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The supply of and demand for
computer/communications equipment

COMMUNICATIONS

Canada



Government of Canada
Department of Communications

Gouvernement du Canada
Ministère des Communications

①
/ THE SUPPLY OF AND DEMAND FOR
COMPUTER/COMMUNICATIONS EQUIPMENT /

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Prepared in the Industry and Economic
Development Branch
Technology and Industry Sector
Department of Communications

December 1983

The information contained in
this report was compiled from
a survey conducted in 1982/83.

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1. EXECUTIVE SUMMARY

From mid-1982 to early 1983 the then-titled Economic Development Division of the federal Department of Communications conducted a mail survey on the supply of and demand for informatics equipment: computers, peripherals, data communications equipment and user-level devices. Major Canadian-based informatics suppliers and users were sent questionnaires concerning sales of and new expenditures for such equipment over the period 1980-83. Users included universities, banks, retail organizations, common carriers and similarly large purchasers.

Ninety-eight users and twenty-seven suppliers responded to the questionnaire, which represented unusually high response rates of 56 per cent and 33 per cent respectively.

The supplier respondents' data were consistent with industry data trends, which showed total estimated domestic sales increasing by 113 per cent from \$1.43 billion in 1980 to \$3.04 billion anticipated in 1983. During this period exports increased by 73 per cent, from an estimated \$550 million to approximately \$950 million. Domestic growth rates tapered off somewhat in the prevailing recessionary atmosphere: 1982 rates trailed those of 1981, and 1983 rates were expected to be lower still. Export sales, however, are considered likely to improve in 1983. In categories such as data communications, peripherals and small computers, both domestic and export sales have experienced strong growth. However, considerably reduced growth was anticipated for key-to-tape and key-to-disc entry devices, as well as RBE/RJE equipment.

Users reported that their expenditures for new equipment increased by 23 per cent between 1980 and 1983, from approximately \$120 million to an estimated \$147.4 million. The user group's annual growth rate of new expenditure has, however, been declining from a peak of 23.6 per cent between 1980 and 1981 to an expected 15.9 per cent between 1982 and 1983. Equipment stockpiling in the earlier years, done in anticipation of budget cuts, probably contributed to this decrease.

Organizations appear to be keenly aware of the difficulties associated with keeping accurate and up-to-date accounts of equipment inventories and expenditures for the more popular and inexpensive computer/communications goods. As a result, this survey excluded word processors (or machines whose primary function was word processing) due to the diversity of control centres for this equipment.

Canadian-owned supply firms have generally concentrated in a number of the higher growth but fiercely competitive areas. Although such firms currently represent a small proportion of hardware revenues, they have been gradually increasing their market share. Exports play an important role in their growth.

2. THE ECONOMIC AND MARKETING ANALYSIS DIVISION

The survey forming the basis of this report was conducted from mid-1982 to early 1983 by the Informatics Section of the Economic Development Division of the federal Department of Communications.

The Economic Development Division's responsibilities related to the promotion of user interest in computer/communications goods and services, and in the diffusion of information technology through all sectors of the Canadian economy. In 1979, the division released a publication entitled "The Principal Canadian Telecommunications Carriers: Expenditures on Telecommunications Equipment, 1973-82." In 1981 it produced a document called "The Supply of Communications Equipment in Canada." More recently it published a companion report entitled "The Supply of Computer Communications Equipment in Canada."

In September 1983, the Economic Development Division was transferred to a new Sector (Technology and Industry) established in the Department of Communications to enhance Canadian technological and economic advantages in both domestic and foreign markets. This goal is to be achieved by fostering the development and application of advanced information and communications technologies and by supporting the growth and development of industries creating, manufacturing and employing those technologies.

In the course of the attendant reorganization, the division's name was changed to Economic and Marketing Analysis and it was assigned to the Industry and Economic Development Branch.

3. THE SURVEY

STRUCTURE

The survey consisted of two parts: the supply survey, entitled "Survey of Sales of Computer Hardware" (Appendix A), and the demand survey, called "Survey of Expenditures for New Computer Hardware" (Appendix B).

Four categories of equipment were common to both the supply and demand questionnaires: computers, peripherals, data communications equipment and user-level devices. The relationship between these components is depicted on page 5. In addition, the demand questionnaires had a category for computer memory.

Three of the categories (peripherals, data communications, and user-level devices) were subdivided into specific equipment types:

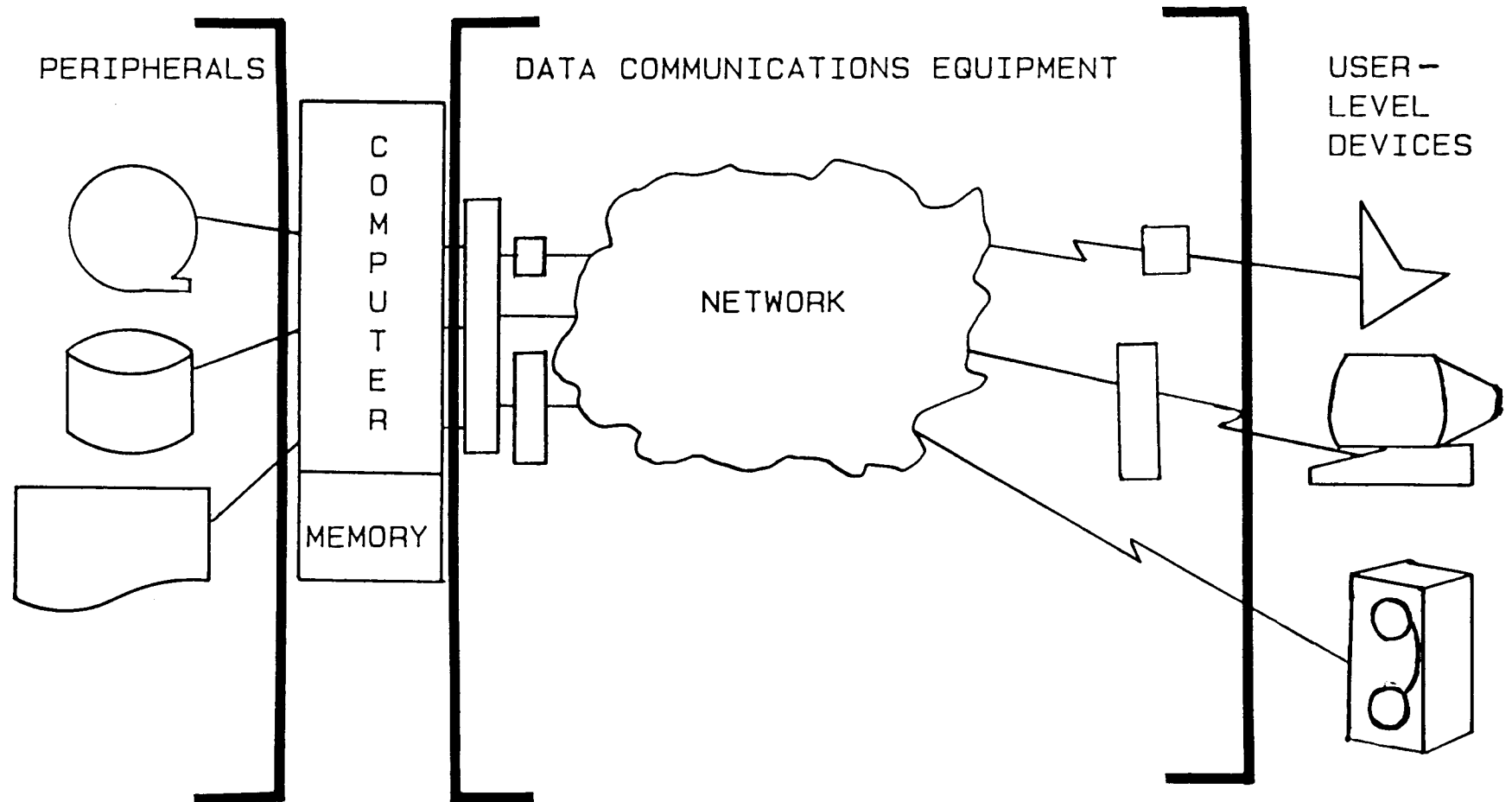
(a) Peripherals (including controllers)

This category covers equipment attached to a computer and would generally be found in a data processing environment. It includes such items as disc drives, tape drives, computer microfilm equipment, high-speed printers and optical character readers.

(b) Data Communications Equipment

This category covers equipment that is associated with the network component, generally of a computer-based system. It includes analog modems and acoustic couplers, limited distance data sets (including line drivers), front ends for telecommunications control, multiplexors and concentrators, and computer switching equipment.

INTERRELATIONSHIP OF SURVEY COMPONENTS



(c) User-level Devices

This category covers devices that often interface with the user. It includes equipment such as point-of-sale terminals, banking terminals, teleprinters, CRTs, hard-copy printers, key-to-tape and key-to-disc entry devices, graphics plotters and RBE/RJE equipment.

Information requested from equipment suppliers included domestic and export sales for the years 1980-83 inclusive. The data provided for the last two years were estimates.

Information requested from equipment users included actual or estimated purchases or leases for their 1980-83 fiscal years. They were also queried on whether data communications facilities were being used in association with their computers and were asked to identify the geographic areas served by their equipment.

METHODOLOGY

The survey was aimed at a number of the major suppliers and users of computer/communications equipment.

The major suppliers of each type of equipment, including Canadian subsidiaries or principal distributors of foreign companies, were identified by drawing on personal knowledge and industry contacts. Suppliers of more than one category of equipment were entered only once on the final supplier list. In the end, 83 firms were identified as suppliers for purposes of the survey.

Major users of computer/communications equipment were identified from industry sources and publications; they included representatives from financial and retail organizations, resource industries, universities, telecommunications carriers and government - 176 organizations in all.

