HARDWOOD DIMENSION STOCK

A Manufacturing Opportunity in Georgia

by

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Foreword

The extensive opportunities for manufacturers in the wood products field are illustrated again with this analysis of hardwood dimension stock as a manufacturing opportunity in Georgia. Like most of the reports in this series, this one identifies a large and growing market for a product which can be profitably produced in Georgia. The availability of needed raw material, a substantial market within the state, and proximity to furniture manufacturing centers outside Georgia combine to offer excellent potentials.

Inquiries for additional specifics from interested companies will be welcomed. Any data developed in response to such inquiries will be held in strictest confidence.

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Acknowledgments

Summary

Hardwood dimension stock production in the United States increased from $60,287,000 in 1954 to $146,706,000 in 1962, an annual rate of growth of 10.4%.

Three significant factors have contributed to the growth of the industry. They are the continuous increase in personal consumption expenditures in the American economy, spending at 1.4% to 1.6% of total personal consumption expenditures on furniture purchases, and the increasing separation of hardwood dimension stock manufacture from furniture production.

Furniture manufacture is the major outlet for hardwood dimension stock. Many furniture plants have turned to purchasing dimension parts instead of making them for various economic reasons, notably, the advantages of specialization, savings on equipment investment, lumber inventory, and freight costs, elimination of the waste disposal problem, and precise knowledge of raw material costs.

The market for hardwood dimension stock is estimated at $165 million for 1964 and is projected to $176 million in 1965 and $217 million by 1970. The major consuming states are North Carolina, California, New York, Illinois, Ohio, Indiana, Michigan, and Virginia. The major producing states are North Carolina, Tennessee, New York, Mississippi, Michigan, and Kentucky.

Georgia has an ample supply of hardwood saw timber and a market of sufficient size to support an expanded hardwood dimension stock industry. The state is also in reasonable proximity to many furniture manufacturing centers.

Manufacture of hardwood dimension stock is highly oriented to hardwood timber resources. Georgia compares well in hardwood timber volume among the 12 southern states and is well stocked with the four major wood species used in furniture manufacture in the South -- poplar, gums, oaks, and maples. The state's hardwood timber resources are concentrated mainly in two areas -- the northern tip and the east-central part of the state. Within a 50-mile radius of Ellijay in extreme north Georgia, the hardwood saw-timber volume is estimated at 3,951,600,000 board feet, with oak and hickory predominating. Within a 50-mile radius of Dublin in the east-central section, the hardwood saw-timber volume is estimated at 3,282,600,000 board feet, with gums, poplar, and maples the leading hardwood species.

According to a survey of woodworking firms in Georgia conducted for this study, the demand for hardwood dimension stock in the state is estimated at $5 million annually, of which about 70% is supplied by out-of-state sources. Leading states in supplying the Georgia market are the Carolinas, Tennessee, Louisiana, and Kentucky. The major items in demand are completely machined wood parts, turnings, squares, semi-fabricated wood parts, upholstery-frame parts, carvings, moldings, and clear panels.

The survey revealed approximately 11 hardwood dimension parts producers in Georgia, not counting numerous lumber mills which produce an insignificant volume at infrequent intervals. These 11 producers are mostly small or medium-sized operations and none is recognized as a major competitor in the market. The total output of these 11 producers was $1,506,000 in the 1963-1964 period, far below the estimated demand in the state.

A 300-mile radius of Ellijay includes six of the 15 major furniture manufacturing centers in the East. The market for hardwood dimension stock in this radius is estimated at $33,589,000 annually.

Of the 50 major hardwood dimension stock producers in the nation, most are located in a belt extending from the Gulf states to Tennessee, Kentucky, North Carolina, and Virginia. Although surrounded by these major producers, an efficient dimension parts manufacturer in Georgia still could compete effectively. In comparing freight rates to the major furniture manufacturing centers in the East, the two illustrative Georgia locations generally would have an edge over producers in the Gulf states and would be at only a slight disadvantage in relation to those located in the triangle area of Tennessee, North Carolina, and Virginia. Because of the variety of dimension items produced, the diversity of wood species used, the lack of special handling requirements in shipping, and low transportation cost in relation to commodity value, hardwood dimension stock is highly adaptable to interstate commerce.

A model hardwood dimension plant capable of producing 15,000 board feet daily would require approximately $110,000 for land and building, $86,000 for auxiliary facilities, $72,000 for semi-finished dimension part machinery, and $176,000 for completely finished dimension part machinery. A plant of such size would need about 38 persons to operate it.

INTRODUCTION

Product Definition and End Uses

Hardwood dimension stock can be defined as a product made by drying and machining hardwood lumber into forms suitable for further processing and use in various end products. There are three basic types of hardwood dimension stock -- rough hardwood dimension parts, surfaced and semi-finished hardwood dimension parts, and completely finished hardwood dimension parts.

Rough hardwood dimension parts consist of blanks, sawed and ripped to specific sizes. Semi-finished hardwood dimension parts are rough dimension parts carried one or more steps further in the manufacturing process. They may include one or more of several operations, such as edge or face gluing, surfacing, molding, tenoning, drum-sanding, equalizing, trimming, and mitering. Completely finished hardwood dimension parts are dimension parts that are completely machined or fabricated, with no additional machining to be done by the customer with the possible exception of polish sanding.

Hardwood dimension stock is purchased by manufacturers of furniture, toys, bobbins, shuttles, boxes, caskets, clocks, kitchen cabinets, handles, truck and trailer bodies, and similar products. By and large, furniture manufacture is the predominant outlet for hardwood dimension stock.

Purpose and Scope of Study

The purpose of this study is to provide pertinent information on the marketing and manufacture of hardwood dimension stock to serve as a useful guide in setting up such a plant in Georgia. The study can also be used as a reference for those who are already in the business but intend to expand their scale of production as well as their share of the market.

The study is presented in three main parts. The first part gives historical data about the growth of the industry. The geographical distribution of the demand for and the supply of hardwood dimension stock in the United States is given by region and state.

The feasibility of manufacturing hardwood dimension stock in Georgia is discussed next. A comparison of hardwood timber resources by individual wood species is made for the 12 southern states. Two Georgia areas with

concentrated hardwood timber resources are identified, followed by an exhaustive analysis of the hardwood dimension stock supply and demand situation in the state. The market potentials for Georgia-based plants are estimated, and freight rates from Georgia-based plants to major furniture manufacturing centers in the nation are compared with those for the major dimension stock producers in the South.

The third section lists the possible investment costs for a hardwood dimension plant of the minimum economic size. The advantages of such a plant also are illustrated.

Methodology

Information for this study was obtained largely through personal interviews and correspondence. A large body of statistical data was collected from many public and private sources; however, the data concerning the demand for and the supply of hardwood dimension stock in Georgia were obtained by means of two separate mail surveys of woodworking concerns in the state.

PRODUCTION AND DISTRIBUTION OF HARDWOOD DIMENSION STOCK
IN THE UNITED STATES

The Increasing Market for Hardwood Dimension Stock

Production of hardwood dimension stock for furniture and vehicle stock
used to be an integral part of furniture manufacture or a secondary product in
a hardwood lumber mill. It has gradually become an independent enterprise in
its own right in recent years. To be sure, most furniture plants still produce
dimension parts for their own use, but the trend toward purchasing these parts
is accelerating. There are more independent hardwood dimension stock producers
today than ever, and the production of hardwood dimension stock in many hard-
wood lumber mills is gaining in importance.

According to a survey made by the Hardwood Dimension Manufacturers Asso-
ciation, approximately 76% of all prefabricated hardwood parts go to the fur-
niture and cabinet industries. About 15% are consumed by the building trade
in the form of interior trim and molding or stair treads and risers. The
balance of 9% goes to all types of industrial wood parts and vehicle stock.
Since the furniture and cabinet industries are the major outlets for hardwood
dimension parts, their increasing tendency to purchase the parts is the major
factor contributing to the growth of the hardwood dimension industry.

Data on hardwood dimension stock production in the United States are
available for 1954 and for the period from 1958 to 1962 on a consistent and
uniform basis. According to U. S. Government data, production in terms of the
value of shipments[1] increased from $60,287,000 in 1954 to $146,706,000 in 1962.
In the eight-year period, the increase was 143%, or an annual compounded rate
of growth of 10.4%. The growth has been consistent and steady.

The trend toward production of hardwood dimension stock independently
from furniture manufacture is clearly indicated by the ratio of value of ship-
ments of hardwood dimension stock to personal consumption expenditures on fur-
niture. As shown in Table 1, the value of shipments of hardwood dimension

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[1] The value of shipments, according to the definition by the U. S. Census
of Manufactures, includes all items made by each establishment from materials
owned by it, whether sold, transferred to other plants of the same company, or
shipped on consignment. An establishment is defined here as a firm specializ-
ing or partially specializing in the manufacture of hardwood dimension stock.

stock was 1.85% of personal consumption expenditures on furniture in 1954. The ratio steadily increased to 2.89% in 1962. These statistics indicate not only the steady growth for both the furniture industry and the hardwood dimension stock industry, but also the faster rate of the growth of the hardwood dimension industry. Theoretically, of course, the hardwood dimension stock industry cannot outgrow the furniture industry because of the dependency of hardwood dimension stock on the furniture industry as the dominant outlet. The steady increase of the ratio indicates only that furniture manufacturers have bought hardwood dimension stock at an accelerated rate in relation to the growth of the furniture industry itself.

Table 1

PERSONAL CONSUMPTION EXPENDITURES ON FURNITURE
COMPARED WITH VALUE OF SHIPMENTS OF HARDWOOD DIMENSION STOCK
IN THE UNITED STATES, 1954 TO 1962

Year	(A) Personal Consumption Expenditures on Furniture (in millions of dollars)	(B) Value of Shipments of Hardwood Dimension Parts and Vehicle Stock (in thousands of dollars)	(B) as a Per Cent of (A)
1954	3,265	60,287	1.85
1955	3,671	n. a.	-
1956	4,432	n. a.	-
1957	4,456	n. a.	-
1958	4,488	102,895	2.29
1959	4,866	121,216	2.49
1960	4,820	132,552	2.76
1961	4,761	132,966	2.79
1962	5,070	146,706	2.89

Note: n. a. = not available.

