United States
Department of
Agriculture

Forest Service

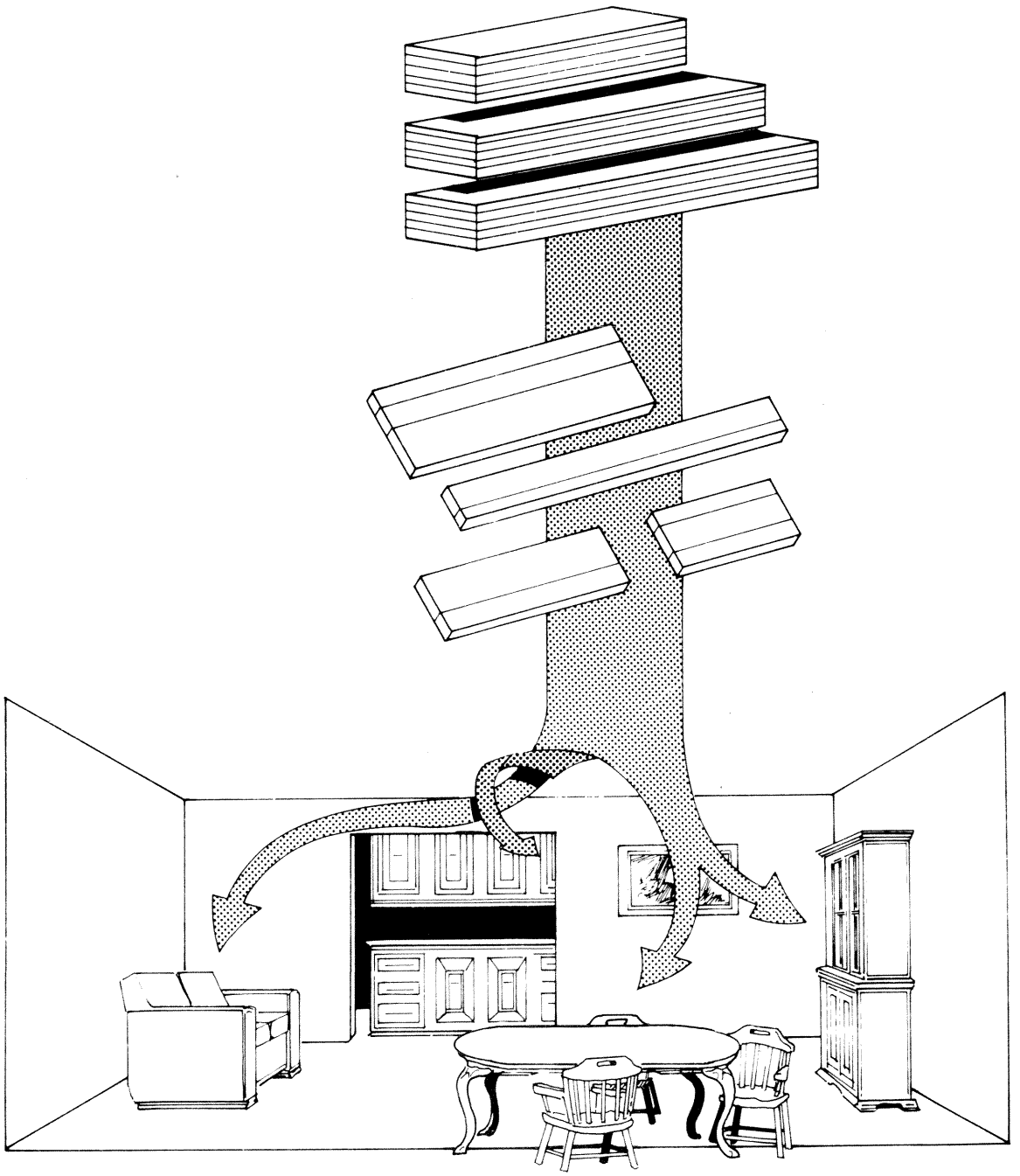
**Northeastern Forest
Experiment Station**

Research
Paper NE-521

1983

BLANKS: A Computer Program for Analyzing Furniture Rough-Part Needs in Standard-Size Blanks

Philip A. Araman



The Author

Philip A. Araman received a B.S. degree in wood science and technology from North Carolina State University in 1968, and a M.S. degree in forest products from Virginia Polytechnic Institute and State University in 1975. A research forest products technologist at the Northeastern Forest Experiment Station's Forestry Sciences Laboratory at Princeton, West Virginia, he is currently engaged in research on utilization of low-grade hardwoods.