Finalization of the methodology and survey material took place after consultation with government departments, private sector firms and industry associations. The cover page of the survey form outlined the important facets of the exercise: confidentiality of the provided information, use of estimates, contact information and procedures for return.

A covering letter introducing the survey and providing contacts for additional information accompanied the survey. The package was mailed to major users and suppliers in mid-1982 and a reminder notice was sent in late 1982. Replies were to be forwarded to the Department of Communications in an enclosed, stamped, self-addressed envelope.

TERMINOLOGY

The terminology that prevails in industry was used to categorize equipment. As technology in this area changes very rapidly, there is always the possibility that a new type of equipment may not exactly fit into the established categories. In such instances, the item in question was allocated to the residual category "others" under the more relevant main headings (peripherals, data communications equipment and user-level devices).

For added certainty, examples were given. In one case two types of devices (SL-10 and PACX) were used to provide examples of items covered by the computer switching equipment category. For other categories, inclusions and exclusions were identified to aid the respondent in selecting the appropriate items. This was done, for example, with "limited distance data sets," where it was indicated that line drivers were to be included, and for "CRTs Intelligent," where it was stipulated that word processors were to be excluded.

The terminology was tested on a number of private and public sector organizations to ensure that there would be minimal difficulty in the use of the survey forms.

4. THE RESULTS

SUPPLIERS

Of the 83 companies identified as major suppliers, 27 replied to the survey questionnaire, for a response rate of 33 per cent. Although this response rate is high, the small number involved severely limits the analysis that can be performed and still retain the confidentiality of data from an individual firm. Yet trends identified in the survey are consistent with expectations.

Data recently compiled by Evans Research Corporation appear in Table 1 and set the stage for the survey results. They show that the rate of growth of domestic sales, although healthy, has decreased from approximately 40 per cent in 1980-81 to 21 per cent in 1982-83. Export sales growth rates have also decreased from the high of 30 per cent in 1980-81 to 17 per cent in 1982-83, in fact, they sank to 14 per cent in 1981-82.

In 1982 the department, working with its computer communications growth model, devised estimates (see Table 2) of the Canadian computer population. The table indicates that 1980-83 growth for large and medium machines was estimated at 5 per cent, whereas for small machines a rate of 15 per cent was forecast. In the very small and desktop sizes, however, projected annual growth rates for this period were approximately 19 per cent and over 40 per cent respectively. For all size categories combined, 1982 is notable for an estimated low growth of only 9 per cent.

In their 1982 fiscal year, the 60 leading hardware suppliers in Canada had domestic and export revenues estimated at \$4.46 billion for an increase of 23 per cent over the \$3.6 billion they had realized the previous year. The 25 per cent of these firms that are Canadian-owned accounted for approximately 10 per cent of hardware revenues. Canadian firms and subsidiaries (with product mandates) of foreign multinational enterprises have

TABLE 1

CANADIAN HARDWARE SALES ESTIMATES*
(\$ MILLIONS)

	1980		1981		1982		1983	
	DOM	EXP	DOM	EXP	DOM	EXP	DOM	EXP
USER DEVICES	230	310	325	400	390	400	450	475
DATA COMM. DEVICES	55	30	100	50	140	80	180	100
PERIPHERALS	515	10	690	15	890	30	1080	35
MICRO SYSTEMS	40	5	115	10	200	25	320	35
SPECIAL PROCESSORS	35	55	40	70	50	80	60	90
PROCESSORS & ANCILL. DEVICES	530	50	700	70	810	90	900	100
MISCELLANEOUS	25	90	30	100	40	110	50	115
 TOTAL	 1430	 550	 2000	 715	 2520	 815	 3040	 950

*EVANS RESEARCH CORPORATION

TABLE 2

ESTIMATES OF COMPUTER POPULATION

DEC 31	CIPS CENSUS SIZES ¹				SMALLER SIZES ²			GRAND ³ TOTAL
	LARGE	MEDIUM	SMALL	TOTAL	V.S.	DESKTOP	TOTAL	
1980	433	3191	17605	21229	18700	41000	59700	81000
1981	455	3351	20246	24052	22300	62000	84300	108000
1982	477	3518	23283	27278	26500	87000	113500	141000
1983	501	3694	26775	30970	31500	120000	151500	182000

1. Includes only computers with monthly rental values (MRV) of \$1000/month and more. The subdivisions, by MRV, are: Large- \$50K and up; Medium- \$5K-\$49.9K; Small- \$1K-\$4.9K. These estimates are adjusted for the estimated shortfall in the coverage of the CIPS census.
2. Computers sold as such (not as components for assembly into something else) with MRV under \$1000/month. The subdivisions reflect physical size (and might become quite imprecise long before 1990). Desktops are those very small machines primarily directed to a personal use market (usually small enough to sit easily on a standard desk); V.S. (other very small) machines are somewhat larger and primarily directed to the small business firm and scientific markets.
3. Grand total estimates are rounded to the nearest thousand.

Department of Communications
 Estimate (Computer Communications
 Growth Model - 1981/1982 Update)

recognized strengths in several areas: data communications (limited-distance modems, analog modems, multiplexors and concentrators, and computer switching equipment), smaller computers (micro and turnkey systems) and peripherals (disc drives), and user-level devices (non-intelligent and intelligent CRTs). These areas, although promising, are also exceedingly competitive.

USERS

A user response rate of 56 per cent was achieved; 98 of the 176 identified major users returned the questionnaires. The respondents included banks, retail stores, universities and government departments.

The results pertaining to each equipment category are discussed below under the appropriate headings.

Computers

Users were asked to provide information on their computer installations for their fiscal years 1980 through 1983. Specifically, Question 3 (Appendix B) asked users the name of the computer manufacturer, the total number of machines procured by brand, monthly rental or total purchase price, whether data communications facilities were associated with the systems, and what geographic areas were served by the machines.

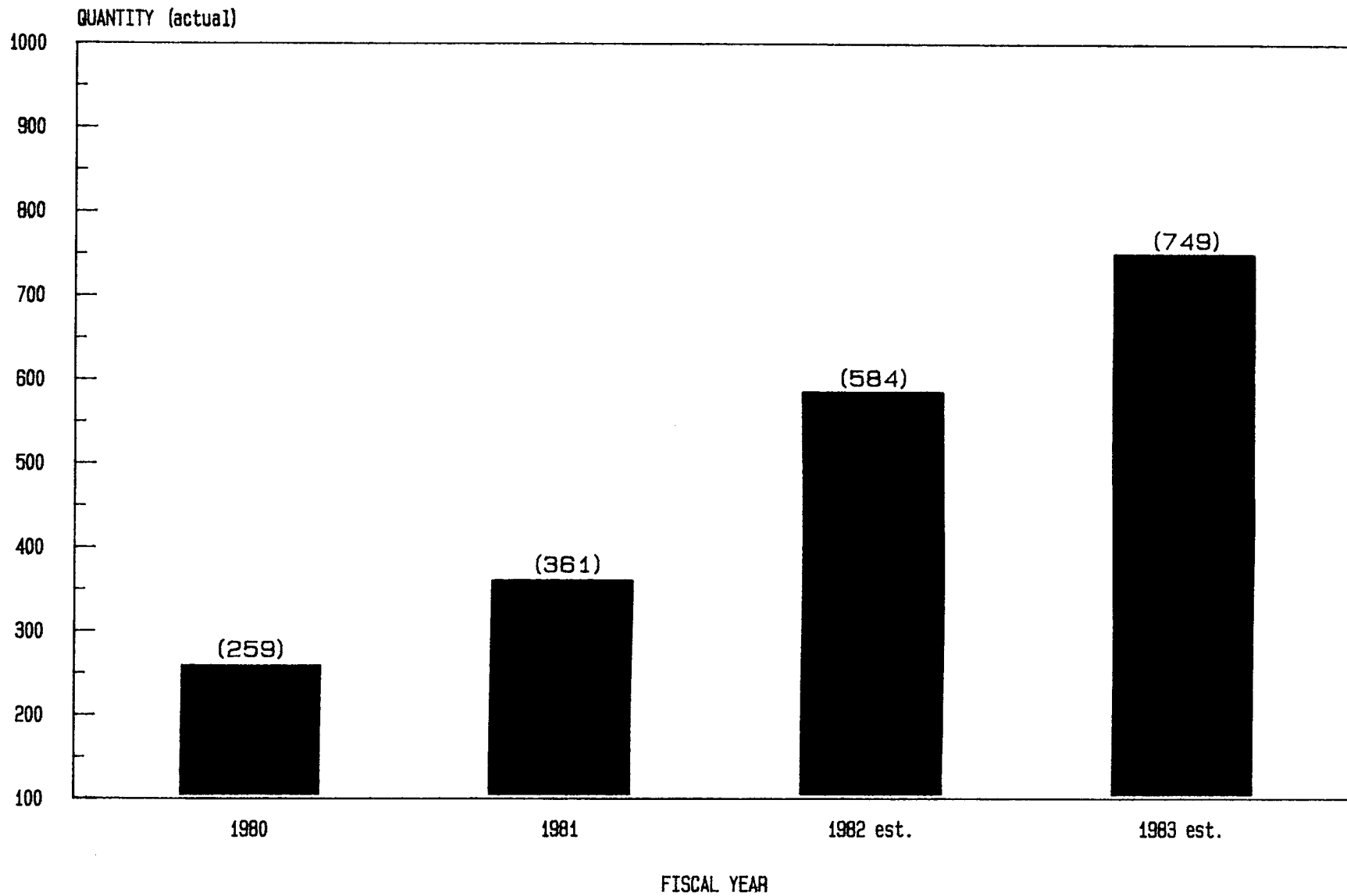
Graph 1 provides information on the number of new installations for the survey group by year. It shows that the number of computers installed rose each fiscal year, even through the 1981-82 recession.

Microcomputers accounted for a surprisingly small proportion of the increase, apparently due to under-reporting. Although small computers are known to be proliferating in many corporations, few were reported in this survey because they could often be purchased under a local budget and would not necessarily appear in the organization's central inventory.

