

The New Zealand electronics industry

A stocktaking

F. L. FULLER (General Manager of E.D.A.C.)

The fourth Slade Memorial Lecture presented by the New Zealand Electronics Institute evaluates the New Zealand electronics industry, indicates its potential and highlights some of its problems.

INTRODUCTION

Many years ago Ralph Slade foresaw the penetration of electronics into an ever-increasing field of human activities and, as a corollary, the development of an electronics industry of greater strength through the binding together of elements previously thought irreconcilable. Thus today, the electronic industry in New Zealand includes not only the manufacturing and servicing of consumer and professional electronic products, but the application of the art in its broadest sense, in the field of communications, industrial control, scientific analysis, data processing, health, education, research and development and this list is by no mean, exhaustive.

Subsequent references to "the electronics industry" in this lecture mean, unless otherwise stipulated, the local manufacturing and servicing industries.

Function of secondary industry in New Zealand

Historically, our secondary industries have made two major contributions to the country's welfare. They have helped:

- (1) To ensure full employment.
- (2) To conserve overseas funds.

At present, some 28% of the labour force is employed in secondary industries, which is more than twice the number employed in primary industries.

The substitution of local labour content for overseas labour content in products, which can sensibly be produced in New Zealand, is responsible for saving annually a substantial sum of overseas exchange. There are certain problems in the fostering of local industry, the most notable of which is the higher price usually associated with a locally-produced article as compared with the price at which a similar article can be imported from overseas.

It can be argued, however, that the relatively high standard of living and prosperity enjoyed by New Zealanders since the end of World War II has indicated that a balance has been preserved between costs on the one hand and full employment and exchange savings on the other.

There is a further major responsibility for secondary industry, namely, to earn income from exports.

In general, world prices for manufactured goods are not subject to the same degree of fluctuation as prices for primary products such as wool and dairy products. Thus, and as recommended by the National Development Conference, the export of an increasing volume of manufactured goods should be encouraged.

There are obviously many problems in giving effect to this policy, but three basic requirements stand out:

- (1) Careful selection of suitable industries, e.g. specialisation.
- (2) More scientific and efficient production methods.
- (3) Improved training of people technically, commercially and managerially.

The role of the electronics industry in New Zealand

As a background to the consideration of the past, present and future roles of the electronics industry in New Zealand, it is interesting to note the tremendous technological progress made in the last 40 years from the days of the early thermionic valves to today's integrated circuits. It is also interesting to observe how, over the years, mass production and improved techniques have improved quality and reduced prices.

(a) Past

The local manufacture of domestic radio receivers by a number of different companies commenced in the early 1930s. This activity progressively increased until, at the outbreak of World War II, sufficient factories and trained people existed to enable the local industry to make a valuable contribution to the war effort by, among other activities, the development and production of nearly 100,000 "ZC 1" (radio telephone) sets for use in the Pacific area. A tribute to the industry was paid by the Americans, who stated that the ZC1's were some of the most reliable communication sets they had.

Also during the war, New Zealand sent a number of her electronic engineers, and technicians to the United Kingdom for special work in the late Sir Winston Churchill's "electronic sphere".

After the war, the industry was quick to utilise surplus war assets materials to meet the market demand for domestic radio sets, introducing the new technique of transistorised sets in 1958-59.

During the 1950s, the industry also became active in the production of V.H.F. mobile R.T. sets and base stations.

Television set production commenced early in 1960. By the end of 1970, the industry had made some 700,000 television receivers which, in quality, performance and appearance are second to none anywhere in the world. In the peak year of 1964, the industry produced 160,000 receivers, On a per head basis, this production rate was some 60% higher than the peak year of production in Australia.

In the years following the television boom, the industry encountered many problems. These are clearly indicated by consideration of the industry statistics supplied by the Statistics Department, set out in Table I.

Although these figures are subject to certain qualifications, they do highlight the decline suffered by the industry after the boom years of 1964-65. The bottom of the trough appears in 1967-68.

Compared with 1964-65, by 1968-69 the ex-factory value of production had fallen by 58%, the number of persons in the industry by 38%, the number of establishments by 20%, but investment in premises and plant had declined by only 18%.

These figures also illustrate the reserve capacity in premises and plant which the industry has not been able efficiently to divert into alternative activities.

(b) Present

Currently the industry produces some 50,00 television set per year, manufacturing locally picture tubes, tuners, all wound components, loudspeakers, cabinets, metal ware and knobs, so that the average imported content per set has been reduced to about \$30.

