon copies of their parent in Japan but obviously some of the Japanese managerial style is transferred to Australia.

### THE JAPANESE COMPANY IN AUSTRALIA

In a previous survey by Varvel [15] of Japanese companies in Australia it was found that the average company surveyed employed 21 Japanese nationals. The size of these companies varied from 50 to over 2000. The survey was designed to analyse business practice of those companies that were engaged in manufacturing operations in Australia and in analysing the data an interesting picture of the companies emerged.

The Managing Directors of the companies usually stay for a short term with the average length of stay at 4 1/4 years. In almost all cases the Managing Directors

had initially joined the company from University and had worked for the same company for 25 years on average before being appointed to the position that they held in Australia. Approximately one third of the Managing Directors had worked for the company in countries other than Australia or Japan. All of them had University degrees with an approximate 50/50 split between Engineering and Economics/Law degrees. In this respect the Japanese executive is cast in a similar mold to his counterpart in America and France. Ozawa [11]. The management structure of Japanese companies operating in Australia is for the most part a hybrid operating with elements of Japanese and Western management methods. Of the companies surveyed in the above study only 11 percent of respondents indicated that their company operated a totally Japanese management.

In studying the management style an indicative sign is the use of the Ringi style of formalised decision making. A paper by Ichimura [8] has shown that the Ringi system was only used on average in 30 percent of the Japanese subsidiaries throughout Asia. It was assumed from this data that there would also be a low incidence of the use of the Ringi system in Australia. It was found, however, that 78 percent of Japanese firms in Australia utilised this system and of these firms 56 percent had adapted its use to suit the local business environment. It appears that the widespread use of the Ringi system in these firms operating in Australia is probably due to the extent of local adaptation of the system that has been achieved.

The following four major points were apparent from the survey

- 1 Considerable autonomy exists in the Australian offices of the Japanese companies, however the overall management structure while modified to suit Australian conditions is tightly controlled by the Japanese management.
- 2 Regular training of non Japanese staff is highlighted by most companies with all companies sending designated staff to Japan for head office training.
- 3 The Ringi or group decision process is used by most companies but its use has been modified to suit Australian work practices.

- 4 The most common company objective is increased profit within Australia and most hope to achieve this by increased product sales created by new products and product differentiation.

## THE JAPANESE ELECTRONICS COMPANY

In contrast to other industries there is only a small representation in Australia of Japanese Electronics Manufacturing Companies (JEMC's). Our research has only found 5 JEMC's currently operating in Australia and the areas in which they manufacture are colour television, hi-fi speakers and telecommunications equipment. Total annual sales for these companies is in the order of \$A600 million. (Data taken from present survey.)

## SURVEY RESULTS

### 1 COMPANY STRUCTURE

The results of the survey of EMC's has resulted in some interesting comparisons between the Australian and the Japanese companies that were surveyed. The Australian companies surveyed were all 100% owned by Australian interests and only 3 of the companies were stock listed companies.<sup>2)</sup> The Japanese companies surveyed are all subsidiaries of parent companies in Japan and operate in Australia with some senior Japanese staff and the majority of the workforce are Australians.

The average staffing ratios of these companies can be seen from the following Table 1.

Total sales for the Australian companies surveyed is \$A193 million and of this figure \$A127 million or 65.18% is the result of export sales. The average Australian EMC has a total staff of 132 people and has annual sales in 1985 of \$A16 million giving an average figure of sales revenue per employee of \$A124,000.

2) The following classes of companies exist in Australia.

Private Companies: These companies are not listed on the stock exchange and can be owned by private individuals or other companies.

Public Companies: These are stock exchange listed companies. They are called public companies because the general public can buy shares of the company on the stock exchange.

TABLE 1 COMPANY STAFFING RATIOS

CATEGORY	NATIONALITY	AUSTRALIAN	JAPANESE
Managerial Staff		8.6%	10.7%
R & D Staff		18.6%	1.2%
Production Staff		52.9%	49.8%
Clerical and Other Staff		19.9%	38.3%

The Japanese companies surveyed had a combined sales level of \$A531 million, all of which was domestic sales within Australia. The average sales revenue per employee for the Japanese company was \$A226,342, a figure considerably higher than that of the Australian companies. The most probable cause for this is that the sales figures for the Japanese companies include sales of imported products while the figures for the Australian companies only include sales of locally manufactured products.