GRAPH 1

NEW COMPUTER INSTALLATIONS (1980 TO 1983)

DOC SURVEY (98 MAJOR USERS)



The expenditures for new computer installations are shown in Graph 2; Graphs 3 through 6 illustrate this information on a source-of-supply basis. Computer expenditures peaked in 1981, partly due to replacement of or additions to the organizations' mainframes as well as stockpiling done in anticipation of data processing budget constraints. As seen in these graphs the predominant suppliers reported by users, by number of new installed units, are IBM, AMDAHL, DEC, FOUR-PHASE and HP. These firms maintain their market dominance on an annual basis. IBM retains the largest individual share of the total units installed even though that share decreases from 54.8 per cent in 1980 to an estimated 15.5 per cent in 1983. The percentage of expenditures for IBM equipment remains relatively constant, ranging from 65.1 per cent in 1980 to an expected 56.3 per cent in 1983. This is due to the number of mainframes, with obvious higher unit costs, that were procured from IBM by the surveyed group.

The installation of new memory is depicted in Graph 7. Memory additions grew from approximately 250 equivalent megabytes in 1980 to an expected 535 megabytes in 1983.

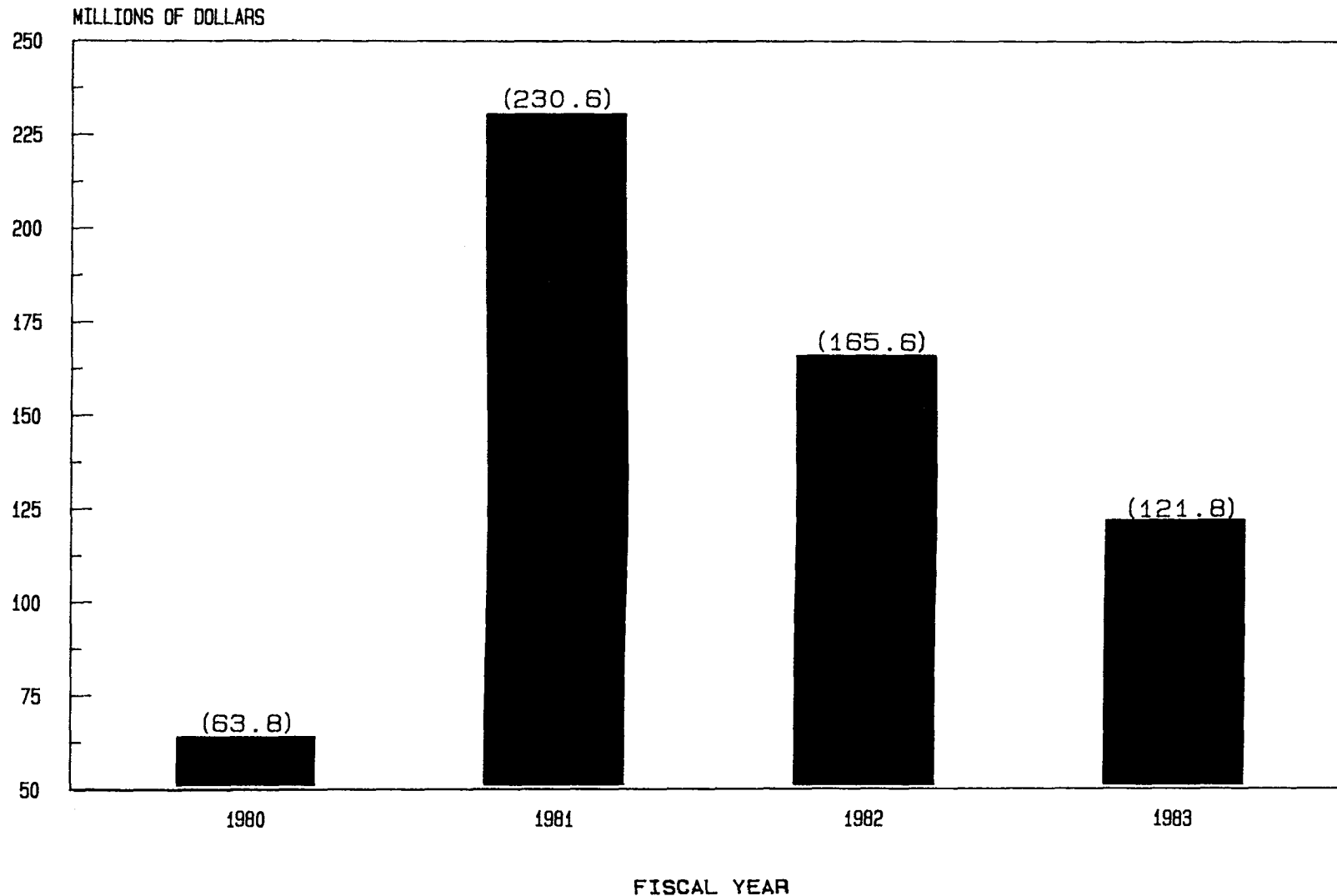
Communications continued to be a common feature of computer installations: 19.8 per cent of new units in 1980 had associated data communications facilities. This was expected to increase to 26.7 per cent in 1983.

Computer-related Equipment

This category includes three classes: peripherals, data communications equipment and user-level devices.

TOTAL EXPENDITURES ON PURCHASES AND LEASES OF COMPUTER EQUIPMENT

DOC SURVEY (98 MAJOR USERS)

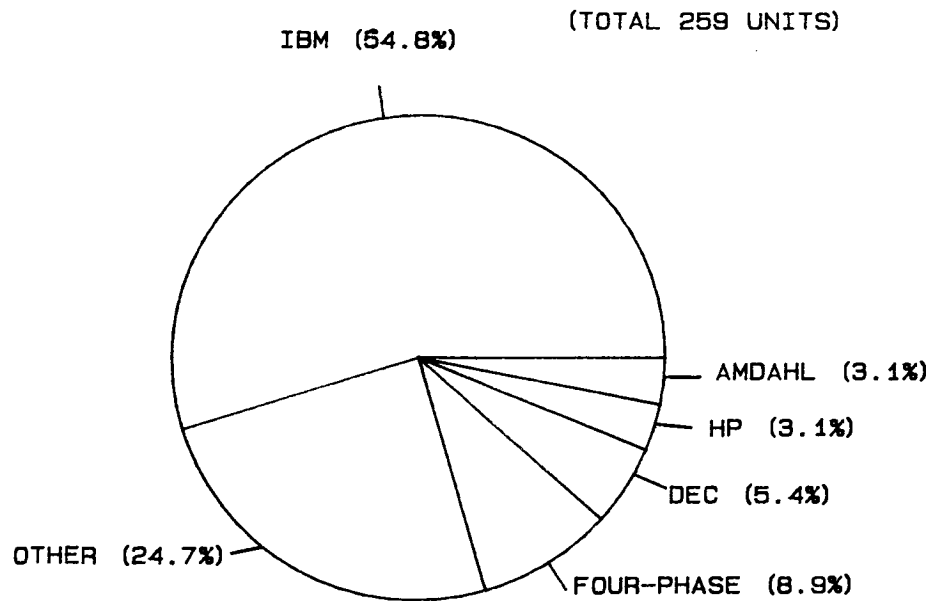


1980 USER EXPENDITURES ON COMPUTER EQUIPMENT

DOC SURVEY

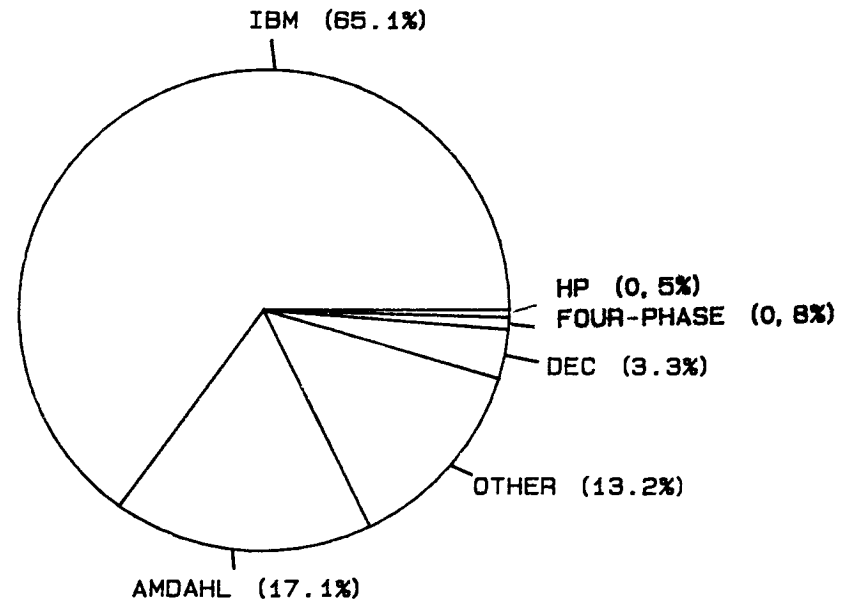
(98 MAJOR USERS)

PERCENTAGE SHARE OF TOTAL UNITS
BY SUPPLIER



SUPPLIERS' SHARE OF USERS' COMPUTER EXPENDITURES

(TOTAL \$ 63.8 MILLION)