Sources: A - Survey of Current Business, U. S. Department of Commerce, Office of Business Economics, Washington, D. C.

B - Annual Survey of Manufactures and Census of Manufactures, U. S. Department of Commerce, Bureau of the Census, Washington, D. C.

Several major economic factors which have caused many furniture producers
to purchase hardwood dimension stock instead of making it themselves are summa-
rized below:

1. The advantages of specialization: It is advantageous for furniture
producers to locate their firms in population centers where the furniture mar-
ket is. However, the high costs of land, building, and labor in a highly devel-
oped area make it prohibitive for a furniture company to put up such facilities
as a large wood yard and a dry kiln for processing hardwood lumber into dimen-
sion parts. Consequently, many established furniture companies prefer to limit
their operations to the designing, assembling, and marketing of furniture, pur-
chasing dimension parts from suppliers. On the other hand, a hardwood dimen-
sion plant logically can be located in a remote area close to hardwood timber
resources, with the concomitant advantages of low costs in land value and labor.

2. Saving on equipment: The manufacture of furniture dimension stock
requires numerous specialized machines and facilities which are expensive.
Keeping these machines and facilities in full use is another problem. It is
usually more economical to purchase many odd furniture parts than to make them,
even though a furniture company may have all needed machines and facilities.
By purchasing dimension parts, a furniture company can save a great deal on
fixed investments and maintenance and overhead costs.

3. Saving on lumber inventory: A large inventory of lumber of various
wood species is required in order to meet demands. By purchasing dimension
parts, a furniture company can eliminate the need of maintaining a large lumber
inventory.

4. Saving on freight costs: Location of a furniture plant close to the
market reduces transportation costs on wood furniture, which is much more dif-
ficult to ship than wood dimension parts. According to a cost study made by
the furniture industry, new material costs (mostly lumber) comprise from 45% to
50% of the sales dollar, while the yield of lumber in making dimension parts
at best is 50% (from air-dry lumber to kiln-dry finished parts). By purchasing
dimension parts, a furniture company pays only the freight costs of finished
furniture parts which are ready for assembling.

5. No waste problem: Disposing of wood waste is a problem to many wood-
working concerns. By purchasing dimension parts, the problem is avoided.

6. _Knowledge of exact raw material costs_: Since lumber is the major component in furniture manufacture, it is important to know the exact cost of each dimension part made. Because of the green and rough nature of raw lumber, many furniture makers cannot establish a definite cost system on material used. In a competitive market, a precise knowledge of the cost of material used can mean the difference between profit and loss in the business. If dimension parts are purchased, the exact cost of each part is known.

The Projected Demand for Hardwood Dimension Stock

The future growth of the hardwood dimension industry can be projected on the basis of two important relationships. The first relationship is between total personal consumption expenditures and the personal consumption expenditures on furniture in the United States. As shown in Table 2, personal consumption expenditures on furniture have averaged between 1.4% and 1.6% of total personal consumption expenditures since 1947. Because of the growth nature of the American economy and the ever increasing level of personal income in the nation, the relationship between the two factors is significant as an indication of further growth of the hardwood dimension industry.[1]

The second relationship is between total personal consumption expenditures on furniture and the value of shipments of hardwood dimension parts and vehicle stock. The detailed statistics are shown in Table 1, and the definite relationship between the two factors can be established by statistical correlation.[2]

As a consequence of the two significant relationships mentioned, the demand for hardwood dimension stock in terms of the value of shipments in the

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[1] Linear correlation between total personal consumption expenditures (X) and personal consumption expenditures on furniture (Y):

Estimating equation (in billions of dollars) $Y = 0.513 + 0.0131 X$
Coefficient of correlation $r = 0.97$
Standard error of estimate $s = 0.198$

[2] Linear correlation between personal consumption expenditures on furniture (X) (in billions of dollars) and the value of shipments of hardwood dimension stock (Y) (in millions of dollars):

Estimating equation $Y = -91.7883 + 45.7181 X$
Coefficient of correlation $r = 0.966$
Standard error of estimate $s = 7.393$ (in millions of dollars)

Table 2

TOTAL PERSONAL CONSUMPTION EXPENDITURES COMPARED WITH
PERSONAL CONSUMPTION EXPENDITURES ON FURNITURE
IN THE UNITED STATES, 1947 TO 1963

Year	Personal Consumption Expenditures (in millions of dollars)		(B) as a Per Cent of (A)
	Total (A)	On Furniture (B)	
1947	165,409	2,700	1.63
1948	178,313	2,920	1.64
1949	181,158	2,820	1.56
1950	195,013	3,286	1.68
1951	209,805	3,350	1.60
1952	219,774	3,229	1.47
1953	232,649	3,294	1.42
1954	238,025	3,265	1.37
1955	256,940	3,671	1.43
1956	269,917	4,432	1.64
1957	285,164	4,456	1.56
1958	293,198	4,488	1.53
1959	313,538	4,866	1.55
1960	328,232	4,820	1.47
1961	337,347	4,761	1.41
1962	356,754	5,070	1.42
1963	374,959	5,395	1.44

Source: Survey of Current Business, U. S. Department of Commerce,
Office of Business Economics, Washington, D. C.

United States can be projected to 1965 and 1970. Table 3 indicates the pro-
jected value of shipments for hardwood dimension stock along with the projected
total personal consumption expenditures and the projected personal consumption
expenditures on furniture. These projected figures are consistent with past
trends; both are presented in Figure 1. By 1970, the value of shipments for
hardwood dimension stock should be around $217 million, or 3.2% of the personal
consumption expenditures on furniture. The growth trend is steady in both ab-
solute and relative terms.

FIGURE 1

TOTAL PERSONAL CONSUMPTION EXPENDITURES, PERSONAL CONSUMPTION EXPENDITURES ON FURNITURE, AND VALUE OF SHIPMENTS OF HARDWOOD DIMENSION STOCK, THE UNITED STATES, 1947 TO 1970
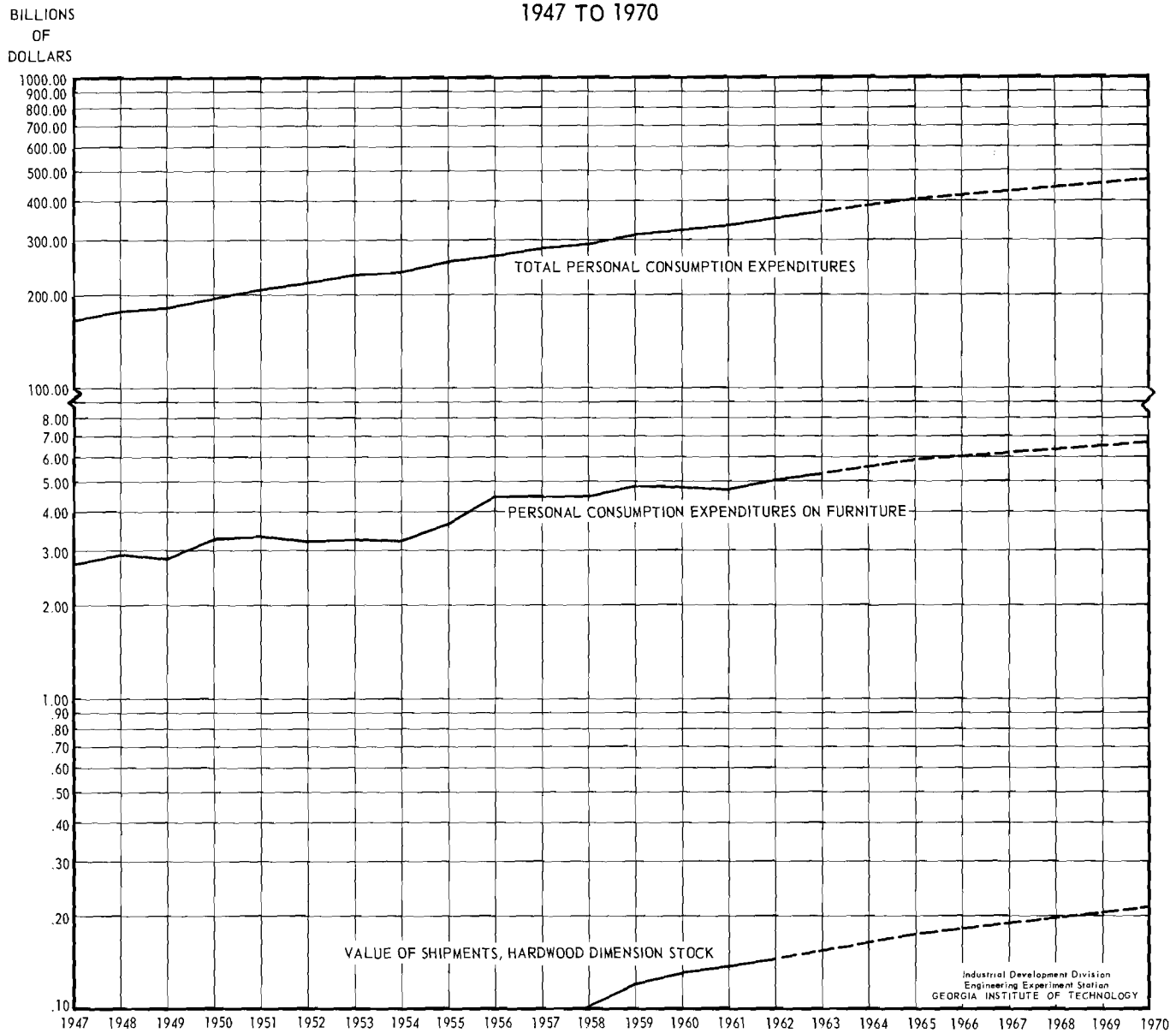
Table 3

PROJECTED TOTAL PERSONAL CONSUMPTION EXPENDITURES,
PERSONAL CONSUMPTION EXPENDITURES ON FURNITURE,
AND VALUE OF SHIPMENTS OF HARDWOOD DIMENSION STOCK
IN THE UNITED STATES, 1965 AND 1970

Year	(A) Personal Consumption Expenditures (in millions of dollars)	(B) Personal Consumption Expenditures on Furniture (in millions of dollars)	(B) as a Per Cent of (A)	(C) Value of Shipments of Hardwood Dimension Stock (in millions of dollars)	(C) as a Per Cent of (B)
1965	408,000	5,858	1.44	176	3.0
1970	476,000	6,749	1.42	217	3.2

Figure 1 shows the three trend lines on a semi-log scale. The trend line for total personal consumption expenditures has the steepest-rising curve of the three, followed by the value of shipments of hardwood dimension stock and personal consumption expenditures on furniture. The more irregular trend of personal consumption expenditures on furniture may be caused by the business cycles which are generally recognized as existing in the furniture industry.

