CALCULATORS AND COMPUTERS

A MANUFACTURING OPPORTUNITY IN ATLANTA

Prepared for

FORWARD ATLANTA
The Atlanta Chamber of Commerce

by

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Foreword

The sixth in the series of technical reports to focus on a specific manufacturing potential found in the Metropolitan Atlanta Area, this analysis is the first to fall in the much sought after "electrical machinery" category.

Like the earlier reports in this particular series, this summary of certain of the research findings points up particular attributes offered by the Atlanta area which make Atlanta a location where the product under study can be profitably manufactured.

Additional or more detailed information desired by individual companies will be provided on a confidential basis. Questions or comments are invited.

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Summary

Because of the significant increase in the value of manufacturers'
shipments of office computing and accounting machines projected from 1960
through 1965 ($1.5 billion to $2.4 billion), additional manufacturing
facilities will be needed in these industries by 1965. Since sales competi-
tion in these industries is keen, it is logical for a firm considering the
construction of additional production facilities to locate its new unit in
an area which will provide the greatest competitive advantages to the
company.

Analysis of key location factors shows that the Metropolitan Atlanta
Area offers five advantages to an office machine plant.

1. Substantially lower production labor costs can be anticipated,
ranging from:

      a. 19.0 to 31.0% reduction in the production labor bill
      for office computing and accounting machines, and

      b. 9.7 to 18.7% reduction for companies manufacturing
      autograph registers, dictating machines, check handling
      machines and similar equipment.

2. A plentiful supply of the type of manpower required is available in
the area. The city has a particularly good supply of electronics engineers
and technicians for the manufacture of electronic computers.

3. Adequate sources of the raw materials needed in the production pro-
cess are found in and around the Atlanta area.

4. Excellent transportation facilities exist to ship the finished prod-
ucts from Atlanta to the national market.

5. A substantial market exists in the immediate area.

These assets should place a plant in the Metropolitan Atlanta Area at a
distinct competitive advantage over plants in more industrialized areas of
the United States.

INTRODUCTION

The purpose of this report is to describe in detail to existing manu-
facturers of computing and accounting machinery the opportunities for addi-
tional profits which can be gained by making those products in Atlanta.

The industry has experienced rapid expansion in the past and is expected
to expand even more rapidly in the immediate future. This expansion will, of
course, require the construction of new or larger plants. This report indi-
cates the advantages of Atlanta as a location for new plants.

A brief description of the production processes and distribution
channels follows for readers who may be unfamiliar with these facets of the
industry.

The Production Process

For purposes of describing the production processes the products may be
classified as (1) mechanical, such as manual adding machines and calculators,
(2) electro-mechanical, such as electric adding machines, calculators and
cash registers, or (3) electronic, such as electronic computers.

The production of mechanical and electro-mechanical machines basically
involves (a) the fabrication of the component parts through blanking, stamp-
ing, milling and grinding the component to its final configuration, (b)
assembly of the components into subassemblies, (c) assembly of the sub-   -
assemblies into the final machine, using specially designed assembly jigs and
fixtures, and (d) testing the finished machine. The primary difference be-
tween the mechanical and electro-mechanical processes is that the latter re-
quires the incorporation of electric motors to power the machines. Most of
the major producers have intricate conveyor systems to route components and
subassemblies between fabrication and assembly departments. The primary
purchased parts used in the production process are aluminum die castings and
plastic key covers.

The production of electronic computers, once the particular design is
finished and model tested, involves (a) the manufacture of the required
printed circuit cards, (b) the assembly of electrical components to the
circuit cards, (c) the assembly of the cards into their proper chassis, and
(d) the assembly of the finished chassis and other components into the final
machine, including the wiring of the machine itself. The first three steps
are generally performed by semi-skilled labor, while the final assembly of

the machine itself is performed by highly skilled technicians and engineers. A much higher percentage of purchased parts is used in the manufacture of the electronic equipment than is used in the production of the mechanical and electro-mechanical machines. The resistors, transistors, capacitors and other electronic components used generally are purchased parts.

Competition and Distribution

Imports of cheaper machines and the threat of increased imports have resulted in increased price competition among U. S. producers of computing equipment. This competition has resulted in some price reductions in the industry. However, there is also considerable competition among American producers in the machine servicing offered with the sale of the products.