Radio set production is running at about 125,000 sets per year. A further 30000 pieces of a wide range of audio products are also produced each year.

In addition, the industry produces some 8,000 radiotelephone sets for various types of mobile, marine and packset operation.

Although in terms of volume sales, the industrial electronics side of the industry is still in embryo, a wide range of products has already been developed and produced, ranging from diagnostic audiometers and hermetic analysers to injection-frequency controllers and real cold osmometers!

As figures from the Department of Statistics are not yet available in consolidated form later than 1968-69, one must turn to information from the Radio and Television Manufacturers' Federation, incomplete as admittedly it is, for an indication of how the industry fared in 1959-70 and 1970-71.

Table II shows that in 1968-69, some 14 companies produced electronic products to an ex-factory value of \$9.3 million, compared with the Department of Statistics figure (Table I) of 27 companies who produced goods to an ex-factory value of \$14.8 million. Thus, in 1968-69, the Federation figures represented only some 63% of the total Department of Statistics figures.

The Federation figures for 1969-70 and for the first nine months of 1970-71 show an upward trend, which one hopes is not entirely inflationary. If, as can be expected, these Federation figures bear much the same relationship to the Department of Statistics figures as they did in 1968-69, it can be expected that the latter, when available, will confirm that the industry is indeed climbing back out of the trough of 1967-68.

Another point of interest in Table II is the increasing development of professional electronic products relative to consumer products. The figures move from \$0.9 million in 1968-69 to \$1.25 million for 1969-70. This is a 40% increase compared with a 12% increase for consumer products. Further increases are again evident in the figures for the first nine months of 1970-71. There are also a number of firms making professional

electronic products but who are not members of the Federation, Thus total production of professional products can be expected to be substantially higher than indicated by the Federation figures.

The value of professional electronic products being exported is increasing and is significantly higher than the figure for consumer products.

Table III, derived from the External Trade figures of the Department is pertinent here.

In Table III, the consumer product categories are television and radio receivers, and sound-reproducing equipment. The professional categories include telecommunications equipment of all types, electrical apparatus for medical purposes and radiological apparatus, measuring, controlling and scientific instruments, and other electrical measuring and controlling instruments and apparatus.

It may also be of interest to consider the 1968-69 figures for size of establishments and productivity per person employed.

The main points in Table IV are first, that of the 1,879 persons engaged in 27 establishments in 1968-69, 1,624 or 86.5% of them were employed in 10 establishments having an ex-factory value of production of \$500,000 or over and, secondly, that the five largest units with a value of production of \$1,000,000 and over had (at \$8,697) the highest productivity per capita.

Table V is self-explanatory and shows the concentration of the industry in the Auckland and Wellington areas.

To summarise, for the year ending 30 June 1969, some 1,879 people in 27 establishments produced electronic goods in excess of \$14 million, ex-factory value, some \$300,000 of which was exported. By 30 June 1971, the export figure had increased to \$800,000, while there is also good reason, to believe that overall production was significantly higher in the 1969-70 and 1970-71 - periods.

(c) Future

Should New Zealand continue to foster and encourage the electronics industry or forget it and open our doors to cheap imports from the far east or near north?

If the latter course were adopted, it would assuredly kill any export potential, destroy what, from a defence point of view, must be regarded as a 'strategically' important industry, as well as cost New Zealand at least twice as much overseas exchange for her television sets. But if the present course is maintained, how best to increase the modest \$800,000 export figure?

In the consumer products area, the answer would appear to lie in product rationalisation with Australia Under N.A.F.T.A., while in the professional electronics sphere, concentration on "brains intensive" specialised products would appear to lead to the most promising results. As no worthwhile export activity can be mounted without a sound home market, and as the Government departments are the largest users

of professional electronic equipment, it is important that studies be conducted to ascertain what work industry best can do for these departments, as well as to consider how best the departments can co-operate with industry in the allocation of sensible development and manufacturing contracts.

It is pleasing to note that progress is being made in this direction and that the Government Stores Board has recently issued instructions to the departments under its direction to encourage industrial development by co-operation with industry in calling for prototypes and in the subsequent placing of long- term incentive orders with selected suppliers. This policy should encourage specialisation within industry and, where products are suitable, lead to exports.

A helpful and constructive atmosphere is also created by the E.A.C., N.E.D.A. and the N.Z. Electronics Institute, where people from industry, the user Government Departments, research establishments and educational institutions meet together and are able to discuss common problems and objectives.