Geographical Distribution of the Market for Hardwood Dimension Stock

Since the furniture industry is the major outlet for hardwood dimension stock, its production volume in individual regions should give a reasonable estimate of the demand for hardwood dimension stock. Although the building trade and vehicle-body manufacturing account for 24% of the total dimension volume, no statistics of a similar nature are available on a geographical basis for these two industries.

The value added by manufacture in the furniture and fixtures industry may be the best indicator of furniture production volume in various areas. Table 4 presents the latest statistics from the Annual Survey of Manufactures, 1962 for 25 states in eight geographic divisions.[1]

_1/ Geographical groupings are based on the nine divisions established by the U. S. Bureau of the Census and are used in reporting production and plant data. Except for the statistics for the Mountain Division, which are not available, data for all divisions are presented in Table 4.

Table 4

ESTIMATED MARKET FOR HARDWOOD DIMENSION STOCK,
BY DIVISION AND BY STATE, 1964

Division and State	Furniture and Fixtures, Value Added by Manufacture, Adjusted, 1962 (in thousands of dollars)	Per Cent of U. S.	Estimated Market for Hardwood Dimension Stock (in thousands of dollars)
United States	2,837,663	100.00	165,000
New England	143,158	5.04	8,316
New Hampshire	12,771	0.45	742
Vermont	12,438	0.44	726
Massachusetts	73,900	2.60	4,290
Middle Atlantic	529,156	18.65	30,772
New York	282,065	9.94	16,401
New Jersey	77,006	2.71	4,471
Pennsylvania	170,095	6.00	9,900
East North Central	733,686	25.85	42,652
Ohio	170,942	6.02	9,933
Indiana	165,366	5.83	9,619
Illinois	183,964	6.48	10,692
Michigan	165,403	5.83	9,619
Wisconsin	48,011	1.69	2,789
West North Central	102,037	3.60	5,940
Minnesota	21,511	0.76	1,254
South Atlantic	636,271	22.42	36,993
Maryland	35,582	1.25	2,062
Virginia	148,501	5.23	8,629
North Carolina	332,150	11.35	18,727
South Carolina	21,069	0.74	1,221
Florida	45,961	1.62	2,673
East South Central	169,102	5.96	9,834
Kentucky	28,215	0.99	1,663
Tennessee	88,455	3.12	5,148
Alabama	17,207	0.61	1,006
West South Central	141,668	4.99	8,233
Arkansas	47,320	1.67	2,755
Texas	72,100	2.54	4,191
Pacific	318,322	11.22	18,513
Washington	17,491	0.62	1,023
Oregon	16.556	0.58	957
California	278,501	9.81	16,186

Source: Annual Survey of Manufactures, U. S. Department of Commerce, Bureau of the Census, Washington, D. C.

Based on the projected value of shipments for hardwood dimension stock in 1964, the U. S. market for this industry is proportionally broken down in Table 4 by divisions and states, according to the volume of furniture production in 1962. It should be noted that the value of shipments includes not only all items made for sale but also items transferred to other plants of the same company. The estimate made of the distribution of the market for hardwood dimension stock is intended only as a rough guide.

Georgia is not listed in Table 4 because of the lack of statistics on the value added by manufacture, furniture and fixtures, for the state. The supply of and demand for hardwood dimension stock in Georgia are covered by several surveys reported in a subsequent section.

The 1964 market for hardwood dimension stock in the United States is projected at $165 million. The East North Central Division leads the nation with $42,652,000 or 25.85% of the total, followed by the South Atlantic Division with $36,993,000 or 22.42% and the Middle Atlantic Division with $30,772,000 or 18.65%. Next in line are the Pacific (11.22%), the East South Central (5.96%), the New England (5.04%), the West South Central (4.99%), and the West North Central (3.6%) divisions.

The leading states in demand for hardwood dimension parts are North Carolina with $18,727,000 or 11.35%, California with $16,186,000 or 9.81%, and New York with $16,401,000 or 9.94%. Other important states are Illinois, Ohio, Indiana, Michigan, and Virginia.

Geographical Distribution of the Supply of Hardwood Dimension Stock

The distribution of the supply of hardwood dimension stock in the United States is indicated by the value of shipments in this industry.[1] The value of shipments of hardwood dimension stock for the various regions and states is available in the U. S. Census of Manufactures, 1958. The more recent statistics for 1963 should be available sometime in 1965.

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1/ The value of shipments, according to the Census definition, refers to net selling values, f.o.b. plant, after discounts and allowances, and excluding freight charges and excise taxes. It includes all items made by or for each establishment from materials owned by it, whether sold, transferred to other plants of the same company, or shipped on consignment.

The estimated current supply of hardwood dimension stock is based on the 1958 value of shipments of this industry and the projected value for 1964. The East South Central Division leads the nation with $41,481,000 or 25.14% of the total, followed by the South Atlantic with $32,488,000 or 19.69% and the West South Central with $21,631,000 or 13.11%. Thus, the South, consisting of these three regions, accounts for $95,600,000, or 57.94% of the total supply.

The major producing states are North Carolina, Tennessee, New York, Mississippi, Michigan, and Kentucky. Detailed estimates are given in Table 5.

Tables 4 and 5, examined together, reveal the most likely markets for hardwood dimension stock. Massachusetts, New York, Pennsylvania, Ohio, Indiana, Illinois, Virginia, Florida, and California can be classified as the best markets for hardwood dimension stock producers, while Tennessee, Mississippi, Arkansas, Kentucky, Louisiana, and Missouri are the major supplying states. Although North Carolina has the largest production and consumption, the two almost cancel each other. New York has a large production volume, but its consumption exceeds production.

It should be noted that hardwood dimension stock is basically an interstate commodity because of specialization in manufacture, the variety of wood species used, and the high commodity value relative to transportation cost. A state with a high volume of production and consumption, such as North Carolina, still commands an important place in the interstate traffic in hardwood dimension stock.

As indicated in Table 5, Georgia provides about 2.22% of the total supply of hardwood dimension stock. However, nearly 60% of the supply in Georgia is for captive consumption. In terms of the open-market supply, Georgia has not yet become an important supplier. This topic is discussed in detail in the following chapter.

Table 5

ESTIMATED VALUE OF SHIPMENTS OF HARDWOOD DIMENSION STOCK,
BY DIVISION AND BY STATE, 1964

Division and State	Hardwood Dimension Stock Value of Shipments, 1958 (in thousands of dollars)	Per Cent of U. S.	Estimated Hardwood Dimension Stock Value of Shipments, 1964 (in thousands of dollars)
United States	102,895	100.00	165,000
New England	6,283	6.11	10,081
Maine	2,013	1.96	3,234
New Hampshire	1,066	1.04	1,716
Vermont	1,972	1.92	3,168
Middle Atlantic	12,583	12.23	20,179
New York	8,912	8.66	14,289
New Jersey	1,679	1.63	2,689
Pennsylvania	1,992	1.94	3,201
East North Central	13,381	13.00	21,450
Ohio	1,539	1.50	2,475
Indiana	2,354	2.29	3,778
Illinois	1,990	1.93	3,184
Michigan	5,770	5.61	9,256
Wisconsin	1,728	1.68	2,772
West North Central	4,109	3.99	6,583
Missouri	3,365	3.27	5,395
South Atlantic	20,259	19.69	32,488
Virginia	1,827	1.78	2,937
West Virginia	1,172	1.14	1,881
North Carolina	11,569	11.24	18,546
South Carolina	1,625	1.58	2,607
Georgia	2,282	2.22	3,663
East South Central	25,873	25.14	41,481
Kentucky	5,362	5.12	8,596
Tennessee	10,440	10.15	16,747
Alabama	1,963	1.91	3,151
Mississippi	8,108	7.88	1,300
West South Central	13,487	13.11	21,631
Arkansas	6,470	6.29	10,378
Louisiana	4,353	4.23	6,979
Pacific	6,900	6.71	11,071
Washington	2,690	2.61	4,306
California	3,596	3.49	5,758

Source: U. S. Census of Manufactures, U. S. Department of Commerce, Bureau of
the Census, Washington, D. C.

HARDWOOD DIMENSION STOCK MANUFACTURE IN GEORGIA

Timber Resources

The manufacture of hardwood dimension stock is primarily timber-oriented. North Carolina, the largest wood furniture producer in the nation and Georgia's neighbor, gives some meaningful indication of what wood species are important for the manufacture of hardwood dimension parts for furniture uses. According to a survey made in North Carolina in 1958, poplar, gums, oaks, and maples accounted for 73.3% of all domestic lumber received by the furniture plants in the state. In contrast, walnut and cherry, which are the most popular species for furniture, accounted for only 7%. These two species were largely received from Tennessee, Virginia, West Virginia, New York, and Pennsylvania. Their uses are largely for furniture veneer, not for furniture dimension parts. The use of oak in furniture is reported to be increasing as a result of the promotion efforts of the oak lumber producers in the last five years.

Georgia and South Carolina used to be the major suppliers of hardwood lumber to furniture manufacturers in North Carolina; however, the volume of Georgia lumber shipped to North Carolina for manufacturing furniture has been declining because of competition from northern and southwestern states. In 1958, as shown in Table 6, Georgia supplied about 12.5% of the poplar, 9.6% of the gums, 5.3% of the oaks, and 7% of the maples used in North Carolina.