As part of the survey several questions were asked to gauge some aspects of company policy. The respondents were asked to respond to the questions by scoring their response on a scale of 1 to 5 with 1 indicating 'Definitely True' and 5 indicating 'Definitely False'. Table 2 indicates the responses to the questions.

Formalised job descriptions are used to a limited extent in both the Australian and the Japanese companies both of which scored a mean response of about 2.3. There is little significant difference between these results. As each company group is operating in the same business environment this result is not surprising.

Same trend is observed in the responses for the question regarding career paths for middle management and R&D staff. The reasons for this would appear to be similar to the reason for the first proposition.

Most of the Australian companies surveyed showed a strong bias towards export. Seven of the respondents indicated in the affirmative that they were Export Driven. As would be expected the Japanese companies' responses were almost exactly opposite to that of the Australian companies with a mean response of 4.7 compared to 2.2 from the Australian responses.

**TABLE 2 COMPANY POLICY RESPONSES**

PROPOSITION	AUSTRALIAN		JAPANESE	
	Mean	Std. dev.	Mean	Std. dev.
Formalised job descriptions are used throughout the company.	2.3	.8	2.2	.4
Career paths for middle management and R & D staff are clearly defined.	3.2	1.0	3.2	.5
The company is Export Driven.	2.2	1.2	4.7	.5
Individual decision making is more important than group agreement.	2.5	1.0	3.0	1.2
Staff performance is regularly appraised by a formalised Management By Objective procedure.	2.7	1.3	2.3	1.2
Total quality control and quality circles operate throughout the company.	3.3	1.3	2.7	.9
Senior management have regular meetings with supervisory staff.	1.5	.7	1.8	1.5
Major corporate decisions are decided by a few senior executives and issued as directives to the rest of the company.	1.8	.7	2.2	1.3
Staff numbers have been actively reduced in the last two years to reduce costs.	4.1	1.1	2.2	1.3
The company is market driven.	1.7	.8	2.2	1.5
The Just In Time system of production is in use in your company.	3.6	1.3	3.3	1.4
R & D staff are an integral part of your company structure.	1.3	.2	3.8	1.3
The company is research driven.	2.5	1.2	4.2	1.1
Senior management staff are often recruited from the R & D section.	2.8	.8	4.5	.5

Scores measured on a scale of 1 to 5 with 1 indicating 'Definitely True' and 5 meaning 'Definitely False'.

The statement that 'Individual decision making is more important than group agreement' was designed to test the difference between Japanese and western management. The means of 2.5 for the Australian companies and 3.0 for the Japanese companies show that such differences do exist although there is not a significant difference between the two groups. The mean responses of 2.7 and 2.3 for the question on Management By Objective indicates that the system is used but only 2 companies indicated that they used it as a formal company policy.

Quality Circles and TQC have generally not been yet accepted by Australian companies to the same extent as they have by the Japanese companies. This is reflected in the responses with a mean response of 3.3 for the Australian companies compared to a mean response of 2.7 by the Japanese respondents.<sup>3)</sup>

Uniform responses on the topic of management and their interaction with their supervisory staff between the Australian and the Japanese companies is reflected in the closeness of the responses, 1.5 compared to 1.8. A similar response was received to the next proposition that major corporate decisions are decided by a few senior executives and issued as directives to the rest of the company.

A large difference was seen in the response to the proposition that staff numbers have been reduced to cut costs. The Australian companies responded that they had not reduced their staff whilst the Japanese companies responded that they had. This would be due to the heavy competition in the colour television industry. With 6 companies all fighting for market share the pressure to cut costs is very strong. Both the Australian and the Japanese companies see themselves as being market driven but surprisingly the Australian companies see this more than the Japanese companies.

The use of the Just In Time production system achieved a rating of only 3.6 with the Australian companies. This method of production is only just starting to be used in Australia the high mean is indicative of this lack of adoption of the concept.

3) The introduction of TQC and Quality Circles is a recent feature of Australian industry. It is only in the last 5 years that the use of TQC has grown significantly, but it is still not yet an accepted method of industrial practice.