Manuscript received for publication 18 October 1982

Abstract

A computer program is described that allows a company to determine the number of edge-glued, standard-size blanks required to satisfy its rough-part needs for a given production period. Yield and cost information also is determined by the program. A list of the program inputs, outputs, and uses of outputs is described, and an example analysis with sample output is included.

Introduction

Standard-size, edge-glued blanks as input to the furniture manufacturing process is a new concept (Fig. 1). The concept calls for the use of a few standard sizes of ready-to-use, wide edge-glued blanks to produce the thousands of different parts required by a company (Araman et al. 1982). Before a company will adopt the use of blanks, it must be convinced of the merits of standard-size blanks.

A key question is: how well and at what cost do blanks meet the actual needs of my company? To provide the answer quickly through uniform individual analysis, we developed a computer program called BLANKS. The program determines the number of edge-glued, standard-size blanks required for each species-thickness-quality combination of rough parts specified by a company. The results from program BLANKS provide information on the number of standard-size blanks needed, yields, and costs, and describe a company's overall solid wood needs for a given production period.

In this report we present:

- A description of program BLANKS.
- The required program inputs.
- The program outputs.
- The uses of program outputs.
- An example analysis.

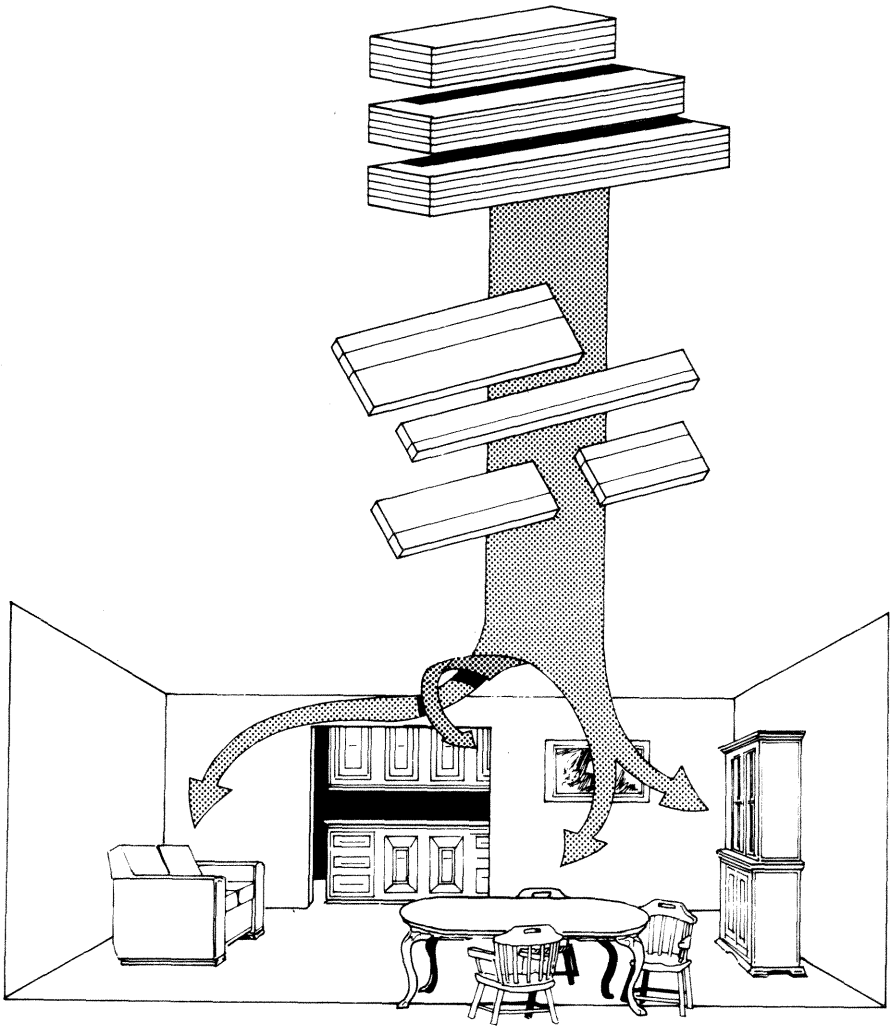


Figure 1.—In the standard blank concept, standard-size blanks are processed to rough-dimension parts that are used to make furniture and cabinets.

Program Description

Program BLANKS (see Appendix), written in FORTRAN, makes a separate analysis of the number of edge-glued standard-size blanks needed for each species-thickness-quality combination of parts required by a manufacturer. Part needs can be for a piece of furniture, any number of pieces in a suite or group of furniture, or for any combination of pieces of furniture.