Reports from various trade sources indicate that an increasing volume of hardwood dimension parts for furniture has been shipped to the major furniture manufacturing centers in the nation from southern producers in recent years. In view of the demand for hardwood lumber by the furniture industry in North Carolina and Georgia's declining share of that market, an effort in the direction of marketing hardwood dimension parts instead of lumber might well be made.

As an indication of Georgia's relative position among the southern states in regard to hardwood timber resources, Table 7 lists saw-timber volume by major wood species and by individual state. In terms of total saw-timber volume, Georgia is exceeded only by Louisiana, North Carolina, and Virginia. Georgia has impressive volumes of the four major wood species (poplar, gums, oaks, and maples) which are the mainstays of wood furniture manufacture in the South.

Other minor species, such as hackberry, walnut, sycamore, pecan, elm, beech, and cottonwood, also are available in Georgia.

Table 6

DOMESTIC LUMBER USED BY FURNITURE PLANTS IN NORTH CAROLINA,
BY WOOD SPECIES, AND AMOUNT SUPPLIED BY GEORGIA, 1958

Wood Species	Total Lumber Received (in thousands of board feet)	Per Cent of Total of All Species	Lumber Received from Georgia (in thousands of board feet)	Georgia Per Cent of Total Received
Poplar	106,278	34.6	13,288	12.5
Gums	60,105	19.6	5,774	9.6
Oaks	37,797	12.3	2,013	5.3
Maples	20,914	6.8	1,466	7.0
Yellow pine	15,141	4.9	-	-
Hackberry	11,880	3.9	502	4.2
Walnut	11,790	3.8	-	-
Cherry	9,953	3.2	-	-
Sycamore	9,093	3.0	243	2.7
Pecan	8,630	2.8	13	0.1
Elm	4,858	1.6	127	2.6
Other hardwoods	10,851	3.5	467	4.3
Total	307,290	100.0	23,893	7.8

Source: Richard C. Rodenbach, Sources of Lumber for Furniture Plants in North Carolina, Southeastern Forest Experiment Station, Forest Service, U. S. Department of Agriculture, Asheville, North Carolina, July, 1960.

The hardwood resources in Georgia vary according to topography, river, soil, and climate. Oaks and hickory are dominant in the mountainous northern region, while oaks, poplar, and maples are scattered over the Piedmont Plateau in the middle part of Georgia. The bottomland hardwoods, such as gums, cottonwood, walnut, and ash, follow streams and swamps in the southeastern part of the state.

The concentration of hardwood timber resources in various parts of Georgia can be indicated by the volume of hardwood saw timber in each county. (See

Table 7

VOLUME OF HARDWOOD SAW TIMBER ON COMMERCIAL FOREST LAND, BY SPECIES, IN THE SOUTHERN STATES
(in millions of board feet)

Species	La. 1954	N. C. 1955	Va. 1957	Ga. 1961	Ala. 1963	Ark. 1959	Tenn. 1961	S. C. 1958	Miss. 1957	Texas 1954	Fla. 1959	Okla. 1955
White oaks	6,595.5	4,296.3	6,034.3	2,799.6	2,982.1	5,572.2	3,798.5	1,410.9	2,897.9	3,362.4	862.9	574.2
Red oaks	1,211.6	4,509.8	5,746.4	5,098.4	4,393.9	2,788.1	4,031.5	2,554.4	1,376.7	1,178.5	1,685.7	445.4
Hickory	656.8	1,751.8	2,176.9	1,528.1	1,997.5	1,262.9	1,998.4	669.3	781.0	447.8	407.9	340.4
Maple	244.5	1,077.9	1,082.0	844.0	309.0	81.5	691.6	705.0	89.5	44.9	396.7	13.1
Sweet gum	4,068.4	3,211.5	1,531.9	2,543.5	2,407.4	2,232.6	627.6	2,624.7	1,934.8	1,750.7	667.1	78.5
Black gum	3,395.4	4,520.4	1,069.2	3,232.8	2,287.6	1,203.7	551.2	2,967.5	1,318.2	794.2	2,059.0	84.3
Yellow poplar	55.0	2,624.0	2,895.0	1,614.6	1,218.4	15.8	1,310.6	845.5	498.9	-	63.8	-
Ash	1,412.3	561.3	259.6	569.3	628.1	531.3	414.4	430.0	271.8	282.4	418.6	74.1
Pecan	2,157.8	-	-	-	-	391.5	-	-	354.7	188.3	-	-
Beech	565.7	233.2	616.4	134.5	391.2	99.7	419.9	99.5	241.5	152.7	25.1	-
Cottonwood	341.7	-	3.2	21.9	37.9	291.8	321.1	84.5	453.3	7.8	-	62.5
Elm	1,344.9	-	174.4	-	-	857.6	-	-	487.0	369.5	-	-
Walnut	-	53.6	-	17.1	22.6	-	218.0	16.1	-	-	-	3.1
Other hardwoods	3,050.9	1,699.5	1,414.6	1,225.9	1,619.5	1,565.5	1,570.2	734.8	1,303.8	537.8	1,053.1	347.8
Total	25,100.5	24,539.3	23,003.9	19,629.7	18,295.2	16,894.2	15,953.0	13,142.2	12,009.3	9,117.0	7,639.9	2,023.4

Sources: Forest survey releases, Southeastern Experiment Station and Southern Experiment Station, Forest Service, U. S. Department of Agriculture.

Map 1.) It appears from Map 1 that the counties with large hardwood volume
are clustered together in two areas -- the northeastern corner of the state
and the east-central region. These two areas provide a contrast in terms of
wood species, growth rate, and growth-cut relationship.

For purposes of discussion, Ellijay and Dublin have been selected as rep-
resentative of the two areas of hardwood concentration, and data have been com-
piled on hardwood timber resources within a 50-mile radius of each of these
two places. The Ellijay area is dominant in hard hardwood species, such as
oaks and hickory, while the Dublin area has more soft hardwood species, such
as gums, poplar, and maple. In terms of total hardwood standing volume, the
Ellijay area has a slight edge over the Dublin area, while in terms of growth-
cut relationship, the Dublin area has a clear advantage over the Ellijay area.
The annual net growth around Dublin exceeds cut by 22%, while the annual cut
of the Ellijay area exceeds annual net growth by 12%. The favorable growth-cut
relationship in the Dublin area can be explained partly by the faster growth
rate of soft-textured hardwoods, the warmer climate in the southern part of the
state, and the greater effort toward sound forest management exercised by sev-
eral large forest-oriented corporations in the area. The annual growth rate
in the Dublin area is about 9.563% of the standing timber volume as against
3.0133% in the Ellijay area. However, the Ellijay area has a smaller annual
cut volume together with a bigger saw-timber standing volume. The timber sta-
tistics for these two areas are presented in Table 8.

Table 8

HARDWOOD SAW-TIMBER VOLUME, ANNUAL GROWTH AND CUT
IN 50-MILE RADII OF ELLIJAY AND DUBLIN, GEORGIA, 1961
(in millions of board feet)

	Ellijay	Dublin
Soft hardwoods	575.6	1,919.0
Hard hardwoods	3,375.0	1,263.6
All hardwoods	3,951.6	3,282.6
Net annual growth	119.1	304.3
Annual cut	133.7	236.9
Growth-cut relationship	-14.6	+67.4

Sources: Forest survey releases for Georgia, North Carolina, and
          Tennessee, Southeastern Experiment Station and Southern
          Experiment Station, Forest Service, U. S. Department of
          Agriculture.

MAP 1

VOLUME OF HARDWOOD SAW TIMBER, BY GEORGIA COUNTY, 1961

MILLION BOARD FEET

☐	1 – 100
▦	101 – 200
▨	201 – 300
▩	301 UP

Industrial Development Division
Engineering Experiment Station
GEORGIA INSTITUTE OF TECHNOLOGY
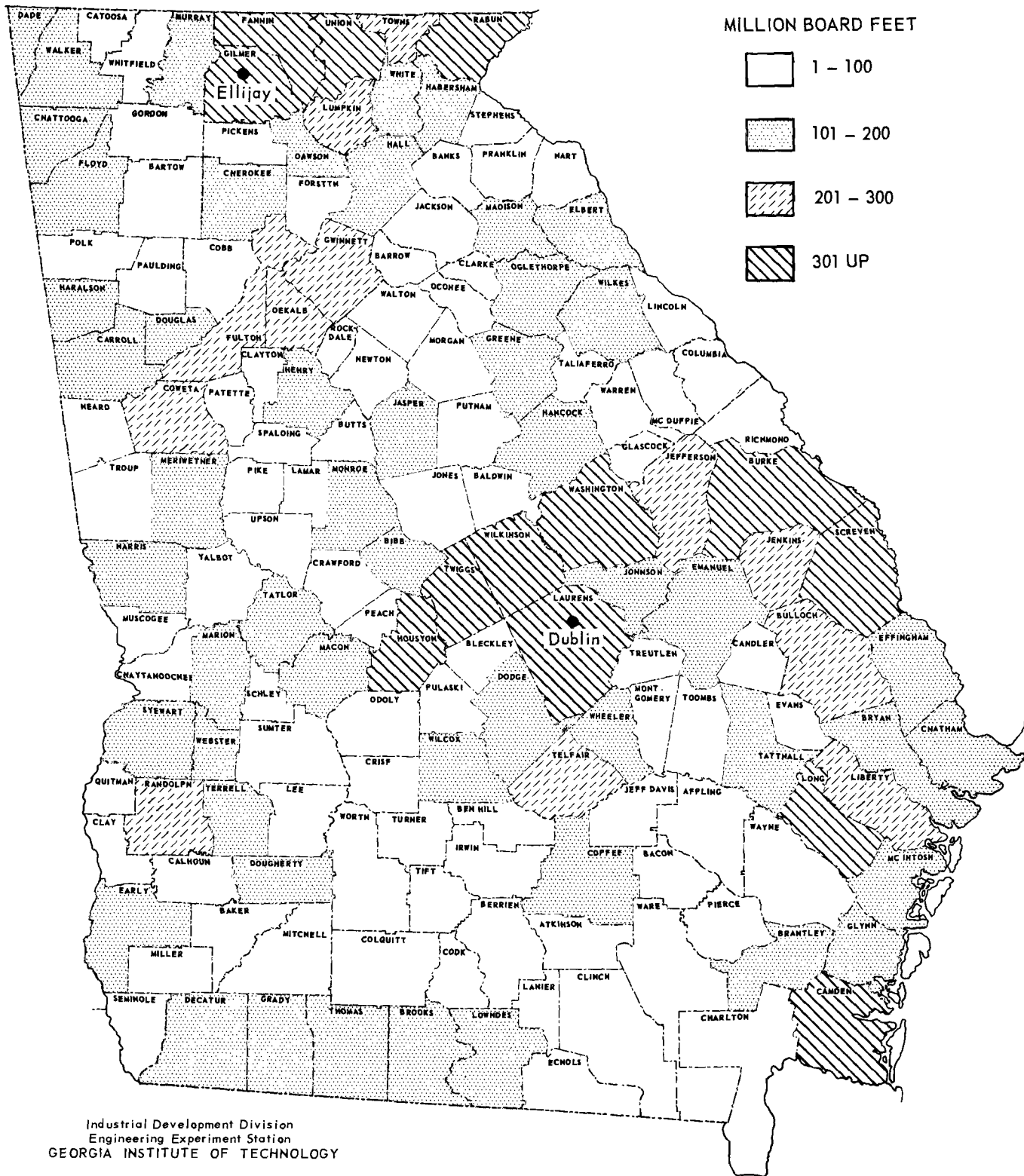
The Market for Hardwood Dimension Stock in Georgia