It is surprising that the Japanese companies operating in Australia do not in the main use this system either. The work of Hoshino and Byfield [7] has shown that while quality circles are used by 67% of Japanese manufacturing operations in Australia and, only 38% of them use Just In Time manufacturing. As approximately 90% of the components used for manufacturing colour television sets have to be imported, this is hardly surprising.

The final question on recruitment of management staff from the R&D section got a mean result of 2.8 with only one company replying that it was definitely true. In contrast the Japanese mean response was 4.5, this is a reflection on the fact that there is very little R&D done in Australia with only one company indicating that they do any local R&D. It is interesting to note that this company is looking to expand its level of R&D from its current level of \$A3.1 million to over \$A6 million by 1989. (This investment in R&D is mainly in telecommunications research.)

## 2 R&D IN AUSTRALIA

The 12 Australian companies that responded to the survey spent an average of 12.2% of their annual sales revenue on R&D during the last year. This totalled \$A16.9 million or approximately \$A10,000 per employee. This corresponds to an overall percentage of 8.3% of total sales. Only two companies indicated that they were planning to change their spending on R&D over the next three years. One company currently spending 1% has plans to increase this to 5%, and the other company that is currently spending 35% plans to reduce this to 11%. An interesting result was obtained to the question 'Has your company expanded its level of R&D activity as a result of the Government's 150% tax subsidy.<sup>4)</sup> Only two companies have indicated that this incentive was responsible for their expansion of R&D activity. Four companies have indicated that their increased level of R&D activity was due to senior management directive, two listed the success of previous products and one indicated the relative economy of R&D costs in Australia compared to operating overseas. (This company also operates an R&D center in the United States of America)

4) Since July 1985 a 150% tax concession covering expenditure on basic research, applied research and experimental development has been operational in Australia. Labour costs and other current expenditure on R&D is deductible at the concessional rate in the year in which the expenses are incurred. Expenditure on plant and equipment that is wholly attributable to R&D attracts the 150% concession over three years.

See Page-Hanify [12]

It would appear that in these companies at least the government incentive has not been a major factor in their level of spending on R&D. Where appropriate they are utilising the benefit of the 150% tax deduction but their level of expenditure would have been substantially the same without any government initiative in this area. Even though the level of R&D in the companies surveyed is quite high it still does not compare with the level of spending in the parent companies of the Japanese companies that were surveyed. Their average expenditure is 14.5% of yearly sales. When asked by what process R&D is carried out by the company the following responses were received.

TABLE 3 METHOD OF RESEARCH AND DEVELOPMENT

METHOD	RESPONSES
By salaried staff	100%
By subcontract staff - inside the company	33%
By subcontract staff - outside the company	55%
At a university	44%
In conjunction with another company	22%
At the C. S. I. R. O. <sup>5)</sup>	44%

There were multiple answers to this question which caused the high responses. Twenty five percent of the companies responding indicated that they do some of their R&D work overseas.

Seventy five percent of the responding companies indicated that they have had difficulties in attracting suitable R&D staff. The two most significant methods of staff recruitment are offering higher salaries and the availability of superannuation schemes. Fifty percent of the companies use aggressive headhunting to attract new staff and forty percent of the companies recruit overseas to get the R&D staff that they are looking for.

Out of 5 Japanese companies contacted four undertake any R&D in Australia

5) The Commonwealth Scientific and Industrial Research Organization (CSIRO) is the largest single research organization in Australia. It has a total staff of over 7000 people located in over 100 laboratories throughout Australia. About one third of the staff are Professional Scientists. It is a statutory body established by the Australian Government in 1926. Its budget in 1984 was \$A380 million.

and of these four the current level of expenditure is only 1.6% of annual sales. Two of these four companies indicated that their level of R&D would increase within the next 3 years to figures of 3 and 5 percent of annual sales. Of the 16 companies that responded to the survey it was interesting to note that only 2 companies answered the question "What is the percentage return on your companies R&D investment." These two responses were 35% and 350%. It appears that most companies understand the benefits of R&D in developing new products but few companies understand the mechanism by which such spending can be translated into increased sales figures for the company. This is an important area of R&D activity that needs further research.