In each analysis, the program:

- Simulates producing rough parts for one blank length at a time.
- Within a blank length, simulates producing parts starting with the widest part first, using 1/8-inch kerf saws. If needed, narrow parts are ripped from left over edgings. After the widest width cuttings are obtained, the next widest parts are processed. This is continued until all needs are satisfied.
- Tallies all pieces 1 inch and wider left over from the blanks. This material can be recycled into new blanks.
- Calculates yield, regluable material, end-trim waste, edge and kerf waste, and total waste, in percentages, for each blank size. It also provides totals for each species-thickness-quality combination.
- Calculates dollar values for the parts produced and for the regluable materials. Values are based on square foot on input in standard-size blanks.

Results are printed by program BLANKS after all parts are satisfied. A summary table shows what is needed by standard blank size and in total, including number of blanks needed, yields, and costs.

Program Inputs

The input data required include standard blank sizes (from Table 1) and their value per square foot, along with the rough-part lengths, widths, and quantities needed. Quantities needed are determined by multiplying the number of parts needed for the item times the number of items needed for the production period. The following steps must be taken to prepare the input data for program BLANKS.

1. For each different part size needed, prepare a part size data card with the following information:

Item	*Columns*	
Part length	4-9	Right justify or include decimal point
Part width	11-16	
Quantity neded	17-20	Must right justify
Group number Input lumber thickness Species needed Quality	21-72	Choose your own format (This information is not used by the computer program but is needed to arrange the data cards in the next step, which must be done manually.)

2. Arrange part-size data cards by lumber species-thickness-quality.

3. Sort the part-size data cards within each species-thickness-quality by standard lengths. For example, all 4/4 clear parts up to 15 inches long would go into the 15-inch group, all parts over 15 inches and up to 18 inches long would go into the 18-inch group, and so on.

4. Arrange the part-size data cards within each standard length group by part width—widest to narrowest.

5. For each standard-size blank prepare a data card with the following information:

Item	*Columns*	
Blank length	7-12	
Blank width	13-18	
Blank value/square foot	19-24	(estimate of internal production value or outside purchase price)

Table 1.—Recommended hardwood blank standard sizes for furniture and cabinet manufacturers (in inches)

Nominal thickness	Intended product finish thickness	Actual blank thickness	Blank lengths												
			Clear Quality/26-Inch-Wide Blanks												
5/8	3/8	1/2	13	15	17	18	22	26	31	36	42	—	—	—	—
3/4	1/2	5/8	14	17	19	22	25	29	31	35	41	47	58	86	—
4/4	3/4	7/8	15	18	21	25	29	33	38	45	50	60	75	100	—
1-1/4	1	1-1/8	15	18	21	25	29	33	38	45	50	60	75	100	—
1-1/2	1-1/4	1-3/8	15	18	21	25	28	32	35	40	45	50	60	70	85
2	1-5/8	1-3/4	15	18	21	25	28	32	35	40	45	50	60	70	90
			Core Quality/26-Inch-Wide Blanks												
1	3/4	7/8	15	18	21	23	26	29	34	40	50	60	70	95	—
1-1/4	1	1-1/8	15	18	21	23	26	29	34	40	50	60	70	85	—
			Sound Frame Quality (for upholsterd frames)/20-Inch-Wide Blanks												
1	3/4	7/8	13	17	19	22	24	27	29	33	44	54	70	80	100
1-1/4	1	1-1/8	15	18	20	23	25	28	33	45	55	65	80	90	100
1-1/2	1-1/4	1-3/8	14	18	21	24	28	31	34	40	—	—	—	—	—
2	1-5/8	1-3/4	12	16	19	21	24	28	30	34	—	—	—	—	—
			Sound Interior Quality (for case goods)/20-Inch-Wide Blanks												
1	3/4	7/8	15	18	21	25	29	34	40	50	60	70	95	—	—

Blank sizes other than the recommended sizes in Table 1 can be used here.

6. Arrange the input data in the following sequence for each species-thickness-quality analysis:

a. First standard-size blank data card.

b. A card stating in columns 1-2 (right justified) the number of part cards that will follow for this standard size.

c. The part cards.

d. A continuation or stop card—if column 1 contains a 1, the program will continue; if it contains a 2, the program will stop and provide a summary printout.

e. Continued sets of cards a, b, c, and d until all standard length sets have been placed in the card deck. Make sure that card d has a 2 in column 1 in the last set of cards.

Program Outputs

After the simulator has produced all of the required parts from blanks, summaries are calculated and the results are printed. Included in the printout for each blank size (L x W) are: number needed, square feet of blanks used, square feet of parts produced, percent yield of parts, total cost of the parts, percent regluable material, regluable material value, percent end-trim waste, percent edge and ripping waste, and percent total waste. Totals for each species-thickness-quality combination also are provided.