Two separate surveys were conducted in the period from August through November 1964 in order to determine the demand for and the supply of hardwood dimension stock in Georgia. Both the demand and the supply refer here to purchases and sales in the open market; they do not include captive consumption and captive operations.

The Demand. The annual demand for hardwood dimension parts in Georgia is estimated at between $4.5 million and $5.5 million in 1963-1964. A median of $5 million is used for calculating purposes. Of the state's total demand, about 70% was purchased from out-of-state suppliers and approximately 30% was purchased from Georgia suppliers.

The major uses for hardwood dimension parts in the state are given in Table 9. Nonupholstered wood furniture leads all uses, accounting for 66%. It is followed by cabinetmaking (11%), upholstered wood furniture (10%), store fixtures (5%), and miscellaneous (4%). Miscellaneous includes such diverse items as mobile homes, truck bodies, mattresses and springs, and textile equipment.

Two additional market potentials for dimension parts should not be overlooked. Two thirds of the firms which currently are purchasing the parts plan to increase their purchasing volume, while one half of the firms now making their own parts exclusively intend to purchase some parts in the future.

Table 9

MAJOR USES FOR HARDWOOD DIMENSION STOCK IN GEORGIA,
BASED ON SURVEY ESTIMATES, 1963-1964

Major Uses	Estimated Annual Demand	
Nonupholstered wood furniture	$3,300,000	66%
Wood cabinets	550,000	11
Upholstered wood furniture	500,000	10
Store fixtures	250,000	5
Miscellaneous	200,000	4
Unknown	200,000	4
Total	$5,000,000	100%

The various forms or stages of manufacture in which hardwood dimension stock is purchased by survey respondents are given below in order of importance:

Completely machined wood parts　　　　Carvings
Turnings　　　　　　　　　　　　　　　Moldings
Squares　　　　　　　　　　　　　　　Bendings
Semi-fabricated wood parts　　　　　　Clear panels and solid lumber cores
Upholstery frame parts　　　　　　　　Miscellaneous

The major states supplying hardwood dimension parts to Georgia, in order of importance, are:

North Carolina　　　　　　　　　　　Florida
South Carolina　　　　　　　　　　　Texas
Tennessee　　　　　　　　　　　　　Arkansas
Louisiana　　　　　　　　　　　　　New York
Kentucky　　　　　　　　　　　　　Michigan
Mississippi　　　　　　　　　　　　Illinois
Virginia　　　　　　　　　　　　　　Wisconsin
Alabama

Reasons most frequently given by the survey respondents for purchasing hardwood dimension stock from out-of-state suppliers are availability of supply, price, quality, wood species, and the dependability of supply.

Other information obtained through the survey dealt with timber resources and seasonal fluctuation in demand. About 75% of the respondents felt that Georgia has sufficient hardwood timber for the manufacture of dimension parts, although a few of them expressed the opinion that lumber would have to be imported from neighboring states. The majority of the respondents stated that the demand for hardwood dimension parts has no seasonal variation, although a few indicated some slackening during the summer season.

The Supply. There were about 11 producers of hardwood dimension parts in Georgia in 1964, excluding 40 to 50 lumber mills or other woodworking concerns which produced the parts infrequently as a side line, comprising an insignificant part of the total market. These 11 producers made $1,506,000 worth of the parts annually,[1] of which 43% was sold in Georgia and 57% was marketed in other states. Production of hardwood dimension parts in Georgia is far below the estimated demand of $5 million a year in the state.

1/ The two largest producers of hardwood dimension parts in Georgia were eliminated because they were captive operations.

The various forms of manufacture in which hardwood dimension stock is produced by the 11 Georgia producers are given below in order of importance:

Squares	Turnings
Completely machined wood parts	Moldings
Upholstery frame parts	Miscellaneous
Semi-fabricated wood parts	

The states or regions where Georgia producers ship hardwood dimension parts, in order of volume of shipments, are:

North Carolina	Ohio
Indiana	South Carolina
Pennsylvania	Europe
South Carolina	Alabama
Tennessee	Nebraska
Texas	Florida

Several Georgia producers indicated that a seasonal variation in supply exists, due mainly to adverse winter weather and rainy seasons. A few indicated that business was somewhat slower during the summer.

Of the 11 Georgia producers, six expect to expand their hardwood dimension parts production. Two other woodworking concerns in Georgia are keenly interested in establishing a hardwood dimension parts operation.

Market Penetration and Competition for Georgia-based Plants

According to an authoritative trade estimate, from 80% to 90% of hardwood dimension stock produced is shipped in interstate commerce. This estimate is confirmed by the finding of the demand survey that over 70% of the demand in Georgia is supplied by out-of-state sources. A potential Georgia hardwood dimension stock producer with an operation of economic size would have to look beyond the state boundary for markets even though the demand-supply ratio in Georgia is favorable.

Maps 2 and 3 show areas of concentration of supply and demand for hardwood dimension parts in the United States. Map 2 indicates the major furniture manufacturing centers in the eastern United States and numerous minor furniture manufacturing centers in Georgia and its neighboring states. There are about 15 major furniture manufacturing centers in the eastern part of the country, of which nine are in the North and six are in the South. Those manufacturing centers in the northern sphere are New York, New York; Gardner, Massachusetts; York, Pennsylvania; Jamestown, New York; Grand Rapids, Michigan; Sheboygan,

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Wisconsin; Chicago, Illinois; Evansville, Indiana; and Louisville, Kentucky.
The centers in the southern sphere are Martinsville, Virginia; High Point,
North Carolina; Hickory, North Carolina; Morristown, Tennessee; Fort Smith,
Arkansas; and Miami, Florida. This widespread distribution is a strong indica-
tion of the market or population orientation of the industry.

In contrast, major hardwood dimension stock producers are highly concen-
trated in the South where the hardwood timber resources are. There are about
50 major producers of hardwood dimension stock in the nation, extending from
the Gulf of Mexico to Tennessee, North Carolina, and Virginia. The distribu-
tion clearly follows the Mississippi River system and the mountain ranges in
the border areas. Due to the high concentration of large hardwood dimension
stock producers in the South, a substantial part of the stock bought by north-
ern furniture plants comes from the South.

A Georgia location for a major plant to produce hardwood dimension stock
would provide advantages both in marketing and in lumber supply. As indicated
by the surveys, the demand for hardwood dimension stock in Georgia greatly ex-
ceeds the supply in the state. This is probably true in Florida and South
Carolina, also, because there is only one major producer in each of these two
states. In addition, the largest wood furniture manufacturing center in the
United States, which covers the adjacent triangle area of Tennessee, North
Carolina, and Virginia, is within easy reach of north Georgia. Using Ellijay,
Georgia, as the center, a 300-mile radius includes six of the 15 major furni-
ture manufacturing centers in the East. (See Map 2.) The current market for
hardwood dimension stock in this 300-mile radius is estimated at $33,589,000 a
year. (See Table 10.) A mere 5% penetration of this market would amount to
sales of $1,679,000 a year. A 10% penetration would gross $3,359,000 annually,
an amount over 10 times the marketing volume of the largest existing hardwood
dimension stock producer in the state.

As indicated by the surveys, over one half of the hardwood dimension stock
producers in Georgia ship a substantial amount of their output to northern
states. In order to reach a wider market, a Georgia producer would have to
compete successfully with the major dimension stock producers surrounding the
state. Fortunately, the diversity of hardwood dimension products and the
proximity of many Georgia locations to the North Carolina-Tennessee-Virginia
border area would provide many opportunities to an efficient Georgia producer.