### 3 MANUFACTURING

All companies surveyed<sup>6)</sup> were involved in manufacturing within Australia and this survey was designed in part to determine the extent of manufacturing and to ascertain the degree of involvement of R&D in the local manufacturing environment.

The companies that responded to the survey were manufacturing products that fell into the following categories. (Table 4)

**TABLE 4 MANUFACTURING INDUSTRIES**

PRODUCT CATEGORY	NATIONALITY	AUSTRALIAN	JAPANESE
Communications Products		****	*
Health Care Products		***	
Audio and Hi-Fi Products		*	**
Consumer Appliances			
Electronic Components		*	
Chemical Analysis Instruments		*	
Electronic Instrumentents		****	
Computer Equipment		*****	
Whitegoods			
Scientific Instruments		***	
Optical Instruments		**	
Laser Equipment		*	
Industrial Electronics		****	
Colour Television Sets			****

Number of asterisk indicates that of companies.

6) Of the Australian companies surveyed 12 useable responses were received out of 50 companies. Of the Japanese companies surveyed 5 useable responses were received out of 14 companies. Three of these 14 companies which had been identified as manufacturing companies had ceased trading in Australia within the last three years. One of the television manufacturing companies with only 60% Japanese interest did not respond to the survey officially but provided interesting background data.

As can be seen from Table 4 the Japanese companies are only involved in limited industry categories compared to the Australian companies, however within these categories they hold commanding grips on the market.

The colour television market in Australia has changed considerably since facture started in this country in 1956. In 1956, the first year of television usage in Australia there were 25 local manufacturers according to Industries Assistance Commission [9], this had reduced to 6 plus one Japanese company (Matsushita) by 1972. By 1986 the ownership of colour television manufacturing plants had undergone a considerable change. Five of the six companies are now owned by Japanese interests. These are NEC, Sharp, Sanyo, Matsushita and Mitsubishi. The sixth company is Philips Industries Holdings Ltd. (Owned by N.V. Philips, Holland.)

Apart from Philips the Australian market is totally controlled by the Japanese companies and total colour television sales in Australia is currently about 600,000 sets per year. Of this figure about 300,000 are fully imported sets with a screen size of less than 47cm and the balance are locally manufactured. The total size of the market is about \$A400 million.

As all the Japanese companies surveyed except one are solely involved in colour television manufacture and none of the Australian companies manufacture colour television sets, it is interesting to compare the differing technologies used by Australian and Japanese companies in the manufacturing process. The following table examines the methods of manufacture currently used in manufacturing operations of the companies surveyed.

**TABLE 5 COMPARATIVE PRODUCTION METHODS**

PRODUCTION METHOD	NATIONALITY	AUSTRALIAN	JAPANESE
Wave Soldering		*****	***
CAD-CAM Design		*****	*
Surface Mount Technology		***	*
Assembly Robots		*	*
Hand Soldering of PCB's		*****	*
Automated Circuit Testing		****	***
Computerised Stock Control		*****	**
Multilayer PCB's		*****	*
Machine insertion of Components		*	***
Hybrid Electronics		**	*
Thick Film Technology			*

Number of asterisk indicates that of companies.

The techniques of Machine Insertion of Components, Automated Circuit Board Testing and Wave Soldering are the staple production methods of high volume, low cost mass production. It is this type of production method that enables the modern colour television set to be produced by relatively unskilled production workers. Methods shown above that have only one star in the Japanese section are used by the only Japanese company not manufacturing colour television sets.

It can be seen that the more advanced production techniques such as CAD-CAM design, Surface Mount Technology and Hybrid Electronics are not used in the manufacture of colour televisions.

In examining the manufacturing industry in Australia it is important to look at the origin of the components used in the manufacturing activity. In previous years a large number of components were manufactured in Australia and in 1971 over 7000 people were employed in the electronic component industry. This industry would currently employ less than 1500 people. Industries Assistance Commission [9].