1981 USER EXPENDITURES ON COMPUTER EQUIPMENT

DOC SURVEY

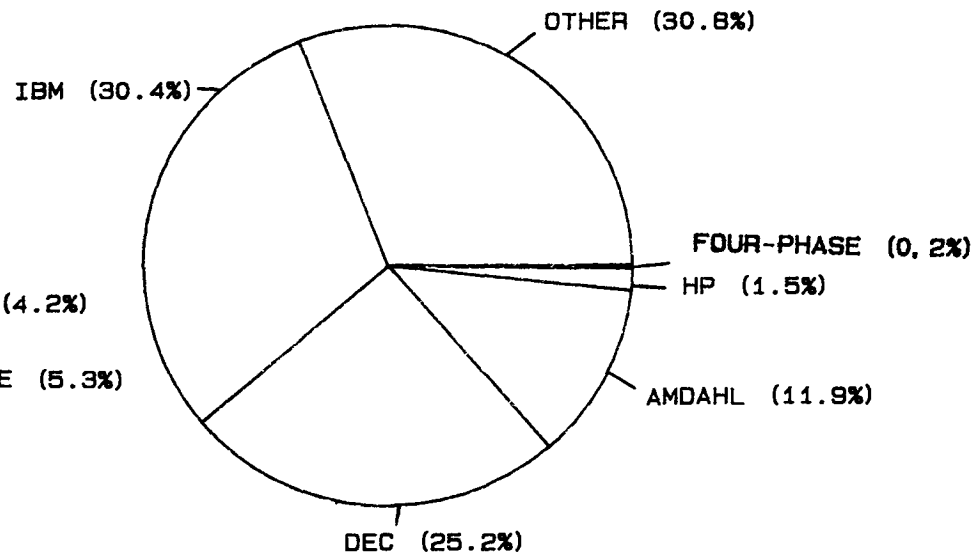
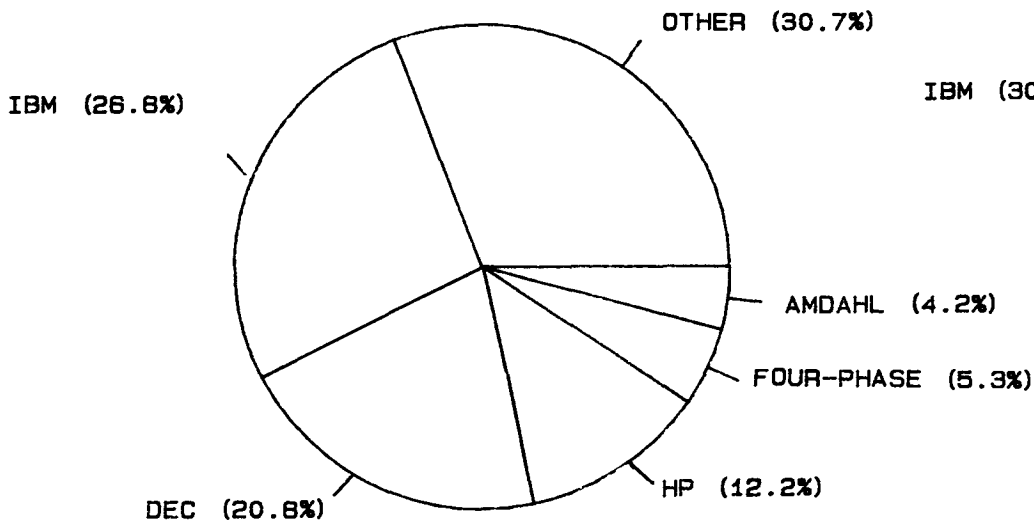
(98 MAJOR USERS)

PERCENTAGE SHARE OF TOTAL UNITS
BY SUPPLIER

SUPPLIERS' SHARE OF USERS'
COMPUTER EXPENDITURES

(TOTAL 361 UNITS)

(TOTAL \$ 230.8 MILLION)

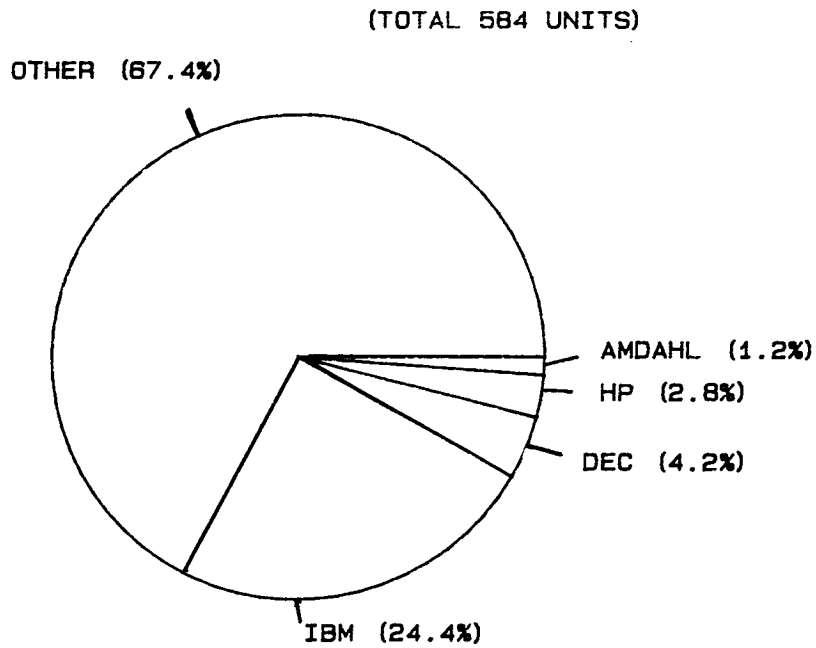


1982 USER EXPENDITURES ON COMPUTER EQUIPMENT

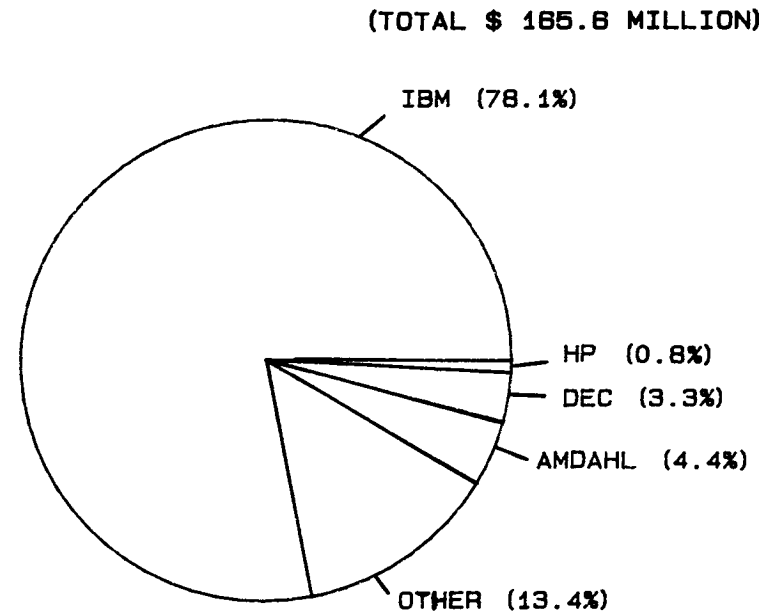
DOC SURVEY

(98 MAJOR USERS)

PERCENTAGE SHARE OF TOTAL UNITS
BY SUPPLIER



SUPPLIERS' SHARE OF USERS'
COMPUTER EXPENDITURES



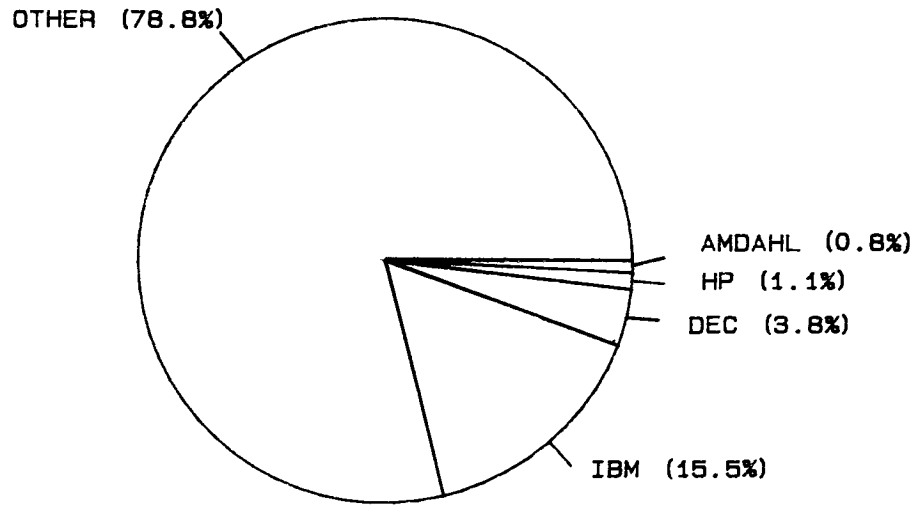
1983 USER EXPENDITURES ON COMPUTER EQUIPMENT

DOC SURVEY

(98 MAJOR USERS)

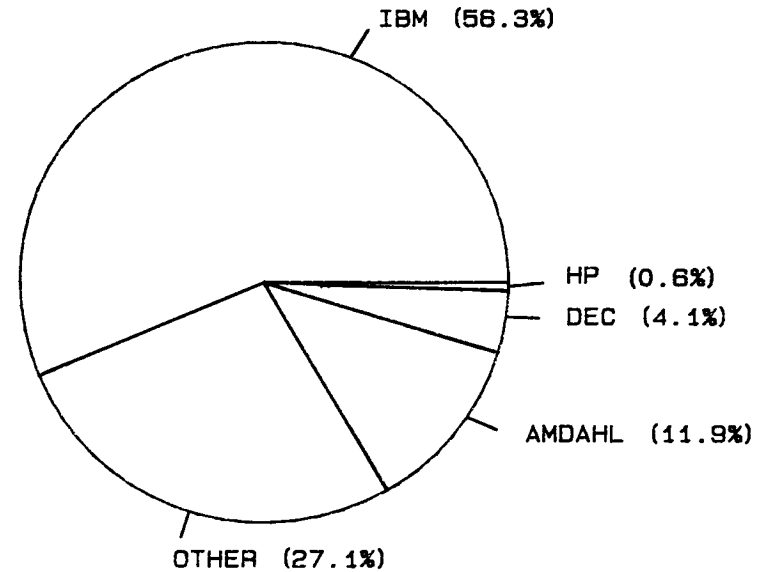
PERCENTAGE SHARE OF TOTAL UNITS BY SUPPLIER