Uses of Output

The blanks-to-parts results generated by program BLANKS can be used by a manufacturer in many ways. The information allows a manufacturer to take a good look at what is needed in rough dimension or, more specifically:

- Evaluate standard-size blanks as a solid wood input material.
- Consider and develop a blanks inventory system.
- Decide what to make or buy and inventory as standard-size blanks.
- Decide what to make or buy in exact rough-part dimensions if total adoption of the standard sizes is not desired.

- Decide which low-demand species-thickness parts should be made with a more highly demanded species-thickness.

Program BLANKS also can be used to determine improvements in blanks-to-parts yield when the rough-part lengths are shortened, so shorter standard blank lengths can be used. The blanks should be manufactured precisely so that rough-to-finish part end-trim allowances can be reduced.

The program could be used in the planning stages for new furniture groups. The groups could be designed with the standard sizes and then analyzed by program BLANKS on the basis of cost and yield before production. In these stages, the program might be used to test for improved yields and reduced costs due to slight design changes.

Example Analysis

We used program BLANKS to analyze the 90-day needs for a manufacturer of occasional tables and other living room furniture. The manufacturer wanted to know if the use of standard blanks would be beneficial, specifically, he wanted to know how many blank sizes he would have to use and what his yields would be. He also wanted to get an idea of the inventories of blanks that would have to be maintained, and, among other things, determine the reduction in conversion losses if his product engineers modified slightly (no more than 1/2 inch) some part-length requirements. Lastly, he wanted to get a better idea of his overall part requirements.

This manufacturer produced furniture for 14 different suites or groups (A-N) during the selected 90-day production period. Over 261 different designs, mostly tables, had to be made. A total of 39,800 pieces of furniture were made during the 90-day production period. To make this furniture, six species and 25 species-thickness-quality combinations were required.

After preparing the input data cards, we ran each species-thickness-quality combination requirement by suite of furniture. Program BLANKS was used to analyze 102 sets of requirements. One of the summary output listings provided to the manufacturer is shown in Table 2.

After all of the runs were completed, we summarized the blank requirements for each species-thickness-quality combination. Table 3 shows the results for the 4/4 cherry clear-quality blank needs. The totals tell the company what its 90-day needs would be.

So that the manufacturer could see the improvements possible if his rough-part lengths could be reduced, we ran additional simulations with adjusted data. We reviewed the Group B 4/4 cherry requirements, where the part length was 1/2 inch or less longer than the standard length, we reduced the part length to the standard length and reran BLANKS. Table 2 presents the original results and Table 4 the adjusted results.

The changes gave us better conversion utilization, lower costs, and more demand for shorter blank lengths. The increased demand for shorter blanks and a decreased need for longer blanks caused the total surface area to go down and the yield to go up. The total cost went down along with the waste. Material that could be reglued into panels (last ripping cuts over 1 inch wide) increased. End-trim waste dropped from 5 to 3 percent.

After analyzing these results, the manufacturer was convinced of the merits of the blanks concept and has developed for implementation a completely new rough-mill processing and inventory system. When implemented, new groups of furniture will be designed with the standard blank sizes, and rough-part sizes currently needed may be changed to take advantage of the standard sizes.

Summary

Program BLANKS allows manufacturers to quickly analyze their rough-part requirements as if they were being produced from a few standard sizes of ready-to-use, edge-glued blanks. With information on the number of blanks needed, yields, and costs, manufacturers can evaluate standard-size blanks as a solid wood input material and decide on total or partial adoption of this concept. The output from program BLANKS also aids manufacturers in better understanding rough-part needs and costs.

Literature Cited

Araman, Philip A.; Gatchell, Charles J.; Reynolds, Hugh W. Meeting the solid wood needs of the furniture and cabinet industries: standard-size hardwood blanks. Res. Pap. NE-494. Broomall, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station; 1982. 27 p.

Table 2.—Parts from standard-size blanks summary—Group B 4/4 cherry clear-quality requirements

Blank size (inches)	Number needed	Blank	Parts	Percent yield	Total cost	Percent reglu-able	Reglu-able value	Percent end waste	Percent edge waste	Percent total waste
		----- *ft²* -----			*Dollars*		*Dollars*			
15 × 26	16	43	36	0.83	63.27	0.01	0.83	0.07	0.09	0.15
18 × 26	137	445	376	0.85	650.06	0.00	1.25	0.08	0.07	0.15
21 × 26	75	284	259	0.91	415.19	0.00	0.87	0.04	0.05	0.09
25 × 26	25	113	90	0.80	164.76	0.04	5.96	0.09	0.07	0.16
29 × 26	58	304	255	0.84	443.39	0.01	5.32	0.07	0.08	0.15
33 × 26	44	262	241	0.92	382.76	0.01	4.16	0.00	0.07	0.07
38 × 26	78	535	454	0.85	781.34	0.01	8.71	0.05	0.09	0.14
Total	433	1987	1712	0.86	2900.78	0.01	27.10	0.05	0.08	0.13