MAP 2

LOCATIONS OF MAJOR FURNITURE MANUFACTURING CENTERS IN
THE EAST AND MINOR FURNITURE MANUFACTURING CENTERS
IN THE SOUTHEAST, 1964

MINN

WISCONSIN

MICHIGAN

MAINE

VT NH

NEW YORK

GARDNER

MASS

CONN R

SHEBOYGAN

GRAND RAPIDS

JAMESTOWN

NEW YORK

IOWA

CHICAGO

PENNSYLVANIA

NJ

YORK

MD

DEL

ILLINOIS

INDIANA

OHIO

WEST
VIRGINIA

VIRGINIA

N

MISSOURI

LOUISVILLE

BEDFORD

EVANSVILLE

KENTUCKY

MARTINSVILLE

GALAX

LIVERMORE

HIGH POINT

JOHNSON CITY

LENOIR

NORTH
CAROLINA

MORRISTOWN

NASHVILLE

KNOXVILLE

HICKORY

FT. SMITH

MEMPHIS

TENNESSEE

CLEVELAND ATHENS

CHATTANOOGA

ARKANSAS

DALTON

ELLIJAY

SOUTH

TOCCOA

ROME

COLUMBIA

SUMTER

Industrial Development Division
Engineering Experiment Station
GEORGIA INSTITUTE OF TECHNOLOGY

MARIETTA

CAROLINA

BIRMINGHAM

ATLANTA

GEORGIA

MISSISSIPPI

MACON

CHARLESTON

ALABAMA

MONROE

MERIDIAN

MONTGOMERY

JACKSON

LOUISIANA

LAUREL

COLUMBIA

JACKSONVILLE

Major Manufacturing Center

ALEXANDRIA

Minor Manufacturing Center

NEW ORLEANS

FLORIDA

Circle Indicates 300-Mile Radius
of Ellijay, Georgia

TAMPA

ST. PETERSBURG

FT. LAUDERDALE

MIAMI

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MAP 3

LOCATIONS OF MAJOR HARDWOOD DIMENSION STOCK PRODUCERS IN THE UNITED STATES, 1964

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Each Dot Represents One Major Producer
Unless Indicated By Number

Table 10

ESTIMATED MARKET FOR HARDWOOD DIMENSION STOCK
WITHIN A 300-MILE RADIUS OF ELLIJAY, GEORGIA, 1964

State	Estimated Market	Estimated Per Cent of Market in the Radius	Estimated Market in the Radius
Alabama	$ 1,000,000	100	$ 1,000,000
Florida	2,673,000	5	134,000
Georgia	5,000,000	100	5,000,000
Kentucky	1,663,000	100	1,663,000
Mississippi	1,006,000	25	250,000
North Carolina	18,727,000	80	14,981,000
South Carolina	1,221,000	90	1,099,000
Tennessee	5,148,000	100	5,148,000
Virginia	8,629,000	50	4,314,000
Total			$33,589,000

For example, about 55% of the lumber used for furniture manufacture in North Carolina is imported from neighboring states. Georgia producers could ship a large quantity of hardwood dimension stock to North Carolina and other furniture manufacturing centers if a supply of good quality, sufficient variety, and competitive price could be developed.

Georgia producers should be on a par with or even in a better position than the major producers in the Gulf area for reaching the major furniture manufacturing centers in the East. Since Georgia has not a single major producer of hardwood dimension stock, the opportunity offered in this field is ripe for exploitation.

A Comparison of Freight Rates to Major Furniture Manufacturing Centers

Because of the low transportation cost relative to f.o.b. mill price, diversity of wood species used, variety of forms in which it is sold, and the lack of special handling requirements, hardwood dimension stock is an interstate commodity suitable for long-distance shipping. The following example illustrates the relatively low shipping cost of dimension stock. A trailer

load of completely machined hardwood dimension parts with an f.o.b. mill value of $7,500 recently was shipped from Kentucky to Miami. Transportation cost was $300, only 4% of the f.o.b. mill price.

Trailer (or truck) shipment generally is the major means of transportation for hardwood dimension stock because of its convenience and lower cost for short hauls. Railroad transportation is used only for distances of 800 miles or more.

Tables 11 and 12 present the respective truckload and carload freight rates for hardwood dimension stock in the United States. Two proposed Georgia locations (Ellijay and Dublin), together with eight other major supplying cities, are given as the starting points. The 15 major furniture manufacturing centers in the East, together with 10 other places, are used as the termination points. Rates are given in cents per hundred pounds for several carrier weight loads. It appears that motor rates are cheaper than rail rates for distances of less than 400 or 500 miles. If the costs of reloading and reshipping after a rail shipment reaches its destination are considered, truck transportation may be more economical for hauls of up to 700 or 800 miles.

The two Georgia locations have a decisive advantage over all competing locations in shipments to Georgia, Florida, and South Carolina. They have an advantage over the Gulf states in shipments to the North Carolina-Tennessee-Virginia area and to the New York-New England area, but they are undercut in shipments to the midwestern and the southwestern areas. Although plants in North Carolina, Tennessee, Virginia, and Kentucky enjoy lower rates than the two Georgia locations in shipments to their own area and to most furniture manufacturing centers in the North, the difference in rates is small, especially in the case of the north Georgia location.

Of the two Georgia locations, Ellijay is in a position to reach a larger market for hardwood dimension stock than Dublin. However, Dublin has a better supply of the hardwood species, such as poplar, gum, and maple, which are in the greatest demand in the furniture industry. Higher transportation costs can be absorbed by low material cost, efficient use of material and labor, or by finding profitable uses for wood waste. With well-managed production and marketing procedures, the two proposed Georgia locations have the potential for becoming major suppliers of hardwood dimension stock to the U. S. furniture industry.

Table 11

U. S. TRUCKLOAD FREIGHT RATES FOR HARDWOOD DIMENSION STOCK, FURNITURE PARTS, AND VEHICLE STOCK, 1964
(in cents per hundred pounds)

TO:	Ellijay Ga. 22M	Dublin Ga. 22M	Tuscaloosa Ala. 22M	Asheville N. C. 22M	Memphis Tenn. 22M	Nashville Tenn. 22M	Chattahoochee Fla. 22M	Little Rock Ark. 24M	Louisville Ky. 22M	Salem Va. 22M
Atlanta, Ga.	47	54	71	75	95	80	80	134	99	102
Macon, Ga.	60	38	80	83	104	90	70	153	108	105
Toccoa, Ga.	58	63	80	64	104	90	88	153	108	92
Sumter, S. C.	88	75	104	69	125	112	95	179	117	83
High Point, N. C.	83	92	110	50	130	112	112	185	112	60
Hickory, N. C.	71	88	104	39*	119	102	108	174	102	69
Lenoir, N. C.	71	88	104	39	119	102	108	174	102	69
Statesville, N. C.	75	90	105	42	123	105	108	176	105	64
Morristown, Tenn.	63	92	88	50	102	83	105	147	83	72
Johnson City, Tenn.	71	97	95	58	108	90	114	159	88	64
Chattanooga, Tenn.	58	80	69	72	83	61	95	113	83	92
Martinsville, Va.	90	99	117	71	134	117	119	188	110	24&
Bedford, Va.	97	110	117	83	130	112	128	186	113	19&
Columbia, Miss.	112	112	78	128	80	104	97	100	121	144
Miami, Fla.	134	110	137	137	157	152	117	217	166	150
Fort Smith, Ark.	168#	182#	123#	182#	92#	128#	179#	69	159#	159#
Louisville, Ky.	92	114	99	92	90	65	123	124	-	111
Evansville, Ind.	97	114	95	105	80	61	121	112	60	124
Chicago, Ill.	154	176	151	154	117	105	185	159**	77&	131&
Sheboygan, Wisc.	223#	252#	227#	227#	180#	146#	260#	173	104	149#
Grand Rapids, Mich.	282#	311#	278#	285#	252#	249#	318#	260	188	228#
York, Pa.	154#	168#	179#	138#	190#	170#	184#	224*	127*	98&
New York, N. Y.	174#	182#	196#	157#	210#	190#	201#	224*	151*	121&
Jamestown, N. Y.	170#	193#	184#	162#	176#	154#	207#	207*	112*	138&
Gardner, Mass.	199#	207#	241#	182#	251#	204#	254#	258*	160*	151&

22M - 22,000 pounds, except as noted. ** - 22,000 pounds.
24M - 24,000 pounds, except as noted. # - 24,000 pounds.
* - 20,000 pounds & - 30,000 pounds.

Table 12

U. S. CARLOAD FREIGHT RATES FOR HARDWOOD DIMENSION STOCK, FURNITURE PARTS, AND VEHICLE STOCK, 1964
(in cents per hundred pounds)

	Ellijay Ga.		Dublin Ga.		Tuscaloosa Ala.		Asheville N. C.		Memphis Tenn.		Nashville Tenn.		Chattahoochee Fla.		Little Rock Ark.	Louisville Ky.		Salem Va.	
TO:	22M	EXC	22M	EXC	22M	EXC	22M	EXC	22M	EXC	22M	EXC	22M	EXC	30M	22M	EXC	22M	EXC
Atlanta, Ga.	53	40	60	45	72	54	76	57	95	71	81	60	81	60	120	99	74	102	76
Macon, Ga.	67	50	42	32	81	60	83	62	104	78	90	68	70	53	130	109	81	106	79
Toccoa, Ga.	64	48	70	53	81	60	64	48	104	78	90	68	88	66	130	109	81	93	70
Sumter, S. C.	88	66	76	57	104	78	69	52	126	94	112	84	95	71	151	117	88	83	62
High Point, N. C.	83	62	93	70	110	83	64	48	131	98	112	84	112	84	156	112	84	60	45
Hickory, N. C.	72	54	88	66	104	78	49	36	119	89	102	76	109	81	147	102	76	69	52
Lenoir, N. C.	72	54	88	66	104	78	49	36	119	89	102	76	109	81	147	102	76	69	52
Statesville, N. C.	76	57	90	68	106	79	55	41	124	93	106	79	109	81	149	106	79	64	48
Morristown, Tenn.	63	48	93	70	88	66	50	38	102	76	83	62	106	79	125	83	62	73	55
Johnson City, Tenn.	72	54	97	73	95	71	58	44	109	81	90	68	115	86	134	88	66	64	48
Chattanooga, Tenn.	58	44	81	60	69	52	73	55	83	62	61	46	95	71	108	83	62	93	70
Martinsville, Va.	90	68	99	74	117	88	72	54	135	101	117	88	119	89	159	110	83	45	34
Bedford, Va.	97	73	110	83	117	88	83	62	131	98	112	84	128	96	157	115&	-	42	-
Columbia, Miss.	112	84	112	84	78	59	128	96	81	60	104	78	97	73	96	122	91	144	108
Miami, Fla.	135	101	110	83	137	103	137	103	157	118	153	114	106	79	183	167	125	150	113
Fort Smith, Ark.	142&	-	154&	-	115&	-	154&	-	88&		118&	-	151&	-	69	134&	-	134&	-
Louisville, Ky.	93	70	115	84	99	74	93	70	90	68	66	49	124	93	115	-	-	113	-
Evansville, Ind.	97	73	115	86	95	71	106	79	81	60	61	46	122	91	101	60&	-	127	-
Chicago, Ill.	137	103	156	117	134	101	137	103	115	86	106	79	163	123	128	88&	-	134&	-
Sheboygan, Wisc.	151&	-	171&	-	154&	-	154&	-	134&	-	123&	-	176&	-	142	106&	-	151&	-
Grand Rapids, Mich.	191&	-	210&	-	188&	-	193&	-	171&	-	169&	-	215&	-	177	154&	-	191&	-
York, Pa.	137	103	149	112	159	119	123	92	169	127	151	113	163	123	182	130&	-	88&	-
New York, N. Y.	154	116	161	121	173	130	140	105	186	139	169	127	178	134	201	154&	-	108&	-
Jamestown, N. Y.	151	113	171	128	163	123	144	108	156	117	137	103	183	137	167	115&	-	123&	-
Gardner, Mass.	176	132	183	137	196	147	161	121	198	148	181	136	200	150	208	163&	-	134&	-

22M - 22,000 pounds, except as noted.