(TOTAL 749 UNITS)



SUPPLIERS' SHARE OF USERS' COMPUTER EXPENDITURES

(TOTAL \$ 121.8 MILLION)



MEMORY AUGMENTATION

DOC SURVEY (98 MAJOR USERS)

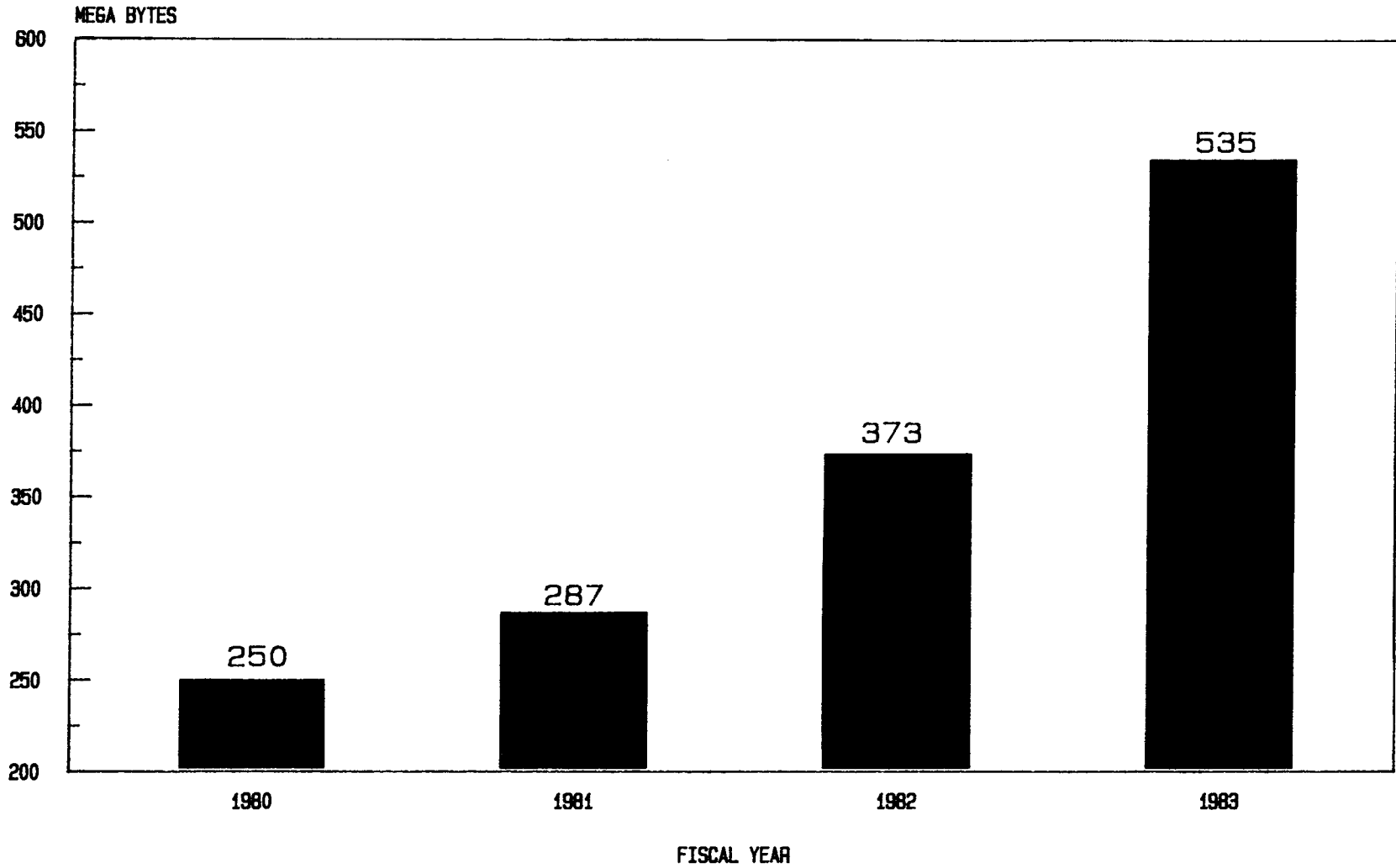


Table 3 and Graph 8 compare the number of units purchased in each of these classes during the fiscal years 1980 through 1983. Purchases of all three classes decreased in 1982 and were expected to decline even further in 1983. Table 4 and Graph 9 compare expenditures for the same classes of equipment over this period. Expenditures for peripherals and user-level devices were expected to decrease in 1983 while expenditures for data communications equipment were expected to increase.

Peripherals (including controllers)

The relative importance of the various categories of peripheral equipment purchased each year is fairly constant. In terms of number of units, the ranking is as follows: discs, tapes, high-speed printers, optical character readers and computer microfilm equipment. In terms of user expenditures, the relative importance of the same categories is again stable although somewhat different: discs, high-speed printers, tapes, computer microfilm equipment and optical character readers. Table 5 portrays this information and shows that peak expenditures in this area were expected in 1982; the decline expected in 1983 would be due in part to reduced purchases of discs and computer microfilm equipment.

Data Communications Equipment

The ranking of the various categories of data communications equipment procured each year remains relatively constant in this order: analog modems and acoustic couplers, limited distance datasets, multiplexors and concentrators, front ends for telecommunications control, and computer switching equipment. User expenditures can be ranked as follows: multiplexors and concentrators, computer switching equipment, analog modems and acoustic couplers, front ends for telecommunications control, and limited distance data sets.

TABLE 3

UNITS OF COMPUTER-RELATED EQUIPMENT
ACQUIRED 1980 TO 1983

DOC SURVEY (98 MAJOR USERS)

YEAR	PERIPHERALS	DATA COMMUNICATIONS EQUIPMENT	USER-LEVEL DEVICES
1980	1190	15070	13759
1981	1565	17263	14245
1982	1536	13056	16937
1983	1035	9822	14311

GRAPH 8

UNITS OF COMPUTER-RELATED EQUIPMENT ACQUIRED 1980 TO 1983

DOC SURVEY (98 MAJOR USERS)

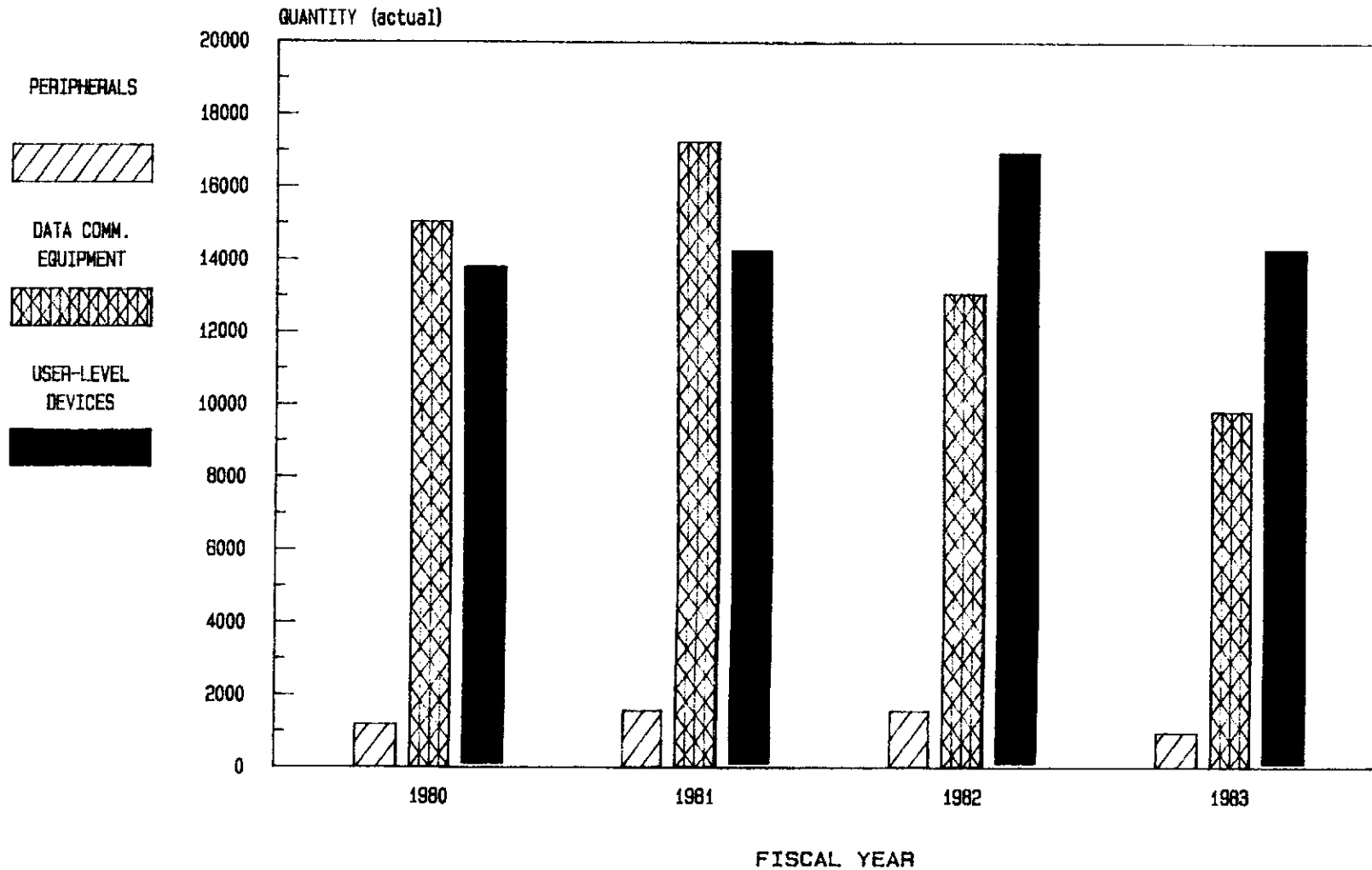


TABLE 4

EXPENDITURES ON COMPUTER-RELATED EQUIPMENT
1980 TO 1983

DOC SURVEY (98 MAJOR USERS)