The great bulk of the products sold by American producers is sold through their own sales offices directly to the users. The manufacturers maintain large staffs of sales and maintenance personnel to sell and service their products. The cost of training and maintaining these units is very large, especially for producers of electronic computers. The lack of established sales outlets in the U. S. is one of the major obstacles which importers have to overcome in order to compete effectively with American manufacturers.

Market Growth

National shipments from 1956 through 1960 were as follows (in thousands of dollars):[1]

	1956	1957	1958	1959	1960
Computing and Accounting Machines (SIC 3571)	$533,499	$605,896	$780,792	$829,376	$992,645
Computing and Accounting Machines, n.e.c. (SIC 3579)	138,404	137,180	114,226	136,741	139,408
Parts (sold only by complete line manufacturer)	109,871	123,286	216,986	264,999	377,331
Total	$781,774	$866,362	$1,112,004	$1,231,116	$1,509,384

Although imports of computing and accounting machines have increased substantially from 1956 through 1960, they still amount to only a small per cent of U. S. shipments. In 1960 the imports amounted to $46.8 million or 1.8% of domestic shipments, whereas exports amounted to $163.2 million or 6.2%. Imports will continue to increase in the 1960's, but are not considered a serious threat to U. S. manufacturers at the present time.

Based on the least squares trend of the above data, U. S. shipments in Industries 3571 and 3579 combined will reach $2.4 billion in 1965.[2] The greatest expansion in shipments will occur in the electronic computer and data processing field. This estimate is preferred to the much more optimistic one of Business Week, which forecasts a $4 billion market for computers and data processing equipment alone.[3]

The expansion of these industries through 1965 will require the construction of additional production facilities. The additional facilities should be located in an area which offers the most significant competitive advantages to a new plant.

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[1] See Appendix 1 for a detailed product breakdown.

[2] Least squares estimating equation: $Y = \$1,100,128,000 + \$181,997,400X$
(X Origin: 1958)

[3] Business Week, March 31, 1962, p. 62.

Location Factors

The principal factors to be considered in locating a new plant are:

1. the cost of production labor in various locations;
2. the availability of skilled manpower (including technicians and engineers);
3. distance from the raw material sources;
4. available transportation facilities (for passengers and freight);
5. the cost of plant construction; and
6. property taxes on the physical plant.

ATLANTA AS A LOCATION

Among the assets which Atlanta has to offer a manufacturer of computing equipment are lower production labor costs; an abundant supply of engineers, technicians, and unskilled labor; location near the sources of raw materials; the South's most extensive transportation facilities for both passengers and freight; an educational and research center; low construction costs; and relatively low property taxes.

Production Labor Costs

The importance of production labor costs in the computing industry can be seen from the following comparisons:

	Computing and Accounting Machines (SIC 3571)	Computing and Accounting Machines, n.e.c. (SIC 3579)
Production Wages (per cent of shipment value)	25.4	22.6
Materials, Parts, Containers, and Supplies (per cent of shipment value)	44.2	30.0

It is obvious from the above that production labor costs represent a significant portion of the value of manufacturers' shipments.

Labor costs in the Atlanta area are lower than those existing in more highly industrialized areas of the U. S., not only because of lower wage rates but because of the high productivity of the labor force in the area. According to the 1958 Census of Manufactures, average production wage rates for the computing and accounting machines industries in 1958 were as follows:

	Computing and Accounting Machines (SIC 3571)	Computing and Accounting Machines, n.e.c. (SIC 3579)
North Central States[1]	$2.97 per hour	$2.52 per hour
U. S. Average	$2.73 per hour	$2.36 per hour
New York	$2.63 per hour	$2.27 per hour
California	$2.53 per hour	
New England States[2]		$2.36 per hour

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[1] Includes Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin.

[2] Includes Connecticut, Maine, Massachusetts, New Hampshire, Vermont, and Rhode Island.

The average Atlanta rate for all metalworking industries combined in 1961 was $2.05 per hour.[1] Based on a preliminary survey of non-union wage rates for the occupations required for the manufacture of computing machinery, the average Atlanta rate for this industry in 1962 is $1.93 per hour. However, $2.05 per hour is used for purposes of computations in this report.[2]

In the Computing and Accounting Machines Industry the average value of shipments per establishment in 1958 was $8.1 million. Based on the relationship of the value of shipments to production man hours expended for each of the above geographical locations and on the wage differentials existing between each of the locations and Atlanta,[3] an Atlanta plant having $8.1 million shipments in 1958 would have enjoyed the following minimum savings in production labor costs:

Savings of Atlanta plant over plant in North Central area = $812,119

Savings of Atlanta plant over New York plant = $307,380

Savings of Atlanta plant over California plant = $352,685

In the Office Machines, n.e.c. Industry, the average value of shipments per establishment in 1958 was $2.2 million. An Atlanta plant having this volume of shipments of machines in this industry in 1958 would have enjoyed the following savings over other plants computed by the method indicated above for the Computing and Accounting Machines Industry:

Savings of Atlanta plant over plant in North Central area = $65,780

Savings of Atlanta plant over plant in New England area = $66,608

Savings of Atlanta plant over New York plant = $40,172

The above indicated savings of an Atlanta plant are based on wage differentials existing between geographical locations and do not include savings which would come about because of differences in productivity between the

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[1] Only one of the 39 largest metalworking cities in the U. S. has a lower average wage rate for these industries. See Appendix 4 for metalworking rates for the major producing cities.

[2] The Atlanta wage rate was computed by taking the average non-union wage rate for each occupation required for the production of computing machinery and weighting each of these rates by the percentage employment in each occupation in a representative plant to obtain the overall average rate.

[3] See Appendix 2 for actual computations.

locations. There is considerable evidence that productivity is higher in Georgia than in more highly industrialized areas of the country.[1/]

The combination of lower wage rates and increased labor productivity would give an Atlanta plant a significant labor cost advantage over existing plants in other areas of the U. S.

Manpower Resources

The production of the mechanical and electro-mechanical machines involves basic metalworking fabrication operations such as pressing, milling, grinding, drilling, and assembly. Although the labor required for the more skilled operations is not available in quantity in the Atlanta area, semi-skilled and unskilled workers who can readily acquire the needed skills are found in abundance. Semi-skilled and unskilled personnel have proven their ability to quickly learn the skilled operations at such facilities as Lockheed-Georgia Corporation (which now employs approximately 14,000 people) and Southern States Equipment Corporation (employing approximately 400 workers). Many of the assembly operations required in the manufacture of the above machines can, of course, be performed by unskilled labor.

The production of electronic machines involves the use of highly skilled electronics engineers and technicians, as well as semi-skilled and unskilled labor. Atlanta is well equipped to supply electronics engineers and technicians to any electronics manufacturer in the area. Georgia Tech, one of the leading engineering schools in the U. S., now graduates 100 to 125 electronics engineers each year. Southern Technical Institute, a division of Georgia Tech, graduates 60 to 70 electronics technicians every year.

One of the problems facing these graduates for some time has been that of finding suitable employment in the Atlanta area. Evidence of the abundance of these highly trained people in the area is shown by the experience of one of the largest manufacturers of electronics equipment in the country in recently locating a major engineering facility in Atlanta. One of the vice presidents of the firm stated that the company had received far more applications for the Atlanta facility than it had required or expected. Noteworthy is the fact that many of these applications were requests from within the company for transfers to Atlanta.

[1/] See Charles H. Sewell, A Formula for Labor Productivity in Georgia, July 1961.

In 1962 over 3,800 students will graduate with bachelor's degrees in the Atlanta area. The degree breakdown is as follows:

Engineering	26.7%
Physical Sciences	11.1%
Business	18.6%
Liberal Arts	29.3%
Others	14.3%

Most of these graduates will be available for employment in the area.

Source of Raw Materials

The primary metallic materials used in the production of the mechanical and electro-mechanical machines are carbon and alloy steel mill shapes and forms; aluminum mill shapes and forms; and steel and aluminum castings. All of these materials are presently being manufactured in the Alabama-Georgia-Tennessee region. Fractional horsepower electric motors, which are sometimes purchased rather than manufactured by small manufacturers of office machines, are produced in Tennessee.

Transportation Facilities

Office machines are usually shipped by truck, whereas the materials used in their production are shipped by truck and rail. Atlanta is well equipped to handle the transportation requirements of the computing machines industries, since the city is served by more than 75 motor freight carriers, 7 railroads, and 6 air freight carriers. These carriers handle more freight traffic from Atlanta than from any other city in the South.

In addition, excellent transportacion facilities are available to transport company officials on business trips to any point in the U. S. There are more direct air line flights from Atlanta to major cities than from any other city in the South. Atlanta's Municipal Air Terminal serves 54 cities nonstop from Atlanta. It ranks third in the nation in number of commercial aircraft departures and sixth in number of passengers boarded.

Research Facilities

Since Atlanta is a research center, a manufacturer would be able to obtain either research or research personnel without difficulty.