30M - 30,000 pounds.

& - 30,000 pounds.

EXC - Applicable rate on the excess over 22,000 pounds loaded in the same car with the first 22,000 pounds.

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ECONOMICS OF HARDWOOD DIMENSION STOCK MANUFACTURE

An Operation of Economic Size

Georgia has 11 firms manufacturing hardwood dimension stock, but only five medium-sized producers. None of them has annual sales of over $300,000 a year. The emphasis here is on a model plant with a versatile supply of hardwood dimension stock which would be in a position to compete successfully with the major plants in neighboring states.

The nature of the hardwood dimension business and the advantages of an operation of economic size are described below:

> Woodworking, at its best, is a difficult business but the dimension manufacturer assumes one of the biggest problems, the conversion of raw lumber into usable pieces of wood. He is not only competing with other mills but, in many cases, with his own customers. He has as many scheduling and quality problems as he has customers and he must get out the cuttings as well as or better than each of them can do individually. He must have good equipment and a reasonably local supply of raw material. He has got to know his costs on each item he makes; he cannot average them as is done by many furniture companies. He must keep his orders in balance so as to get the best yield from the lumber he cuts. His production must be flexible as he is committed to his customer's needs. He is forced to carry a large inventory of lumber if he is to give good service.

> Obviously, I am referring now to the large, diversified mill. The smaller the operation and the more specialized, the lesser the problems, but being big has several very decided advantages. There is very little risk of being seasonal. He represents a better market for local lumber and can often buy more economically. With his versatility, he can pick his customers to fit his production, working not only for maximum yield but maximum value. The investment is high but the diversified mill best serves the needs of the furniture industry.[1]/

According to the interviews and surveys made for this study, most of the medium-sized producers of hardwood dimension stock in the state have a prosperous or a steady business, whereas a number of small producers have problems ranging from high costs in price to difficulty in obtaining hardwood lumber.

1/ Richard C. Anderson, "The Hardwood Dimension Business," Proceedings of the Conference on "Forest Industry Opportunities in Rural Development," Harrisburg, Pennsylvania, November 21-22, 1960, U. S. Department of Agriculture, Forest Service, p. 20.

Estimated Fixed Investment

Fixed investment costs are estimated for a minimum operation of economic size. The estimate is based on a hardwood dimension plant output capacity of 15,000 board feet per day on a one-shift basis. The fixed investment costs are given for land and building, auxiliary facilities, and machinery for semi-finished and completely finished dimension parts.

A. Land and Building

Land, 10 acres at $200.00 per acre	$ 2,000.00
Land preparation and foundation	5,000.00
Two buildings with a total of 25,000 sq. ft. @ $3.75 per sq. ft.	93,750.00
Power wiring	10,000.00
Total	$110,750.00

B. Auxiliary Facilities

Blowpipe system	$ 15,000.00
Dry kiln, steam-operated to hold 40,000 to 45,000 board feet of hardwood lumber, including all necessary accessories, kiln trucks, prefab building, 150 HP boiler, etc.	39,000.00
Frog-lift truck with 15,000 lbs. capacity	15,000.00
Automatic unstacker with hoist, stick belts, haul-up chains, etc.	10,500.00
Wood hogs, with motor, etc.	5,500.00
Pallets, approximately 50 @ $10.00	500.00
Lift jacks, hydraulic (for pallets), 3 @ $250.00	750.00
Total	$ 86,250.00

C. Machinery for Semi-Finished Dimension Parts

Item	Quantity	Unit Price	Total Price
Gravity rollers	3	-	$ 1,690.00
Transfer carriages	2	$ 1,350.00	2,700.00
Hydraulic scissor lifts	2	3,425.00	6,850.00
Infeed saw tables	2	330.00	660.00
Hydracut saws	2	2,150.00	4,300.00
Crossfeed conveyors	2	1,504.00	3,008.00
Belt conveyor	1	1,570.00	1,570.00
Rip saw	1	2,520.00	2,520.00
Surfaplane	1	16,000.00	16,000.00
Belt conveyor	1	1,490.00	1,490.00
Dispatch conveyor	1	1,442.00	1,442.00
Accumulating conveyors	3	1,190.00	3,570.00
Scrap block conveyors	2	-	1,748.00
Scrap edging conveyor	1	725.00	725.00
Rip saw	4	5,075.00	20,300.00
			$68,573.00
Freight, approximate			1,500.00
Engineering service and installation			2,600.00
Total			$72,673.00

Detailed specifications for each machine and a plant layout are given in Appendix 1 and Appendix 2, respectively.

D. Machinery for Completely Finished Dimension Parts

Item	Quantity	Unit Price	Total Price
Panel flow edge gluer, 88" length, complete with automatic glue spreader	1	$21,250.00	$ 21,250.00
Double surfacer, 36" capacity	1	19,400.00	19,400.00
Wide belt sander, 38" capacity, top belt	1	12,347.00	12,347.00
Double end tenoner	1	16,620.00	16,620.00
Automatic turning lathes	2	7,500.00	15,000.00
Automatic turning sander	1	9,750.00	9,750.00
Gang rip saw	1	5,800.00	5,800.00
Bending press with steam retorts	1	6,500.00	6,500.00
24-spindle carver	1	12,500.00	12,500.00
8" molder	1	16,000.00	16,000.00
Automatic molder return	1	1,500.00	1,500.00
Double end trimming, sawing and boring machine	1	14,500.00	14,500.00
Boring machine, combination horizontal and vertical	1	16,000.00	16,000.00
Automatic shaper	1	5,500.00	5,500.00
Router	1	3,000.00	3,000.00
			$175,667.00
Freight, approximate			2,500,00
Total			$178,167.00

Note: A floor layout can be provided upon request.

Because of the wide range of choice in regard to wood species, degree of finishing, and type of end product, no attempt is made here to estimate the production costs and possible returns for the model plant. However, labor and lumber requirements would be approximately as follows: The plant would require about two laborers for taking care of the dry kiln and wood yard, 11 direct laborers for the semi-finished part operation, 21 direct laborers for the completely finished part operation, and three for packaging and shipping, as well as a mechanic for maintenance and a plant superintendent. Daily intake of air-dry hardwood lumber may range from 18,000 board feet to 30,000 board feet, depending upon wood species and the grade of lumber.

APPENDICES

Appendix 1

DETAILED SPECIFICATIONS FOR MACHINERY USED
IN A PLANT MAKING SEMI-FINISHED HARDWOOD DIMENSION PARTS

Item No.	Quantity	Description
1	3	Porter Special Gravity Roller Sections 24" O.A.C. x 19'6" long. Frame of formed and welded steel construction. All ball bearing mounted rollers on 4" centers. 12-1/2" roller height.

Price: $1,690.00

2	2	Porter Special Air Operated Transfer Carriage each 48" wide x 18' long. Frame of formed and welded steel construction. Carriage air operated for raise and lower in transfer operation. Raised height 1/2" rolls height above detail 1. Total travel 1" carriage capacity 8,000 lbs., 13" raised height.

Price: $1,350.00 each

3	2	Conveyorized Hydraulic Scissors Lifts 8,000 lbs. capacity. Platform size 48" wide x 16' long. Frame of formed and welded steel construction. All rollers ball bearing mounted on 4" centers. Complete with self contained 3/4 H.P. pump motor and operator foot switch. 220/440 volt, 60 cycle, 3 phase electrical operation. 36" vertical travel, collapsed height 13".

Price: $3,425.00 each

4 & 5	2	Porter #800 Infeed Saw Tables 1 (R.H.) 1 (L.H.). Frame of formed and welded steel construction. Equipped with full length back fence formed legs with adjustable inserts. Ball bearing mounted rollers.

Price: $330.00 each

6 & 7	2	Porter #43-20J1 Hydracut Saws 1 (R.H.) 1 (L.H.). Equipped with 7-1/2 HP 3600 RPM precision motor on arbor saw motor. Arranged for 220/440 volt, 60 cycle, 3 phase electrical operation with magnetic starter and line control voltage. Saw carriage hydraulically fed and variable from 0-45 12" strokes per minute. Maximum stroke 20". Two variable stroke length, manually selected. Blade guard will accommodate up to 20" dia. blade. 1-1/8" diameter arbor adjustable from 39" -- 43" above floor. 3/4 HP Pump Motor.

Price: $2,150.00 each

Item No.	Quantity	Description

8 & 9 **2** Porter #800-B Crossfeed Conveyors 6'6" x 60". Frame of formed and welded steel construction. Equipped with hydraulically operated drop roll carriage for operation with #43-J1 Saw; 6'6" graduated gauge bar with four cutter stops furnished. Power unit basic 1/2 HP 1800 RPM motor variable speed. Belt speed 211-597 FPM. Top quality ball bearings and top quality belting used throughout.

Price: $1,504.00 each

10 **1** Porter #805 Belt Conveyor 24" wide x 30' long. Frame of formed and welded steel construction. Powered from 3/4 HP 1800 RPM motor. Variable speed 2.75 to 1 standard. Equipped with formed steel legs with adjustable inserts. 12" dia. rubber lagged drive rolls. All rolls ball bearing mounted. Top quality 28 oz. duck rubber covered belting used.