(in thousands of dollars)

YEAR	PERIPHERALS	DATA COMMUNICATIONS EQUIPMENT	USER-LEVEL DEVICES
1980	34878	35008	50154
1981	45825	48779	53798
1982	46028	45670	64670
1983	37963	47204	62240

EXPENDITURES ON COMPUTER-RELATED EQUIPMENT

1980 TO 1983

DOC SURVEY (98 MAJOR USERS)

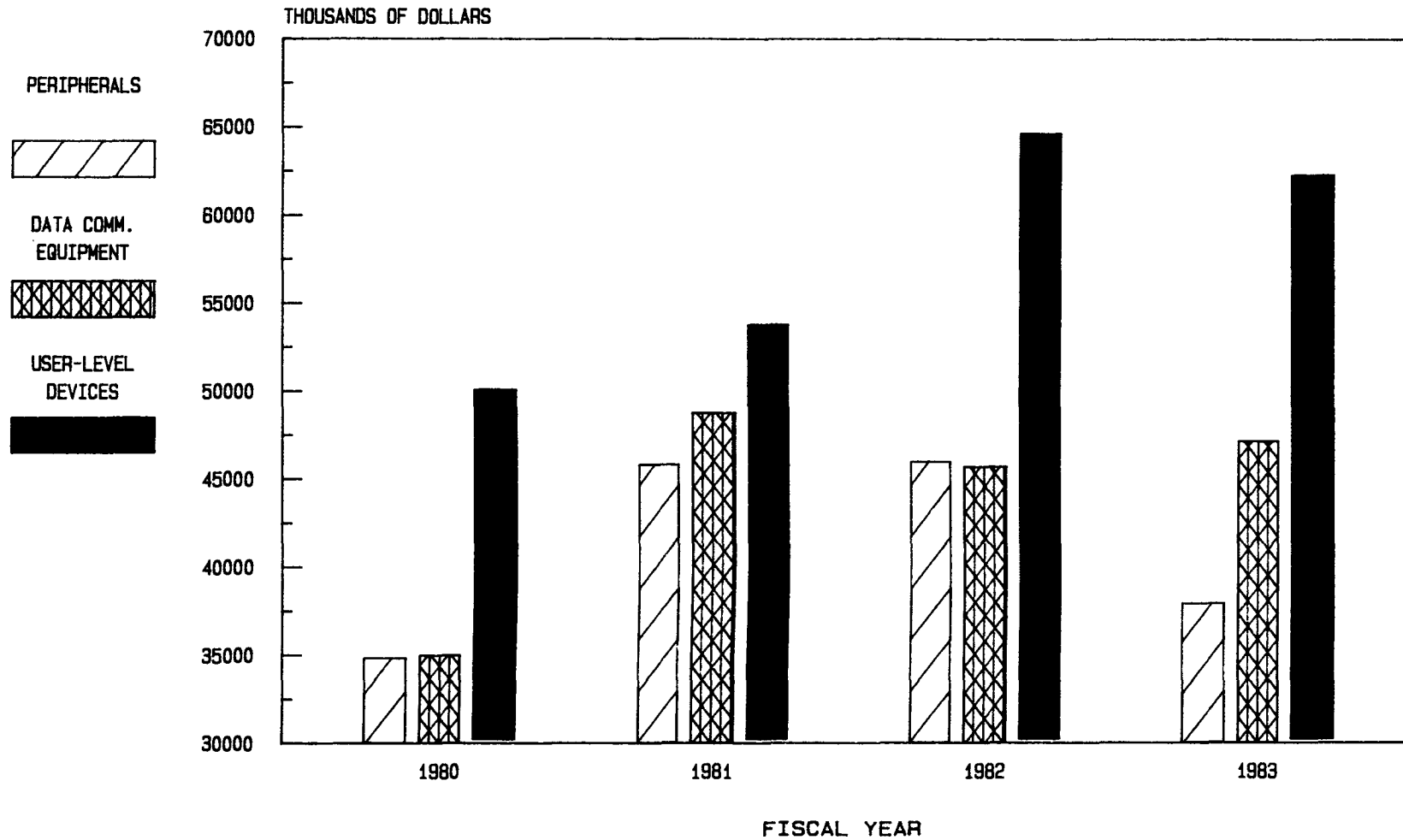


TABLE 5

PURCHASES OF PERIPHERALS
1980 TO 1983

DOC SURVEY (98 MAJOR USERS)

	1980		1981		1982		1983	
	\$000	QTY	\$000	QTY	\$000	QTY	\$000	QTY
DISK DRIVES	18493	758	28043	1078	33245	1132	27464	727
TAPE DRIVES	4527	229	8515	348	3613	252	3814	136
COMPUTER MICRO- FILM EQUIP.	1744	19	1292	9	2434	15	769	3
HIGH-SPEED PRINTERS	5568	137	4992	92	4328	97	4649	128
OPTICAL CHAR- ACTER READERS	1740	28	700	6	174	13	729	20
OTHER	2806	19	2283	32	2234	27	538	21
TOTAL	34878	1190	45825	1565	46028	1536	37963	1035

Decentralization and an increasing need to access corporate information have accelerated the growth of data communications. To increase efficiency of communications within their organizations, users employ multiplexors and concentrators to reduce line costs, and computer switching equipment to allow access versatility and reduce port congestion. Table 6 provides an annual breakdown of surveyed user demand for data communications equipment.

User-level Devices

Examination of the number of user-level devices procured by the respondents indicates some variance over the last four fiscal years. However, the category ranking can be summarized as follows: non-intelligent CRTs, intelligent CRTs, hard-copy printers, teleprinters, banking terminals (internal bank operations), point-of-sale terminals, banking terminals (customer interface), graphics plotters, RBE/RJE equipment, key-to-disc entry devices, and key-to-tape. Decreasing equipment costs and the need to access information resources or improve customer-related transactions have stimulated terminal purchases considerably.

As indicated in Table 7, user expenditures for this class of equipment have varied considerably for the years 1980-83. CRTs, financial terminals and printers have generally represented the greatest outlays. These classes of devices often lead to increased productivity and can be added to existing systems without too much difficulty.

TABLE 6

PURCHASES OF DATA COMMUNICATIONS EQUIPMENT
1980 TO 1983

DOC SURVEY (98 MAJOR USERS)

	1980		1981		1982		1983	
	\$000	QTY	\$000	QTY	\$000	QTY	\$000	QTY
Modems	17255	13101	23310	14671	13572	10891	10316	8256
Limited Distance								
Data Sets	552	860	734	1200	1101	1210	762	966
Front Ends	3212	44	4511	116	3609	70	4958	55
Multiplexors	9199	910	9856	114	11670	583	12094	144
Computer Switch-								
ing Equip.	4752	34	7652	727	9666	63	11459	46
Other	38	121	2716	435	6052	239	7615	355
 TOTAL	 35008	 15070	 48779	 17263	 45670	 13056	 47204	 9822

TABLE 7

PURCHASES OF USER-LEVEL EQUIPMENT
1980 TO 1983

DOC SURVEY (98 MAJOR USERS)

	1980		1981		1982		1983	
	\$000	QTY	\$000	QTY	\$000	QTY	\$000	QTY
POINT-OF-SALE								
TERMINALS	5841	1363	6924	1650	8078	1569	3888	1001
BANK TERMINALS								
-INTERNAL	1380	1188	5954	1858	13466	2413	7180	1293
-CUSTOMER	12254	758	8862	519	8357	481	14228	637
TELEPRINTERS	2114	1218	2526	1387	3061	1615	3682	1638
CRTS								
-INTELLIGENT	10938	3048	7432	2125	6057	2294	8426	2191
-NON-INTELLIGENT	8789	4410	12098	4964	14529	6347	12380	5502
PRINTERS	5476	1573	4779	1416	6855	1796	6992	1703
KEY-TO-TAPE	163	67	0	0	2	3	9	1
KEY-TO-DISK	517	63	1210	102	868	88	168	14
GRAPHIC PLOTTERS	177	12	504	29	577	51	943	50
RBE/RJE EQUIP.	1480	54	1364	51	1251	53	1313	36
OTHER	1025	5	2145	144	1569	227	3031	245
 TOTAL	 50154	 13759	 53798	 14245	 64670	 16937	 62240	 14311

5. CONCLUSIONS

The following conclusions can be drawn from the survey and from discussions with a number of its respondents:

- (1) The ubiquity of word processors and very small computers (desktop, personal, etc.) has dramatically altered the world of informatics. The survey, excluded word processors (or machines whose primary function was word processing), however, due to the diversity of control centres for this equipment within organizations. Organizations appear to be keenly aware of the difficulties associated with keeping accurate and up-to-date accounts of equipment inventories and expenditures for the more popular and inexpensive computer/communications goods.
- (2) Anticipated 1983 expenditures reflect decreases in peripherals and user-level devices and an increase in data communications equipment. Equipment stockpiling and adherence to multiphase expansion plans appear to have taken place in the surveyed organizations in fiscal 1981 and 1982 in anticipation of reduced budgets.
- (3) The greatest increase in demand is expected to encompass CRTs, teleprinters, multiplexors and concentrators; whereas considerably reduced growth was anticipated for key-to-tape and key-to-disc entry devices, as well as RBE/RJE equipment.
- (4) The share of expenditures on IBM computer equipment has been high (from 65.1 per cent in 1980 to 56.3 per cent in 1983) although there has been a decrease in the number of IBM computers installed. For the surveyed companies IBM and plug compatible mainframes were clearly the standard.