Table 3.—Summary of company's 90-day 4/4 cherry clear-quality needs in standard-size blanks

Group	Number of blanks required									
	15 × 26	18 × 26	21 × 26	25 × 26	29 × 26	33 × 26	38 × 26	45 × 26	50 × 26	60 × 26
A	—	—	—	—	—	—	—	—	—	—
B	16	137	75	25	58	44	78	—	—	—
C	—	—	—	—	—	—	—	—	—	—
D	849	1906	959	1818	622	277	16	51	203	38
E	—	—	—	—	—	—	—	—	—	—
F	72	148	167	106	25	—	—	—	54	—
G	—	—	—	—	—	—	—	—	—	—
H	204	120	115	772	50	19	400	25	—	—
I	95	35	86	379	27	—	300	37	—	—
J	—	—	—	—	—	—	—	—	—	—
K	—	—	—	—	—	—	—	—		—
L	—	—	—	—	—	—	—	—	—	—
M	310	70	185	54	9	7	9	—	27	—
N	—	—	—	—	—	—	—	—	—	—
Total	1546	2416	1587	3154	791	347	803	113	284	38

Table 4.—Parts from standard-size blanks summary—Group B 4/4 cherry clear-quality requirements after changes made in rough-part lengths

Blank size (inches)	Number needed	Blank	Parts	Percent yield	Total cost	Percent reglu-able	Reglu-able value	Percent end waste	Percent edge waste	Percent total waste
		--- *ft²* ---			Dollars		Dollars			
15 × 26	79	214	192	0.90	312.38	0.00	0.00	0.01	0.09	0.10
18 × 26	80	260	218	0.84	379.60	0.11	41.70	0.02	0.03	0.05
21 × 26	75	284	259	0.91	415.19	0.00	0.87	0.04	0.05	0.09
25 × 26	50	226	192	0.85	329.51	0.02	5.73	0.04	0.09	0.13
29 × 26	33	173	151	0.87	252.28	0.02	5.70	0.03	0.07	0.11
33 × 26	59	352	316	0.90	513.25	0.01	6.81	0.00	0.09	0.09
38 × 26	64	439	378	0.86	641.10	0.01	8.44	0.04	0.09	0.13
Total	440	1947	1706	0.88	2843.31	0.02	69.24	0.03	0.07	0.10