Atlanta's research activities range from food technology to nuclear physics. Business and industry find a wide variety of research facilities and specialists in commercial, institutional, and government laboratories in the Atlanta area.

Georgia Tech's Engineering Experiment Station does $4,000,000 worth of research annually, utilizing approximately 350 full time research personnel, and about the same number of part time staff members.

Electrical and electronics research is of special importance in Atlanta. Georgia Tech alone does almost $1 million worth of research annually in these fields, along with a substantial amount of research in physics.

In addition, several companies, some of them offshoots of the Georgia Tech Engineering Experiment Station, are engaged in research and development as part of their business activities.

In addition to the research facilities of private business and industrial firms, nine commercial laboratories in the Atlanta area perform contract research and provide consultation services and testing facilities. These cover such diverse fields as building materials, biophysics, electronics, electrical engineering, physics, antenna measurement, textile and paper chemicals, and communication systems.

Plant Construction Costs

A leading Atlanta contractor will construct a standard industrial building in the Atlanta area ready for occupancy for $6 per square foot. According to Dodge construction statistics for 1960, non-residential construction cost is approximately 30% less in the Southeast than in the New York-Pennsylvania area. It is estimated, then, that a plant with 50,000 square feet of floor space in the Atlanta area would cost $300,000, whereas the same building in the New York-Pennsylvania area would cost $428,500. As a specific example, two buildings from the same plans were recently bid on in New Jersey and Atlanta. The bid on the New Jersey building was $95,000, on the Atlanta building, $60,000.

Property Taxes

Lower initial cost of plant construction in addition to lower assessment and tax rates in Atlanta would provide considerable savings in property taxes in this area. Tax comparisons are given below for unincorporated areas

of Atlanta, Chicago, and Buffalo on a new building with 50,000 square feet of floor space.

	Atlanta	Buffalo	Chicago
Initial Cost of Construction	$300,000	$428,500	$373,700
Assessment Rate	25%	49%	100%
Assessed Value	$75,000	$209,965	$373,700
Tax Rate per $1,000	$12.81	$20.56[1]	$23.80
Total Tax on Building	$960.75	$4,316.88	$8,894.06

These figures indicate a tax savings on the building alone of $7,933.31 over a Chicago location and $3,356.13 over a Buffalo location. Considerable savings over other industrialized areas have also been indicated.

Local Market

Although the manufacture of office machines is not market oriented, it is an advantage to have a substantial market near the plant. According to the 1958 Census of Business-Wholesale Trade, the Atlanta Standard Metropolitan Statistical Area wholesaled $52.1 million in Commercial Machinery and Equipment (including computing and accounting machines) compared to $27.6 million for Miami, $21.3 million for Memphis, and $12.9 million for the Tampa-St. Petersburg area. These are the largest wholesale cities for computing and accounting machinery in the Southeast.

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[1] The estimate is based on the ratio of total assessed value of county property for the fiscal year 1960-61 to total county property taxes collected for the same period.

APPENDIX 1

National Shipments of Computing and Accounting Machinery, 1956-1960
(in thousands of dollars)

	1956	1957	1958	1959	1960
Computing and Accounting Machines (SIC 3571)					
Accounting and Bookkeeping Machines	$115,597	$124,856	$103,861 ⎫	$317,804	$321,171
Punch Card Systems and Cash Registers	$187,393	195,924	194,498 ⎭		
Adding Machines	59,842	55,602	44,807	53,350	48,252
Calculating Machines	56,424	58,354	48,200	55,498	58,687
Electric Computers and Processing Equipment	93,557	145,113	319,057	313,765	472,489
Coded (Stored) Media Data Processing Machines	-	-	26,673	26,314	29,322
Coin and Currency Handling Machines	4,919	4,710	6,211	8,593	8,398
Rebuilt Computing and Accounting Machines, Cash Registers and others	15,767	21,337	37,485	54,052	54,326
Sub Total	$533,499	$605,896	$780,792	$829,376	$992,645
Computing and Accounting Machines, n.e.c. (SIC 3579)					
Autograph Registers	1,885	1,534	1,389	1,626	1,604
Dictating Machines	28,330	24,397	20,546	27,415	22,656
Check Handling Machines	10,911	11,389	13,118	14,953	17,060
Time Recording and Stamping Machines	8,759	8,191	11,077	10,898	9,431
Addressograph and Plate Embossing Machines	15,914	17,766 ⎫	68,096	81,849	88,657
Others	72,605	73,903 ⎭			
Sub Total	$138,404	$137,180	$114,226	$136,741	$139,408
Parts (Sold by Complete Line Manufacturer only)	$109,871	$123,286	$216,986	$264,999	$377,331
TOTAL	$781,774	$866,362	$1,112,004	$1,231,116	$1,509,384