- (5) The revenue share of the leading Canadian-owned companies in the hardware sector remained relatively constant in the vicinity of 10 per cent (9.8 per cent in 1979 and 10.0 per cent in 1982).
- (6) Canadians' strengths are found in the high growth, competitive areas: i.e., data communications (modems, multiplexors, computer switching equipment), specialized small business computers and some user-level devices (specialized CRTs).
- (7) Export sales are accounting for an increased portion of Canadian-based companies' revenues. This is particularly evident in data communications, peripherals and micro-based computer systems.

APPENDIX A

SURVEY FORM

"SURVEY OF SALES OF COMPUTER HARDWARE"



SURVEY OF SALES OF COMPUTER HARDWARE

1980-1983

ENQUÊTE SUR LES VENTES DE MATÉRIEL INFORMATIQUE

- The purpose of this survey is to obtain past, present and prospective data on the sale of computer hardware. The survey is undertaken pursuant to provisions of the **Department of Communications Act**. Response to this survey is voluntary.
- The Department will keep CONFIDENTIAL (as defined in the **Official Secrets Act** which is binding on the Department) all individual respondent information. Such data will not be released to other government departments and only aggregate information, from which no individual respondent's information can be identified, will be published.
- Where actuals are not available, **PLEASE PROVIDE ESTIMATES**.
- Dollar values requested in this questionnaire should be recorded to the nearest thousand and should be based on fiscal year actuals or projections.
- Upon receipt of your completed questionnaire, you will receive a complimentary copy of the results of this survey. This publication will be forwarded to you when tabulations are completed.
- Should you require further information to assist you in completing this questionnaire, please contact the

Economic Development Division
Communications Economics Branch
Canada Department of Communications
Ottawa, Ontario K1A 0C8
(613) 995-8181

- Please return one copy of your completed questionnaire in the enclosed pre-addressed and postage-paid envelope to the address shown above.

- La présente enquête vise à fournir des données sur les ventes antérieures, actuelles et futures de matériel informatique. Elle est menée conformément aux dispositions de la **Loi sur le ministère des Communications**. La réponse à cette enquête est facultative.
- Le Ministère gardera CONFIDENTIEL (conformément à la **Loi sur les secrets officiels** à laquelle le Ministère est lié) chacun des renseignements qu'il obtiendra. Ces données ne seront pas divulguées à d'autres ministères fédéraux, et seul l'ensemble de l'information, auquel aucun répondant en particulier ne pourra être associé, sera publié.
- Lorsqu'il est impossible de fournir les données réelles, **VEUILLEZ DONNER UNE ESTIMATION**.
- Les sommes d'argent à indiquer dans le présent questionnaire doivent être arrondies au millier le plus près et basées sur les données réelles ou prévues de l'année financière.
- Lorsque nous aurons reçu votre questionnaire dûment rempli et disposé en tableaux les données obtenues, nous publierons un rapport des résultats de l'enquête dont vous recevrez un exemplaire à titre gracieux.
- Pour de plus amples renseignements sur la façon de remplir le questionnaire, veuillez communiquer avec la

division du Développement économique
direction de l'Économique des communications
ministère des Communications
Ottawa (Ontario) K1A 0C8
(613) 995-8181

- Veuillez retourner une copie de votre questionnaire dûment rempli dans l'enveloppe de retour pré-affranchie ci-jointe.

• **KEEP ONE COMPLETED COPY OF THIS QUESTIONNAIRE FOR YOUR FILE.**

• **GARDEZ UNE COPIE DE VOS RÉPONSES AU QUESTIONNAIRE POUR VOS DOSSIERS.**

1. In what month did your latest completed fiscal year end?
 À quel mois votre dernier exercice financier s'est-il terminé? ▶
2. For the items listed below, please provide the dollar values of actual and projected Domestic and Export Sales for fiscal years 1980 through 1983. DOLLAR VALUES TO BE REPORTED SHOULD BE IN THOUSANDS.
 En regard de chaque article de la liste ci-dessous, veuillez indiquer en dollars les montants réels et prévus des ventes intérieures et des exportations à partir de l'exercice 1980 jusqu'à l'exercice 1983. CES MONTANTS DOIVENT ÊTRE INDICUÉS EN MILLIERS DE DOLLARS.

COMPUTERS (EXCLUDING PERIPHERALS)
 ORDINATEURS (À L'EXCEPTION DES PÉRIPHÉRALES)

PERIPHERALS (INCLUDING CONTROLLERS)/PÉRIPHÉRIQUES (Y COMPRIS LES ORGANES DE COMMANDE)
Disk Drives (excluding floppy drives) Unités de disques (à l'exception des unités de disques souples)
Tape Drives (7T or 9T) Systèmes d'entraînement de bande magnétique (7T ou 9T)
Computer Microfilm Equipment Matériel de microfilm informatique
High Speed Printers Imprimantes rapides
Optical Character Readers Lecteurs optiques de caractères
Other: Please Specify Autres: veuillez préciser
SUB-TOTAL: PERIPHERALS SOUS-TOTAL: PÉRIPHÉRIQUES

DATA COMMUNICATIONS EQUIPMENT/MATÉRIEL DE TRANSMISSION DE DONNÉES
Analog Modems and Acoustic Couplers Modems analogiques et coupleurs acoustiques
Limited Distance Data Sets (including Line Drivers) Ensembles de transmission de données à distance limitée (y compris les commandes de lignes)
Front Ends for Telecommunications Control Ordinateur de contrôle des télécommunications
Multiplexors and Concentrators Multiplexeurs et concentrateurs
Computer Switching Equipment (e.g. SL-10, PACX, etc.) Matériel de communication informatique (SL-10, PACX, par exemple)
Other: Please Specify Autres: veuillez préciser
SUB-TOTAL: DATA COMMUNICATION EQUIPMENT SOUS-TOTAL: MATÉRIEL DE TRANSMISSION DES DONNÉES

USER-LEVEL DEVICES/APPAREILS DESTINÉS À L'UTILISATEUR	
Point-of-Sale Terminals Terminaux d'enregistrement au point de vente	
Banking Terminals: Poste de télégestion bancaire:	Internal Bank Operations Opérations bancaires internes Customer Interface (e.g. Cash Dispensers) Liaison avec le client (distributeurs d'argent, par exemple)
Teleprinters Téléimprimeurs	
* CRTs (including controllers) TEC (y compris les organes de commande):	Intelligent (excluding Word-Processors) Intelligents (à l'exception des machines de traitement et de transmission de textes) Non-Intelligent Non-intelligents
Hard-copy Printers Imprimantes autonomes	
Key-to-Tape Entry Devices Appareils d'enregistrement direct sur bande magnétique	
Key-to-Disk Entry Devices Appareils d'enregistrement direct sur disque	
Graphics Plotters Traceurs de courbes	
RBE/RJE Equipment Matériel de télésoumission de travaux par lot et de télésoumission de travaux	
Other: Please Specify Autres: veuillez préciser	
SUB-TOTAL: USER-LEVEL DEVICES SOUS-TOTAL: APPAREILS DESTINÉS À L'UTILISATEUR	

3. PLEASE CHECK ONE OF THE FOLLOWING: In question 2 above, are domestic sales reported
 VEUILLEZ COCHER L'UNE DES CASES SUIVANTES: les réponses fournies à la question n° 2 ci-dessus indiquent le montant des ventes intérieures
- a) net of any Federal or Provincial Sales Taxes;
 après déduction de toute taxe de vente fédérale ou provinciale;
- b) contain only Federal Sales Tax;
 incluant la taxe de vente fédérale ou provinciale;
- c) contain only Provincial Sales Tax; or
 incluant la taxe de vente provinciale seulement; ou
- d) contain both Federal and Provincial Sales Taxes.
 incluant les taxes de vente fédérale et provinciale.

APPENDIX B

SURVEY FORM
"SURVEY OF EXPENDITURES OF NEW
COMPUTER HARDWARE"



SURVEY OF EXPENDITURES FOR NEW COMPUTER HARDWARE

ENQUÊTE SUR LES DÉPENSES POUR LE NOUVEAU MATÉRIEL INFORMATIQUE 1980-1983

- The purpose of this survey is to obtain past, present and prospective data on the purchase or lease of computer hardware. The survey is undertaken pursuant to provisions of the **Department of Communications Act**. Response to this survey is voluntary.
 - The Department will keep CONFIDENTIAL (as defined in the **Official Secrets Act** which is binding on the Department) all individual respondent information. Such data will not be released to other government departments and only aggregate information, from which no individual respondent's information can be identified, will be published.
 - Where actuals are not available, **PLEASE PROVIDE ESTIMATES**.
 - Dollar values requested in this questionnaire should be recorded to the nearest thousand and should be based on fiscal year actuals or projections.
 - Upon receipt of your completed questionnaire, you will receive a complimentary copy of the results of this survey. This publication will be forwarded to you when tabulations are completed.
 - Should you require further information to assist you in completing this questionnaire, please contact the
- Economic Development Division
Communications Economics Branch
Canada Department of Communications
Ottawa, Ontario K1A 0C8
(613) 995-8181
- La présente enquête vise à fournir des données sur les achats ou les locations antérieurs, actuels et futurs de matériel informatique. Elle est menée conformément aux dispositions de la **Loi sur le ministère des Communications**. La réponse à cette enquête est facultative.
 - Le Ministère gardera CONFIDENTIEL (conformément à la **Loi sur les secrets officiels** à laquelle le Ministère est lié) chacun des renseignements qu'il obtiendra. Ces données ne seront pas divulguées à d'autres ministères fédéraux, et seul l'ensemble de l'information, auquel aucun répondant en particulier ne pourra être associé, sera publié.
 - Lorsqu'il est impossible de fournir les données réelles, **VEUILLEZ DONNER UNE ESTIMATION**.
 - Les sommes d'argent à indiquer dans le présent questionnaire doivent être arrondies au millier le plus près et basées sur les données réelles ou prévues de l'année financière.
 - Lorsque nous aurons reçu votre questionnaire dûment rempli et disposé en tableaux les données obtenues, nous publierons un rapport des résultats de l'enquête dont vous recevrez un exemplaire à titre gracieux.
 - Pour de plus amples renseignements sur la façon de remplir le questionnaire, veuillez communiquer avec la
- division du Développement économique
direction de l'Économique des communications
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Ottawa (Ontario) K1A 0C8
(613) 995-8181
- Please return one copy of your completed questionnaire in the enclosed pre-addressed and postage-paid envelope to the address shown above.
 - Veuillez retourner une copie de votre questionnaire dûment rempli dans l'enveloppe de retour pré-affranchie ci-jointe.
- **KEEP ONE COMPLETED COPY OF THIS QUESTIONNAIRE FOR YOUR FILE.**
 - **GARDEZ UNE COPIE DE VOS RÉPONSES AU QUESTIONNAIRE POUR VOS DOSSIERS.**

In what month did your latest completed fiscal year end? ►
 À quel mois votre dernier exercice s'est-il terminé?