Appendix

Note to Programers

Program BLANKS can be run in a batch or an interactive mode. Data input prompts have been placed in the program to aid those who use an interactive system. These prompts and some intermediate printing of results also will appear in the batch mode printouts and can be eliminated by removing the following cards: BLNK 33, BLNK 38, BLNK 44, BLNK 125, BLNK 130, BLNK 131, BLNK 172, BLNK 174, BLNK 176, BLNK 177, BLNK 179, BLNK 180, BLNK 181, and BLNK 182.

```
C*************************************************************************BLNK   1
C                                                                         BLNK   2
C     PROGRAM BLANKS                                                      BLNK   3
C                                                                         BLNK   4
C     PROGRAMMER: P.A. ARAMAN                 DATE: JULY 14,1982        BLNK   5
C                 U.S. FOREST SERVICE                                     BLNK   6
C                 PRINCETON, WV                                           BLNK   7
C                                                                         BLNK   8
C     PROGRAM SIMULATES MAKING ROUGH DIMENSION PARTS FROM STANDARD-SIZE BLNK   9
C     BLANKS.  THE PROGRAM COMPILES AND PRINTS A SUMMARY OF THE RESULTS.BLNK   10
C*************************************************************************BLNK   11
      INTEGER NN(50),BLANKS,B,LPC,BBLANK(50)/50*0/,B1,NNE(50)           BLNK   12
      REAL LT(50),WT(50)/50*0./,SBLT(50)/50*0./,SBWT(50)/50*0./,SBSQFT(5BLNK   13
     10)/50*0./,SCSQFT(50)/50*0./,SUTILP(50)/50*0./,STCOST(50)/50*0./,SRBLNK   14
     2EGP(50)/50*0./,SRGVAL(50)/50*0./,SWASTP(50)/50*0./,SETRIM(50)/50*0BLNK   15
     3./,SKERFE(50)/50*0./                                              BLNK   16
      B1=0                                                              BLNK   17
      I5=0                                                              BLNK   18
      S1=0.                                                             BLNK   19
      S2=0.                                                             BLNK   20
      S3=0.                                                             BLNK   21
      S4=0.                                                             BLNK   22
      S5=0.                                                             BLNK   23
      W1=0.                                                             BLNK   24
20    BLANKS=0.                                                         BLNK   25
      REGLUE=0.                                                         BLNK   26
      WASTE=0.                                                          BLNK   27
      CSQFT=0.                                                          BLNK   28
      ETRIM=0.                                                          BLNK   29
C                                                                       BLNK   30
C     READ STANDARD BLANK LENGTH, WIDTH AND PRICE                       BLNK   31
C                                                                       BLNK   32
      WRITE (6,210)                                                     BLNK   33
      READ (5,220) BLT,BWT,BPRICE                                       BLNK   34
C                                                                       BLNK   35
C     READ NUMBER OF DIFFERENT CUTTINGS THAT FOLLOW TO BE READ          BLNK   36
C                                                                       BLNK   37
      WRITE (6,230)                                                     BLNK   38
      READ (5,240) N                                                    BLNK   39
C                                                                       BLNK   40
C     MUST READ IN WIDEST TO NARROWEST WIDTH                            BLNK   41
C     LENGTHS CAN BE OUT OF ORDER                                       BLNK   42
C                                                                       BLNK   43
      WRITE (6,250)                                                     BLNK   44
C                                                                       BLNK   45
C     READ CUTTINGS NEEDED                                              BLNK   46
C                                                                       BLNK   47
      DO 30 I=1,N                                                       BLNK   48
      READ (5,260) III,LT(I),WT(I),NN(I)                                BLNK   49
      CSQFT=(LT(I)*WT(I)*NN(I))/144.+CSQFT                              BLNK   50
      ETRIM=ETRIM+((BLT-LT(I))*WT(I)*NN(I))/144.                        BLNK   51
30    NNE(I)=NN(I)                                                      BLNK   52
      DO 190 I=1,N                                                      BLNK   53
      IF (NNE(I).LE.0) GO TO 190                                        BLNK   54
      B=BWT/(WT(I)+.125)                                                BLNK   55
```

```
      BCHECK=B*(WT(I)+.125)+WT(I)                                       BLNK  56
      IF (BCHECK.LE.BWT) B=B+1                                          BLNK  57
      BN=FLOAT(NNE(I))/FLOAT(B)                                         BLNK  58
      IF (BN-IFIX(BN).EQ.0.) GO TO 40                                   BLNK  59
      BN1=1-(BN-IFIX(BN))                                               BLNK  60
      GO TO 50                                                          BLNK  61
40    BN1=0.                                                            BLNK  62
50    IF (BN1.GT.0) BLANKS=BLANKS+1                                     BLNK  63
      BLANKS=BLANKS+BN                                                  BLNK  64
      NNE(I)=0                                                          BLNK  65
C                                                                       BLNK  66
C     BN1 IS FRACTION OF LAST BLANK LEFT                                BLNK  67
C                                                                       BLNK  68
      W=BWT-B*(WT(I)+.125)                                              BLNK  69
      IF (W.GE.1.) GO TO 60                                             BLNK  70
      WASTE=WASTE+IFIX(BN)*W                                            BLNK  71
      GO TO 150                                                         BLNK  72
60    IF (I.LT.N) GO TO 90                                              BLNK  73
      GO TO 80                                                          BLNK  74
70    II=II+1                                                           BLNK  75
      IF (II.GT.N) GO TO 80                                             BLNK  76
      GO TO 100                                                         BLNK  77
80    REGLUE=REGLUE+IFIX(BN)*W*BLT                                      BLNK  78
      GO TO 150                                                         BLNK  79
C                                                                       BLNK  80
C     CAN EDGING BE USED                                                BLNK  81
C                                                                       BLNK  82
90    II=I+1                                                            BLNK  83
100   IF (WT(II).GT.W) GO TO 70                                         BLNK  84
      IF (NNE(II).LE.0) GO TO 120                                       BLNK  85
      BS=W/(WT(II)+.125)                                                BLNK  86
      BND=NNE(II)/BS                                                    BLNK  87
      IF (BND.LT.BN) GO TO 110                                          BLNK  88
      NNE(II)=NNE(II)-IFIX(BS)*IFIX(BN)                                 BLNK  89
C                                                                       BLNK  90
C      REDEFINE W AFTER SECONDARY CUTTINGS HAVE BEEN REMOVED AMR        BLNK  91
C                                                                       BLNK  92
      W=W-(WT(II)+.125)*IFIX(BS)                                        BLNK  93
      IF (W.GE.1) GO TO 70                                              BLNK  94
      GO TO 150                                                         BLNK  95
110   NNE(II)=0                                                         BLNK  96
      IF (II.EQ.N) GO TO 130                                            BLNK  97