Source: Current Industrial Reports, U. S. Department of Commerce,
Bureau of the Census

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APPENDIX 2

Labor Savings of an Atlanta Plant

The labor savings available because of differences in wage rates can be determined by multiplying the number of man hours required to produce a given volume of shipments in an area <u>by</u> the wage rate existing there, and then subtracting the comparable product for the Atlanta area as follows (assuming the Atlanta plant would require the same number of man hours as the plant to which it is being compared):

Number man hours required for given volume in Area A $\times$ wage rate in Area A, <u>less</u> number man hours required for same volume in Atlanta Area $\times$ wage rate in Atlanta Area.

Computing and Accounting Machines Industry (SIC 3571)

A. <u>Number of man hours required for $8.1 million shipments[1] in</u>:

North Central Area = $\dfrac{\$8,100,000}{\text{Value Shipments per man hour}} = \dfrac{\$8,100,000}{\$9.176 \text{ per man hour}} = 882,738$ man hours

New York Area = $\dfrac{\$8,100,000}{\text{Value Shipments per man hour}} = \dfrac{\$8,100,000}{\$15.284 \text{ per man hour}} = 529,966$ man hours

California Area = $\dfrac{\$8,100,000}{\text{Value Shipments per man hour}} = \dfrac{\$8,100,000}{\$11.024 \text{ per man hour}} = 734,761$ man hours

B. <u>Labor Savings Compared to</u>:

North Central plant = (882,738 man hours $\times$ $2.97) <u>minus</u>
(882,738 man hours $\times$ $2.05) = $812,119

New York plant = (529,966 man hours $\times$ $2.63) <u>minus</u>
(529,966 man hours $\times$ $2.05) = $307,380

California plant = (734,761 man hours $\times$ $2.53) <u>minus</u>
(734,761 man hours $\times$ $2.05) = $352,685

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[1] The volume of shipments used for each industry is approximately the average shipment per plant in each industry in 1958.

APPENDIX 2 (Cont'd)

Typewriter Industry (SIC 3572)

A. **Number of man hours required for \$13.2 million shipments[1] in:**

Average U. S. plant = $\dfrac{\$13,200,000}{\text{Value shipments per man hour}} = \dfrac{\$13,200,000}{\$8.006 \text{ per man hour}} = 1{,}648{,}763$ man hours

New York plant = $\dfrac{\$13,200,000}{\text{Value shipments per man hour}} = \dfrac{\$13,200,000}{\$7.169 \text{ per man hour}} = 1{,}841{,}261$ man hours

B. **Labor Savings Compared to:**

Average U. S. plant = (1,648,763 man hours × \$2.17) minus
(1,648,763 man hours × \$2.05) = \$197,852

New York plant = (1,841,261 man hours × \$2.09) minus
(1,841,261 man hours × \$2.05) = \$73,650

Computing and Accounting Machines Industry, n.e.c. (SIC 3579)

A. **Number of man hours required for \$2.2 million shipments[1] in:**

North Central plant = $\dfrac{\$2,200,000}{\text{Value shipments per man hour}} = \dfrac{\$2,200,000}{\$15.719 \text{ per man hour}} = 139{,}958$ man hours

New England plant = $\dfrac{\$2,200,000}{\text{Value shipments per man hour}} = \dfrac{\$2,200,000}{\$10.239 \text{ per man hour}} = 214{,}865$ man hours

New York plant = $\dfrac{\$2,200,000}{\text{Value shipments per man hour}} = \dfrac{\$2,200,000}{\$12.048 \text{ per man hour}} = 182{,}603$ man hours

B. **Labor Savings Compared to:**

North Central plant = (139,958 man hours × \$2.52) minus
(139,958 man hours × \$2.05) = \$65,780

New England plant = (214,865 man hours × \$2.36) minus
(214,865 man hours × \$2.05) = \$66,608

New York plant = (182,603 man hours × \$2.27) minus
(182,603 man hours × \$2.05) = \$40,172

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[1] The volume of shipments used for each industry is approximately the average shipments per plant in each industry in 1958.