This large scale reduction in the work force was largely caused by the then Government's across the board 25% tariff cuts in July 1973. The reduction in tariffs was designed to restructure the industry and make it more competitive. The theory at the time was that with the forthcoming introduction of colour television the demand for components would increase and provide support for the local components industry. This did not occur and the net effects of the tariff cuts and the changing technological requirements of the industry caused a large scale reduction in the components industry. The acquisition of 5 of the 6 colour television manufacturing companies by Japanese interests has meant that the expected growth in the local components industry was not forthcoming as these companies could source their components from their parent companies. Unlike the automobile industry there is no significant local content requirement for the electronics industry in Australia.

In 1973 the proportions of local vs imported components used in the manufacture of colour television sets was 50 : 50. By 1983 these ratios had changed to 17:83 and the local content is still falling. The main local content component is the cabinet.

It is also interesting to compare the overall cost structure for the average Australian company compared to the colour television industry standard costs.

TABLE 6 INDUSTRY COST STRUCTURE

COSTS	AUSTRALIAN	JAPANESE (1)	JAPANESE (2)
Raw Materials	52%	60%	67%
Direct Labour	22%	17%	23%
Overheads	26%	23%	10%

The figures for the Japanese manufacturers (1) are taken from Industries Assistance Commission [9] and are for the colour television manufacturing industry. The second set of figures for the Japanese manufactures is for the survey results.

It is apparent that the rise in the value of the Yen has had a considerable effect on the value of raw materials (over 80% of components are imported) and that in order to remain competitive in the industry the overhead expenses have been severely cut.

## CONCLUSION

The electronics manufacturing industry in Australia has undergone significant changes like follows.

1. The restructuring of the electronics industry has meant a large reduction in the workforce over the last 15 years.
2. The television manufacturing industry has totally changed ownership with 5 of the 6 manufacturers now Japanese companies.
3. New companies have grown with the rise of the microelectronics industry and these new companies are export oriented and export a considerable portion of their production.

Japanese cumulative direct investment in Australia from 1951 to 1986 stands at 4.3% of worldwide investment and Australia ranks as the fifth major recipient. Although figures for Japanese total direct investment abroad reveal a strong shift into non-manufacturing sectors (78.1%), the share of electric and electronic appliances remain almost at the same level (4.2% in 1985/86). Australia-Japan Economic Institute [3]



Further direct investment from Japan in Australia is expected in an industry of electronic and electric parts such as condenser, print board, switch and semi conductor, as well as automotive parts, plastic formation, paint, metal pressing fabrication and pharmaceutical industries. JETRO [10]

#### REFERENCES

- [ 1 ] Arthur D. Little International Inc., *The Electronic Components Industry*, Australian Government Publishing Service, Canberra, 1974.
- [ 2 ] Australia-Japan Economic Institute, *Japanese Business Activity in Australia-1983 : A Survey of Japanese Investment*, December 1983.
- [ 3 ] Australia-Japan Economic Institute, *Newsletter*, Vol.7, No.3, July 1986.
- [ 4 ] Australian Bureau of Statistics, *Year Book of Australia*, Australian Government Publishing Service, Canberra, 1986.
- [ 5 ] Australian Science and Technological Council, *Microelectronics*, Australian Government Publishing Service, Canberra, 1981.
- [ 6 ] Edgington, David W., "Some Aspects of Japanese Manufacturing Investment in Australia", *The Otemon Bulletin For Australian Studies*, Vol.10, December 1984, pp.109-127.
- [ 7 ] Hoshino, Yasuo and Terrence J. Byfield, "Characteristics of Japanese Corporations with Manufacturing Facilities in Australia". To be published in *The Otemon Bulletin For Australian Studies*.
- [ 8 ] Ichimura, Shinichi, "Japanese Management in South East Asia, Introduction", *South East Asian Studies*, Vol.22, No.4, March 1985, pp.3-26.
- [ 9 ] Industries Assistance Commission, *Certain Consumer Electronic Equipment and Components*, Report No. 339, Australian Government Publishing Service, Canberra, 1984.
- [10] JETRO (Japan External Trade Organization) and Overseas Economic Information Center, *Nichi-Go kan no Chokusetsu Toshi no Genjyo to Nichi-Go Sangyo Kyoryoku no Kanousei* (Present Situation of Direct Investment between Australia and Japan and the Possibility of Australia-Japan Industrial Cooperation), March 1986.
- [11] Ozawa, Terutomo, *Multinationalism Japan Style : The Political Economy of Outward Dependency*, Princeton University Press, 1979.
- [12] Page-Hanify, G., *A Growth Strategy for Australia's Communications Equipment Industry*, Australian Electronic Industry Association, March 1986.
- [13] Sato, Kazuo and Yasuo Hoshino, *The Anatomy of Japanese Business*, M.E. Sharpe Inc., Armonk, N.Y., 1984.
- [14] The Electronics Industry Advisory Council, *The Australian Electronics Industry*, Australian Government Publishing Service, Canberra, 1980.
- [15] Varvel, David, *A Survey of Japanese Management and Business Activity in Australian Subsidiaries of Japanese Manufacturing Companies*, unpublished paper, 1986.