      BN=BN-BND                                                         BLNK  98
120   II=II+1                                                           BLNK  99
      IF (II.GT.N) GO TO 80                                             BLNK 100
      GO TO 100                                                         BLNK 101
130   REGLUE=REGLUE+BLT*W*(BN-BND)                                      BLNK 102
      GO TO 190                                                         BLNK 103
140   REGLUE=REGLUE+BLT*BN1*BWT                                         BLNK 104
      GO TO 190                                                         BLNK 105
C                                                                       BLNK 106
C     USE FRACTION OF LAST BLANK                                        BLNK 107
C                                                                       BLNK 108
150   IF (BN1.EQ.0) GO TO 190                                           BLNK 109
      II=I+1                                                            BLNK 110
```

```
160   IF (II.GT.N) GO TO 140                                                BLNK 111
      IF (NNE(II).GT.0) GO TO 170                                           BLNK 112
      II=II+1                                                               BLNK 113
      GO TO 160                                                             BLNK 114
170   LPC=(BN1*BWT)/(WT(II)+.125)                                           BLNK 115
      IF (LPC.GT.NNE(II)) GO TO 180                                         BLNK 116
      NNE(II)=NNE(II)-LPC                                                   BLNK 117
      BN1=0.                                                                BLNK 118
      GO TO 190                                                             BLNK 119
180   BN1=((BN1*BWT)-(WT(II)+.125)*NNE(II))/BWT                             BLNK 120
      NNE(II)=0                                                             BLNK 121
      GO TO 140                                                             BLNK 122
190   CONTINUE                                                              BLNK 123
      TCOST=BLANKS*BPRICE*BLT*BWT/144.                                      BLNK 124
      WRITE (6,270) BLT,BWT,BLANKS,BPRICE,TCOST                             BLNK 125
      BVOL=BLANKS*BLT*BWT/144.                                              BLNK 126
      REGP=REGLUE/144./BVOL                                                 BLNK 127
      REGLUE=REGLUE/144.                                                    BLNK 128
      UTILP=CSQFT/BVOL                                                      BLNK 129
      WRITE (6,280) CSQFT,UTILP,REGLUE,REGP                                 BLNK 130
      WRITE (6,290)                                                         BLNK 131
      READ (5,300) N5                                                       BLNK 132
      I5=I5+1                                                               BLNK 133
      SBLT(I5)=BLT                                                          BLNK 134
      SBWT(I5)=BWT                                                          BLNK 135
      SBSQFT(I5)=BVOL                                                       BLNK 136
      SCSQFT(I5)=CSQFT                                                      BLNK 137
      SUTILP(I5)=UTILP                                                      BLNK 138
      BBLANK(I5)=BLANKS                                                     BLNK 139
      STCOST(I5)=TCOST                                                      BLNK 140
      SREGP(I5)=REGP                                                        BLNK 141
      SRGVAL(I5)=TCOST*REGP                                                 BLNK 142
      SETRIM(I5)=ETRIM/BVOL                                                 BLNK 143
      SWASTP(I5)=1.-UTILP-REGP                                              BLNK 144
      SKERFE(I5)=SWASTP(I5)-SETRIM(I5)                                      BLNK 145
      S1=S1+SBSQFT(I5)                                                      BLNK 146
      S2=S2+SCSQFT(I5)                                                      BLNK 147
      S3=S3+REGLUE                                                          BLNK 148
      S4=S4+TCOST                                                           BLNK 149
      S5=S5+TCOST*REGP                                                      BLNK 150
      B1=B1+BLANKS                                                          BLNK 151
      W1=W1+ETRIM                                                           BLNK 152
      IF (N5.EQ.1) GO TO 20                                                 BLNK 153
C                                                                           BLNK 154
C     WRITE RESULTS                                                         BLNK 155
C                                                                           BLNK 156
      WRITE (6,310)                                                         BLNK 157
      WRITE (6,320)                                                         BLNK 158
      DO 200 I6=1,I5                                                        BLNK 159
      WRITE (6,330) SBLT(I6),SBWT(I6),BBLANK(I6),SBSQFT(I6),SCSQFT(I6),SBLNK 160
     1UTILP(I6),STCOST(I6),SREGP(I6),SRGVAL(I6),SETRIM(I6),SKERFE(I6),SWBLNK 161
     2ASTP(I6)                                                              BLNK 162
200   CONTINUE                                                              BLNK 163
      CYIELD=S2/S1                                                          BLNK 164
      RYIELD=S3/S1                                                          BLNK 165


      WYIELD=1.-CYIELD-RYIELD                                               BLNK 166
      W12=W1/S1                                                             BLNK 167
      W13=WYIELD-W12                                                        BLNK 168
      WRITE (6,340) B1,S1,S2,CYIELD,S4,RYIELD,S5,W12,W13,WYIELD             BLNK 169
      STOP                                                                  BLNK 170
C                                                                           BLNK 171
210   FORMAT (1H0,24HBLANK LENGTH WIDTH PRICE)                              BLNK 172
220   FORMAT (6X,F6.0,F6.0,F6.0)                                            BLNK 173
230   FORMAT (1H0,37HNO. OF DIFFERENT CUTTINGS TO BE READ?)                 BLNK 174
240   FORMAT (I2)                                                           BLNK 175
250   FORMAT (1H0,35HMUST BE READ IN WIDEST TO NARROWEST/1H ,4X,18HLENGTBLNK 176
     1H WIDTH   NO.)                                                        BLNK 177
260   FORMAT (I1,2X,F6.0,1X,F6.0,1X,I4)                                     BLNK 178
270   FORMAT (1H0,F6.0,1HX,F6.0,4X,I4,4X,3H@ $,F6.2,3H= $,F8.2)             BLNK 179
280   FORMAT (1H0,6HCSQFT=,F8.2/1H0,19HBLANKS UTILIZATION=,F4.2/9H0         BLNK 180
     1   ,20HREGLUEABLE MATERIAL=,F8.2/1H0,15HREGLUEABLE PCT=,F4.2)        BLNK 181
290   FORMAT (1H0,45HIF ANOTHER RUN IS NEEDED TYPE 1 IF NOT TYPE 2)         BLNK 182
300   FORMAT (I1)                                                           BLNK 183
310   FORMAT (1H1///)                                                       BLNK 184
320   FORMAT (1H0,7HSUMMARY/1H0,96HBLANK   BLANK   NUMBER   BLANK   PARTBLNK 185
     1S   %       TOTAL   %        REGLUE  % END  % EDGE  % TOTAL/1H ,94BLNK 186
     2HLT      WT      NEEDED   SQFT    SQFT    YIELD   COST    REGLUE  BLNK 187
     3 VALUE   WASTE  WASTE   WASTE/1H ,96H----------------------------BLNK 188
     4-------------------------------------------------------------BLNK 189
     5-)                                                                    BLNK 190
330   FORMAT (1H0,F4.0,5X,F3.0,I7,5X,F7.0,1X,F7.0,2X,F4.2,1X,F8.2,3X,F4.BLNK 191
     12,3X,F7.2,4X,F4.2,4X,F4.2,4X,F4.2)                                    BLNK 192
340   FORMAT (1H0,96H----------------------------------------------------BLNK 193
     1-----------------------------------------/1H0,6HTOTALS,9X,I5,2BLNK 194
     2X,F9.0,F9.0,1X,F4.2,1X,F8.2,3X,F4.2,3X,F7.2,4X,F4.2,4X,F4.2,4X,F4.BLNK 195
     32)                                                                    BLNK 196
      END                                                                   BLNK 197
```