Electric Typewriters -- A Corollary Manufacturing Opportunity

In addition to the products covered in the body of the report, opportunities for additional profits also exist for manufacturers of electric typewriters to put branches in the Atlanta area. These units are manufactured in the same manner as the electro-mechanical machines described in the Introduction and are distributed in the same manner as most products covered in the text.

Market Growth

National shipments from 1956-1960 were as follows (in thousands of dollars):

	1956	1957	1958	1959	1960
Standard Electric (non-portable)	$58,187	$59,479	$55,388	$75,198	$81,146

Foreign made electric typewriters have not significantly infringed on the American market. In 1960, only 7,458 electrics were imported compared to 287,488 shipped by U. S. plants (of which 16,252 were exported).[1] Obviously, imports of electric machines are not yet a threat to U. S. producers. Based on the least squares trend of typewriter shipments from 1956 through 1960, U. S. shipments should reach $109.0 million in 1965.[2]

Atlanta as a Location

Atlanta offers the same advantages to a manufacturer of electric typewriters that exist for manufacturers of computing and accounting machinery. The per cent labor savings would vary, however, and are described in detail below.

Labor Savings

Production wages amounted to 28.1% of shipment value in the entire Typewriter Industry (SIC 3572) in 1958, according to the census data, whereas the cost of materials, parts, containers, and supplies totaled 26.2% of the value. Obviously, production wages account for a significant portion of total

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[1] See Typewriter Industry, Outlook for 1962 and Review of 1961, Business and Defense Services Administration, U. S. Department of Commerce, December 1961.

[2] Least squares estimating equation: $Y = \$65,879,600 + \$6,163,700X$
(X Origin: 1956)

production costs. Typical wage rates for the industry in 1958 were as
follows:

U. S. Average Wage Rate = $2.17 per hour

New York Wage Rate = $2.09 per hour

The Atlanta rate in 1962 is $1.93 per hour. The average value of shipment
per establishment in 1958 was $13.2 million. An Atlanta plant having this
volume of shipments could have enjoyed the following savings over existing
plants:[1]/

Savings over a plant paying average U. S. wage rate = $197,852

Savings over a New York plant = $73,650

As indicated in the body of this report, additional savings can be
expected because of the high productivity of labor in the Atlanta area.

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[1]/ See Appendix 2 for actual computations.

Wage Rates of the Major Metalworking Areas, September 1961

Area	Average Hourly Earnings	Percentage Difference to Atlanta	Area	Average Hourly Earnings	Percentage Difference to Atlanta
Youngstown	$3.04	+48	Chicago	$2.55	+24
Flint	3.00	+46	Cincinnati	2.54	+23
Detroit	2.97	+44	Columbus	2.54	+23
San Francisco	2.90	+41	Indianapolis	2.54	+23
Pittsburgh	2.86	+39	Gary	-- *	
Dayton	2.85	+39	Grand Rapids	2.52	+22
San Diego	2.84	+38	South Bend	-- *	
Lansing	2.76	+34	Baltimore	2.50	+21
Seattle	2.76	+34	Bridgeport	2.47	+20
Toledo	2.75	+34	Kansas City	2.47	+20
Cleveland	2.74	+33	Philadelphia	2.48	+20
Buffalo	2.73	+33	Syracuse	2.46	+19
Los Angeles	2.70	+31	Hartford	2.45	+19
Milwaukee	2.70	+31	Newark-Jersey City	2.44	+19
Houston	2.68	+30	Boston	2.36	+15
Birmingham	2.61	+27	New York	2.34	+14
St. Louis	2.61	+27	Worcester	2.29	+11
Minneapolis-St. Paul	2.58	+25	Dallas-Ft. Worth	2.20	+ 7
Rochester	2.58	+25	Atlanta	2.05	
Wichita	2.58	+25	Lancaster-York	2.02	- 1

* Not Available

Source: Employment and Earnings, Bureau of Labor Statistics, U. S. Department of Labor.

FIGURE 1
EMPLOYMENT IN THE COMPUTING AND ACCOUNTING MACHINES INDUSTRY (SIC 3571)

1.6%

38.0%

38.4%

11.6%

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FIGURE 2
EMPLOYMENT IN THE COMPUTING AND ACCOUNTING MACHINES INDUSTRY, n.e.c. (SIC 3579)

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FIGURE 3
EMPLOYMENT IN THE TYPEWRITER INDUSTRY (SIC 3572)

40.0%

35.0%

2.9%

7.2%

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