#### APPENDIX A

#### LIST OF RESPONDING COMPANIES

COMPANY	STAFF NO.	ANNUAL SALES
Japanese subsidiaries		
Matsushita Electric Co. Aust.	141	\$A 20M
NEC Australia Pty Ltd	800	\$A210M
Sanyo Australia Pty Ltd	400	\$A 95M
Sharp Corporation of Australia Pty Ltd	370	\$A 20M
Toshiba Pty Ltd	270	\$A100M
Australian companies		
Ausonics Pty Ltd	90	\$A 25M
Awa Microelectronics Pty Ltd	55	\$A 5M
Cochlear Pty Ltd	40	\$A 4M
Fairlight Instruments Pty Ltd	90	\$A 6M
Labtam Pty Ltd	140	\$A 15M
Minitronics Pty Ltd	60	\$A 3M
Netcom Pty Ltd	45	\$A 6M
Nilsen Industries Pty Ltd	529	\$A 30M
Quentron Pty Ltd	50	\$A .6M
Sendata Pty Ltd	45	\$A 4M
Summit Electronic Systems	71	\$A 4M
Telectronics Pty Ltd	360	\$A 88M
University Grahame Pty Ltd	70	\$A 6M

APPENDIX B QUESTIONNAIRE

C O N F I D E N T I A L

THIS SURVEY WILL ONLY BE USED FOR COMPILATION OF  
STATISTICAL DATA

AUSTRALIAN ELECTRONICS MANUFACTURING INDUSTRY SURVEY

SECTION 1

COMPANY STRUCTURE.

Please indicate the size of your company in Australia.

\_\_\_\_\_ Total staff  
\_\_\_\_\_ Managerial staff  
\_\_\_\_\_ Research & Development staff

If your company is part of an overseas owned group of companies please indicate the size of the total group.

\_\_\_\_\_ Total staff  
\_\_\_\_\_ Managerial staff  
\_\_\_\_\_ Research & Development staff

What percentage of your company is Australian owned?

\_\_\_\_\_ Percent

What was the sales revenue of your company's products during the last financial year?

\$A \_\_\_\_\_

What percentage of the products manufactured in Australia are exported?

\_\_\_\_\_ Percent

Approximately what percentage of Middle and senior management are University graduates or have other equivalent tertiary qualifications?

\_\_\_\_\_ Percentage

Does your company transfer Middle management staff to various positions as a formalised job rotation policy?

\_\_\_\_\_ Yes \_\_\_\_\_ No

Does your company conduct regular in-house management training schemes for Middle management?

\_\_\_\_\_ Yes \_\_\_\_\_ No

Please answer the following statements by circling the numbers 1 to 5.

- 1 - Definitely true
- 2 - Somewhat true
- 3 - Cannot say one way or the other
- 4 - Somewhat false
- 5 - Definitely false

- Formalised job descriptions are used throughout the company. 1 2 3 4 5
- Career paths for Middle management and R&D staff are clearly defined. 1 2 3 4 5
- The company is 'Export Driven'. 1 2 3 4 5
- Individual decision making is more important than group agreement. 1 2 3 4 5
- Staff performance is regularly appraised by a formalised Management By Objective procedure. (MBO) 1 2 3 4 5
- Total Quality Control and Quality Circles operate throughout the company. 1 2 3 4 5
- Senior management have regular meetings with supervisory staff. 1 2 3 4 5
- Major corporate decisions are decided by a few Senior executives and issued as directives to the rest of the company. 1 2 3 4 5
- Staff numbers have been actively reduced in the last two years to reduce costs. 1 2 3 4 5
- The company is 'Market Driven'. 1 2 3 4 5
- Research and Development staff in your company are an integral part of the company structure. 1 2 3 4 5
- The Just In Time system of production is in use in your company. 1 2 3 4 5
- The company is 'Research Driven'. 1 2 3 4 5
- Senior management staff are often recruited from the Research and Development section. 1 2 3 4 5

**SECTION 2**

**RESEARCH AND DEVELOPMENT.**

What percentage of your company's annual sales income is spent on Research and Development in Australia?