Price: $1,570.00 each

11 **1** Porter #810 Ripsaw Tailboy 60" x 72". Standard unit to handle stock up to 6'6" in length. Equipped with short stock feeder unit for stock less than 18". Frame of formed and welded steel construction. Equipped with formed steel legs with adjustable inserts. Drop roll carriage air, manually operated via air valve and 2" air cylinder. Equipped with filter, oiler and regulator. Power unit 1/2 HP, 1800 RPM motor variable speed. Short stock feeder powered via 1/4 HP ratio motor. Top quality 28 oz. duck rubber covered belting used. Top quality ball bearings throughout.

Price: $2,520.00

12 **1** Porter #460-18" Surfaplane. Equipped with 20 HP upper cylinder motor and 10 HP lower cylinder motor 5-1/2" dia. 4 knife belt driven cylinder at 5100 RPM. Feed speed variable 45-120 FPM. Width of cut 18", 20" vertical adjustment on feed. 1 HP elevation motor, 3 HP feed motor. Equipped with friction plate clutch protection on feed works. Infeed and outfeed tables grooved and ground. Equipped with model #70 motor driven knife grinder 220/440 volt, 60 cycle 3 phase electrical operation.

Price: $16,000.00

13 **1** Porter Transfer Belt Conveyor 60" wide x 13' long. Frame of formed and welded steel construction. See detail 10 structural specification.

Price: $1,490.00

Item No.	Quantity	Description

14   **1**

Porter (2) Trough Dispatch Conveyor. 3" wide troughs x 15'6" x 30'6" long with (3) slides. Frame of formed and welded steel construction of rigid design. All belts 28 oz. 3 ply duck rubber covered. Top quality ball bearings throughout. Equipped with variable speed power unit with magnetic starter and 1 P.B. Control.

Price: $1,442.00

15   **3**

Porter Accumulating Belt Conveyors 60" wide x 48" long. Frame of formed and welded steel construction. Fixed speed gearhead drive motor with magnetic motor starter and foot-switch. Rubber covered 3 ply 28 oz. duck rubber covered belting used. Top quality ball bearings used throughout. Formed steel legs with adjustable inserts.

Price: $1,190.00 each

16   **2**

Porter #806 Scrap Block Conveyors. 1st unit 12' wide x 16' long. Frame of formed and welded steel construction. Floor mounted. 1/2 HP 1800 RPM motor for 220/440 volt, 60 cycle 3 phase electrical operation.
Second unit 12" wide x 17'6" long, floor mounted, inclined to feed detail 17 at 6'6" belt height. Frame and power to previous specifications. Top quality 28 oz. duck rubber covered belting and top quality ball bearings used throughout.

Price: $1,748.00

17   **1**

Porter #806 Scrap Edging Conveyor 12" wide x required length. Ceiling mounted. Belt height 6'6". Frame of formed and welded steel construction. 1 HP 1800 motor for 220/440 volt, 60 cycle, 3 phase electrical operation. Top quality 28 oz. 3 ply duck rubber covered belting and top quality ball bearings used throughout.

Price: 1st 10' $725.00
Additional $22.00 per foot

Item No. Quantity   Description

11A &   1   Diehl SL 50 Straight Line Rip Saw, complete with the follow-
15A   3   ing standard equipment: 2 HP dual-voltage variable speed
                     feed motor, standard feed rates 60 - 180 FPM. Linear speed
                     rate indicator. One (1) set of anti-kickback fingers.
                     Floating type ball bearing rip gauge. Full ball bearing,
                     with arbor mounted in precision ball bearings. Safety micro-
                     switch on saw pit door. Pressure lubrication on chain and
                     race. Start-Stop push buttons for arbor motor and feed motor.
                     110 volt, 60 cycle, single phase control circuit. Full over-
                     load and under-voltage protection. Set of wrenches, parts
                     list and operating instructions.

	Price:	$4,685.00
15 HP motor		390.00
Price, f.o.b. Wabash, Indiana		$5,075.00
SL 50 Left-Hand Machine, same as above		$4,935.00

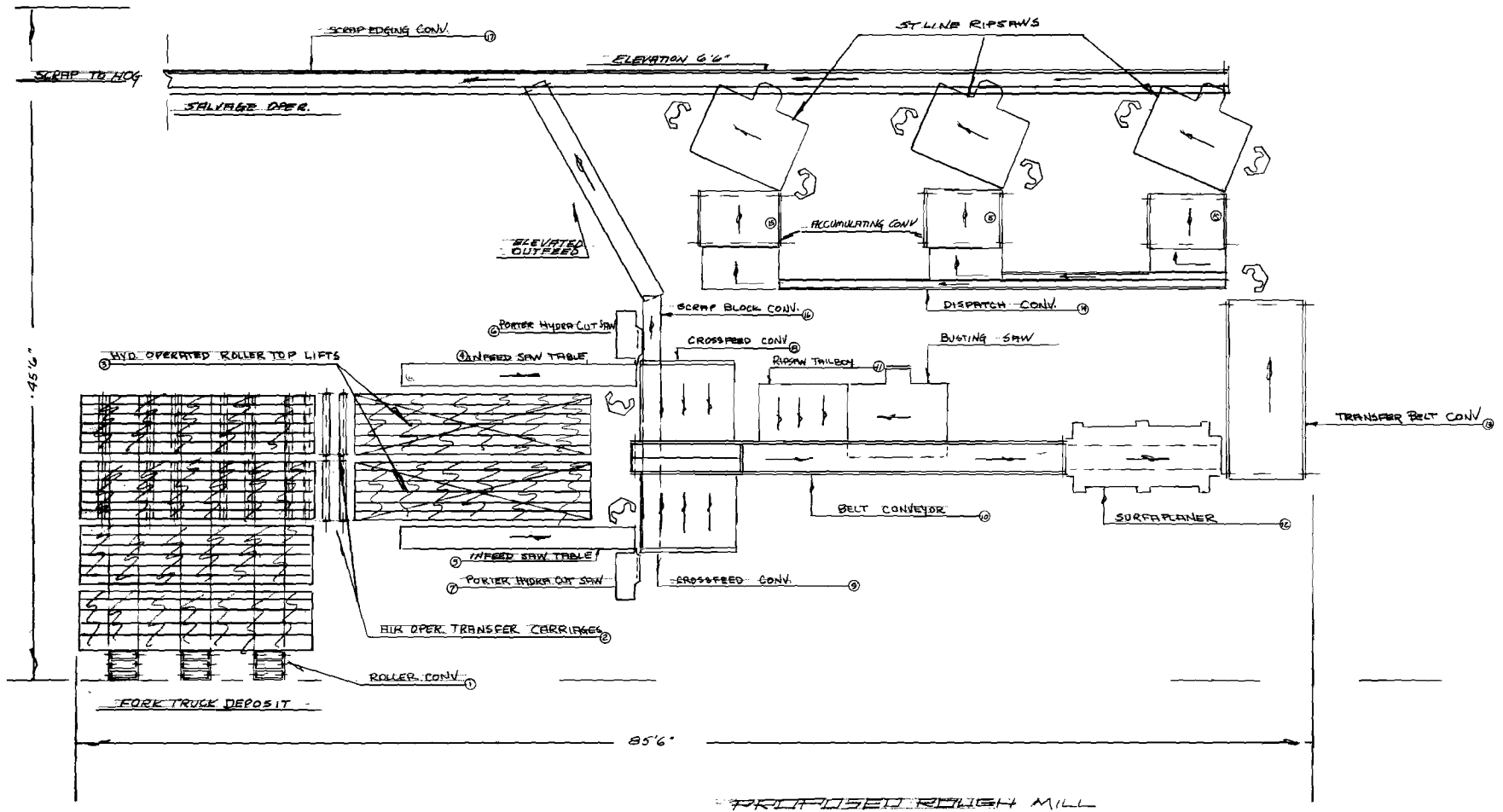### OPTIONAL EQUIPMENT WHEN ORDERED WITH BASIC DIEHL RIP SAW MACHINE

10 HP Arbor Motor	$375.00
15 HP Arbor Motor	390.00
20 HP Arbor Motor	480.00
Sliver Stopper Assembly	100.00
Disappearing Rip Gauge	100.00
Disappearing Rip Gauge (Foot Treadle)	125.00
Stock Guide Shifter Lever	30.00
Rubber Inserts on Feed Chain	125.00
Rubber Covered Pressure Rolls	200.00
Automatic Panel Lay-Up Gauge and Table	850.00
Export Boxing	215.00
Canadian Wiring	25.00

Domestic Weight: 4,250 Pounds

Note: "Item No." refers to the number identifying each item of equipment on
the accompanying layout chart in Appendix 2.

A FLOOR PLAN LAYOUT FOR A PLANT MAKING SEMI-FINISHED HARDWOOD DIMENSION PARTS WITH A DAILY OUTPUT CAPACITY OF 15,000 BOARD FEET

SCRAP EDGING CONV. ⑰

ST. LINE RIPSAWS

ELEVATION 6'6"

SCRAP TO HOG

SALVAGE OPER.

ELEVATED OUTFEED

ACCUMULATING CONV

SCRAP BLOCK CONV. ⑯

DISPATCH CONV. ⑭

⑥ PORTER HYDRA CUT SAW

CROSSFEED CONV ⑧

BUSTING SAW

④ INFEED SAW TABLE

RIPSAW TAILBOX ⑪

③ HYD. OPERATED ROLLER TOP LIFTS

TRANSFER BELT CONV ⑬

BELT CONVEYOR ⑩

SURFAPLANER ⑫

⑤ INFEED SAW TABLE

⑦ PORTER HYDRA CUT SAW

CROSSFEED CONV. ⑨

AIR OPER. TRANSFER CARRIAGES ②

ROLLER CONV ①

FORK TRUCK DEPOSIT

85'6"

PROPOSED ROUGH MILL

STOCK LENGTH RAW 16'0" CUT MAX 6'6" MIN 12"
THICKNESS 4Q & 8Q WIDTH RANDOM
KILN DRIED HARDWOOD DIMENSION EST. PROD 15,000 BD. FT

-39-

45'0"