1. For the fiscal years indicated below, please indicate the physical amount of Add-on Main Memory ADDED OR TO BE ADDED to your TOTAL system. Please specify values in either thousands of Bytes (B), Words (W) or Characters (C). If you are planning to add 128K Words in Fiscal Year 1982, please enter 128K W in the table below the year 1982.

1980	1981

2. For the fiscal years indicated below, please indicate the total amount of money to be spent for Add-on Main Memory ADDED OR TO BE ADDED to your TOTAL system. Please specify dollar values to the nearest thousand.

1980	1981
\$	\$

3. For the fiscal years listed below, please indicate computers (excluding peripherals) acquired or to be acquired including additions to existing facilities and replacement of existing equipment.

Enter Name of Computer Manufacturer Nom du fabricant de l'ordinateur	Total Number of Machines Nombre total d'ordinateurs	Total Monthly Rental Location mensuelle totale (\$000)	Total Purchase Price Prix d'achat total (\$000)	* Are Data Communications Facilities associated with system(s) Les installations de transmission de données font-elles partie du(des) système(s)?		** Geographic Area(s) served by Machine(s) (By Machine Number) Zone(s) géographique(s) servies par l'ordinateur (indiquez le numéro d'ordinateur approprié)					
				YES / OUI	NO / NON	Canada	BC C.-B.	Alta Sask Man Alb. Sask. Man.	Ont. Ont.	Que. Qué.	Atlantic Atlantique
Example / Exemple IBM	3	225		2	1	1	2	2, 3	3		

Fiscal Year 1980 / Exercice 1980											

Fiscal Year 1981 / Exercice 1981											

* Addition of YES and NO tallies should equal TOTAL NUMBER OF MACHINES.
 L'addition des chiffres indiqués aux cases OUI et NON devrait donner le NOMBRE TOTAL D'ORDINATEURS.

1. Pour chaque exercice indiqué ci-dessous, veuillez inscrire le nombre de mémoires principales additionnelles AJOUTÉES OU qui DOIVENT S'AJOUTER à L'ENSEMBLE de votre système. Indiquez les valeurs en milliers de bits (B), de mots (M) ou de caractères (C). Par exemple, si vous prévoyez d'ajouter 128 000 mots au cours de l'exercice 1982, indiquez 128 000 M dans la case de l'exercice 1982 du tableau ci-dessous.

1982	1983

2. Pour chaque exercice indiqué ci-dessous, veuillez inscrire le montant d'argent total qui doit être engagé au titre des mémoires principales additionnelles qu'IL EST AJOUTÉ OU EST PRÉVU D'AJOUTER À L'ENSEMBLE de votre système. Veuillez arrondir le montant au millier de dollars le plus près.

1982	1983
\$	\$

3. Pour chaque exercice indiqué ci-dessous, veuillez inscrire le nombre d'ordinateurs (à l'exception des périphériques) que vous avez acquis ou que vous prévoyez d'acquérir, y compris le matériel d'adjonction aux installations existantes et le matériel de remplacement.

Enter Name of Computer Manufacturer Nom du fabricant de l'ordinateur	Total Number of Machines Nombre total d'ordinateurs	Total Monthly Rental Location mensuelle totale (\$000)	Total Purchase Price Prix d'achat total (\$000)	* Are Data Communications Facilities associated with system(s) Les installations de transmission de données font-elles partie du(des) système(s)?		** Geographic Area(s) served by Machine(s) (By Machine Number) Zone(s) géographique(s) servies par l'ordinateur (indiquez le numéro d'ordinateur approprié)					
				YES / OUI	NO / NON	Canada	BC C.-B.	Alta Sask Man Alb. Sask. Man	Ont. Ont.	Que. Qué.	Atlantic Atlantique
Example / Exemple IBM	3	225		2	1	1	2	2, 3	3		

Fiscal Year 1982 / Exercice 1982											

Fiscal Year 1983 / Exercice 1983											

** Machine 1 serves all Canada, machine 2 serves B.C. and Prairies, etc.
L'ordinateur n° 1 sert tout le Canada, l'ordinateur n° 2 sert la C.-B. et les Prairies, etc.

4. For items listed below which are applicable to your data processing operations, please indicate new expenditures between Fiscal Years 1980 through 1983 for equipment including additions to existing facilities and replacement of existing facilities. PLEASE EXCLUDE SPENDING FOR RENEWALS OF RENTAL OR LEASE AGREEMENTS FOR EQUIPMENT ALREADY ON-SITE.

PERIPHERALS (INCLUDING CONTROLLERS)/PÉRIPHÉRIQUES (Y COMPRIS LES ORGANES DE COMMANDE)
Disk Drives (excluding floppy drives) Unités de disques (à l'exception des unités de disques souples)
Tapes Drives (7T or 9T) Systèmes d'entraînement de bande magnétique (7T ou 9T)
Computer Microfilm Equipment Matériel de microfilm informatique
High Speed Printers Imprimantes rapides
Optical Character Readers Lecteurs optiques de caractères
Other: Please Specify Autres: veuillez préciser
SUB-TOTAL: PERIPHERALS SOUS-TOTAL: PÉRIPHÉRIQUES
For each of the fiscal years listed, what percentage of this subtotal is estimated to be attributable to new lease or rental arrangements (as opposed to purchases)? Pour chaque exercice indiqué, quel pourcentage de ce sous-total estimez-vous être attribuable à de nouveaux contrats de location avec option d'achat ou de location (par opposition aux achats)?

DATA COMMUNICATIONS EQUIPMENT/MATÉRIEL DE TRANSMISSION DE DONNÉES
Analog Modems and Acoustic Couplers Modems analogiques et coupleurs acoustiques
Limited Distance Data Sets (including Line Drivers) Ensembles de transmission de données à distance limitée (y compris les commandes de lignes)
Front Ends for Telecommunications Control Ordinateur de contrôle des télécommunications
Multiplexors and Concentrators Multiplexeurs et concentrateurs
Computer Switching Equipment (e.g. SL-10, PACX, etc.) Matériel de communication informatique (SL-10, standards automatiques privés, par exemple)
Other: Please Specify Autres: veuillez préciser
SUB-TOTAL: DATA COMMUNICATION EQUIPMENT SOUS-TOTAL: MATÉRIEL DE TRANSMISSION DES DONNÉES
For each of the fiscal years listed, what percentage of this subtotal is estimated to be attributable to new lease or rental arrangements (as opposed to purchases)? Pour chaque exercice indiqué, quel pourcentage de ce sous-total estimez-vous être attribuable à de nouveaux contrats de location avec option d'achat ou de location (par opposition aux achats)?

USER-LEVEL DEVICES/APPAREILS DESTINÉS À L'UTILISATEUR	
Point-of-Sale Terminals Terminaux d'enregistrement au point de vente	
Banking Terminals: Poste de télégestion bancaire:	Internal Bank Operations Opérations bancaires internes
	Customer Interface (e.g. Cash Dispensers) Liaison avec le client (distributeurs d'argent, par exemple)
Teleprinters Téléimprimeurs	
* CRTs (including controllers) TEC (y compris les organes de commande):	Intelligent (excluding Word-Processors) Intelligents (à l'exception des machines de traitement et de transmission de textes)
	Non-intelligent Non-intelligents
Printers Hard-Copy Imprimantes autonomes	
Key-to-Tape Entry Devices Appareils d'enregistrement direct sur bande magnétique	
Key-to-Disk Entry Devices Appareils d'enregistrement direct sur disque	
Graphics Plotters Traceurs de courbes	
RBE / RJE Equipment Matériel de télésoumission de travaux par lot et de télésoumission de travaux	
Other: Please Specify Autres: veuillez préciser	
SUB-TOTAL: USER-LEVEL DEVICES SOUS-TOTAL: APPAREILS DESTINÉS À L'UTILISATEUR	
For each of the fiscal years listed, what percentage of this subtotal is estimated to be attributable to new lease or rental arrangements (as opposed to purchases)? Pour chaque exercice indiqué, quel pourcentage de ce sous-total estimez-vous être attribuable à de nouveaux contrats de location avec option d'achat ou de location (par opposition aux achats)?	

* CRT - Cathode Ray Tube Terminal / TEC - Terminaux à écran cathodique

APPENDIX C

DATA NOTES

DATA NOTES

1. Expenditures refer to new equipment only and the value ascribed to the equipment appears only for the fiscal year in which the equipment was installed.
2. In the computer equipment category (Graphs 2 through 6) total expenditures include purchase and rental price (for those who used this method of procurement). The rental expenditure used was a one year annualized rental (i.e., monthly rental x12).
3. Table 1 (Supply Data) provided by Evans Research Corporation is on a calendar year basis.
4. This report is an interpretation of data supplied by the survey respondents. The level of accuracy of its conclusions is directly dependent upon the quality of the data received.