\_\_\_\_\_ Percentage

Do you plan to change this percentage over the next three years? If so what is your target for 1989?

\_\_\_\_\_ Yes \_\_\_\_\_ No \_\_\_\_\_ Percentage

Has your company expanded its level of R&D activity as a result of the Commonwealth Government's 150% tax subsidy?

\_\_\_\_\_ Yes \_\_\_\_\_ No

If your company has expanded its R&D activity what other factors have influenced this decision? (Check applicable boxes.)

- Senior Management Directive
- Technology Transfer
- Success of Previous Products
- Economy of Australian R&D Wages compared to similar staff in Japan or the United States.
- other.

If your company is owned by an overseas parent company what percentage is spent on R&D by the parent company?

\_\_\_\_\_ Percent

By what process is R&D carried out in Australia?

- Within the company by salaried staff.
- Within the company by subcontracted staff.
- Outside the company by subcontracted staff.
- At a University under contract.
- By another company under contract.
- By a division of the CSIRO
- other.

Is any Research and Development done overseas?

\_\_\_\_\_ Yes \_\_\_\_\_ No

What is your percentage return on investment for Research and Development activities in Australia?

\_\_\_\_\_ Percent

Have you had any problems attracting suitably qualified R&D staff within Australia?

\_\_\_\_\_ Yes \_\_\_\_\_ No

Are any of the following incentives used to attract new R&D staff or offered as bonuses for existing staff?

- Above industry average salaries
- Stock ownership schemes
- Aggressive headhunting of desired staff
- Overseas recruitment
- University recruitment
- Company cars for R&D staff
- Royalty payments on patent rights
- Low interest home loans
- Overseas travel to industry related conferences
- Subsidised health scheme
- Superannuation
- Productivity bonus scheme
- other.

**SECTION 3**

**MANUFACTURING.**

How many manufacturing staff are employed by your manufacturing operation in Australia?

\_\_\_\_\_ Production staff

Which of the following techniques are in use in your manufacturing facility?

- Wave soldering
- CAD-CAM design and layout
- Surface mount technology
- Assembly robots
- Hand soldering of PCB's
- Automated circuit board testing
- Computerised stock control
- Use of multilayer PCB's
- Machine insertion of components
- Hybrid electronics
- Thick film technology

Do you manufacture any products to comply with a regulated standard?  
e.g. MIL SPEC, GMP, UL standards, etc.

\_\_\_\_\_ Yes      \_\_\_\_\_ No

If so, what proportion of your annual production is made to these standards?

\_\_\_\_\_ Percent

Please indicate if you manufacture any products in Australia in the following categories.

- Communications
- Health care products
- Audio and HiFi products
- Consumer appliances
- Electronic components
- Chemical analysis instrumentation
- Electronic instrumentation
- Computer equipment
- Whitegoods
- Scientific instrumentation
- Optical instrumentation
- Laser equipment
- Industrial electronics
- other

What proportion of the components used for manufacture in Australia are themselves manufactured in Australia?

\_\_\_\_\_ Percentage by number

\_\_\_\_\_ Percentage by value

Can you give an approximate estimate of the current value of your manufacturing equipment?  
(replacement value of equipment only, do not include building or land costs)

\$A \_\_\_\_\_

What is the percentage cost of the following in your manufacturing facility in Australia.

Cost of raw materials \_\_\_\_\_ %

Labour \_\_\_\_\_ %

Overheads \_\_\_\_\_ %

Thank you for your cooperation. We would like to stress that the results of this survey will only be compiled as statistical data and when the results are published your company will not be identified in association with any individual response.