A further boost to the export potential within the industry could probably be given by the establishment of an advisory service, similar to the agricultural extension service, whose services could be especially useful for those smaller, indigenous companies engaged in the manufacture and export of electronic products. In many cases such companies, though technically sound, are undercapitalised and lacking in competent financial management. If these smaller units could be developed into larger economic units and still retain their technical ingenuity and resourcefulness, there is no doubt that their export business would similarly grow.

The retention of present Government export incentives are of vital importance to the electronics industry.

Summary

To be an effective producer of electronic products, a country must be, in the broadest sense, a large user of electronic products.

Although the sale of television sets has long since passed its boom period, there is still reserve capacity at all levels within the industry, which cannot efficiently be diverted into alternative channels. There is, therefore, no doubt that the single most effective encouragement the industry can receive to improve its efficiency is an early announcement by the Government of a starting date for colour television in New Zealand. One can perhaps be hopeful that, after receipt by the Minister of Broadcasting of the report from the Broadcasting Authority on the pros and cons of a second television channel, some statement on future policy can be made.

This country's need to strive for diversification in depth in its primary products and to develop the export potential of its secondary industries emphasises the need for wider application of scientific methods. This means, an increasing use of electronic equipment. This, in turn, implies a need for competent consultants and well-qualified sales and systems engineers, strongly backed up by efficient service engineers and technicians. These objectives can be materially assisted by "on the spot" electronic applications

engineers and scientists, who will be readily available within the framework of a strong local industry.

An important by-product of such an industry should be, not only the export of rationalised consumer products, but the export of specialised "brains intensive" electronic products, rather than the brains themselves.

Finally, one must emphasise the point that the development of a professional or industrial electronics manufacturing activity in countries such as Australia and New Zealand needs the volume load of consumer electronic products and hence, if a strong professional activity is wanted, we must have a strong consumer activity. Thus, inadequate tariffs or other form of protection for consumer products would be equally disastrous for this country's professional manufacturing activities. Suffice it to say that members of the local electronics industry have confidence that the Government of the day will ensure that any form of tariff or other protection applied to the electronics industry will be adequate to safeguard its continuity and progress.

TABLE I—RADIO AND TELEVISION INDUSTRY

Item	1964-65	1965-66	1966-67	1967-68	% reduction 1968-69 cf	
					1968-69	1964-65
Ex factory value \$(000)	34,936	24,989	22,375	14,328	14,788	58
Persons engaged (No.)	3,039	2,750	2,538	1,884	1,879	38
Establishments (No.)	34	33	32	29	27	20
Investment—premises and plant \$(000)	5,662	6,031	5,786	5,283	4,647	18

N.B.—Years ending 30 June

Source: Department of Statistics

TABLE II—EX FACTORY VALUE \$(000) (FROM 14 COMPANIES)

	1968-69	1969-70	1970-71
Total ex-factory value	9,302	10,778	8,048
Product			(9 months)
Consumer			
Radios	3,468	4,790	4,718
Television	4,941	4,736	4,428
Professional			
Telecommunications	589	920	755
Electronics	303	332	147 (6 months only)
Total ex-factory value	9,301	10,778	8,048

Source: Radio and TV Manufacturers' Fedn.

TABLE III—EXPORT STATISTICS—ELECTRONIC INDUSTRY

	1966-67	1967-68	1968-69	1969-70	1970-71
Consumer products	\$ 17,810	37,729	75,132	43,080	26,853
Professional products	\$ 82,294	247,678	243,921	552,371	763,345
Total	\$ 100,104	285,407	319,053	595,451	790,198

Source: Derived from Department of Statistics

TABLE IV—SIZE OF ESTABLISHMENTS AND PRODUCTIVITY PER CAPITA

Size of group	1968-69			Value of production per person engaged \$
	Establishment	Persons engaged		
	No.	No.	%	
Under 30,000	5	13	0.7	5,885
30,000 - 39,999	3	16	0.8	7,010
40,000 - 99,999	5	50	2.6	5,784
100,000 - 499,999	4	176	9.4	4,906
500,000 - 999,999	5	484	25.8	7,298
1,000,000 and over	5	1,140	60.7	8,697
Totals	27	1,879	100.0	7,870

Source: Department of Statistics

TABLE V—LOCATION OF ESTABLISHMENTS—1968-69

Statistical area	Establishments	Persons engaged	Value of production
	No.	No.	\$(000)
Central Auckland	14	899	8,190
South Auckland-Bay of Plenty	5	380	2,180
Wellington	6	586	4,418
Otago	2	14	
Totals	27	1,879	14,788

Source: Department of Statistics