Araman, Philip A. BLANKS: A computer program for analyzing furniture rough-part needs in standard-size blanks. Res. Pap. NE-521. Broomall, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station; 1983. 8 p.

A computer program is described that allows a company to determine the number of edge-glued, standard-size blanks required to satisfy its rough-part needs for a given production period. Yield and cost information also is determined by the program. A list of the program inputs, outputs, and uses of outputs is described, and an example analysis with sample output is included.

ODC 836.1: 854.1

Keywords: Furniture rough-part sizes; cabinet rough-part sizes; hardwood lumber; panels

Headquarters of the Northeastern Forest Experiment Station are in Broomall, Pa. Field laboratories are maintained at:

- **Amherst, Massachusetts, in cooperation with the University of Massachusetts.**
- **Berea, Kentucky, in cooperation with Berea College.**
- **Burlington, Vermont, in cooperation with the University of Vermont.**
- **Delaware, Ohio.**
- **Durham, New Hampshire, in cooperation with the University of New Hampshire.**
- **Hamden, Connecticut, in cooperation with Yale University.**
- **Morgantown, West Virginia, in cooperation with West Virginia University, Morgantown.**
- **Orono, Maine, in cooperation with the University of Maine, Orono.**
- **Parsons, West Virginia.**
- **Princeton, West Virginia.**
- **Syracuse, New York, in cooperation with the State University of New York College of Environmental Sciences and Forestry at Syracuse University, Syracuse.**
- **University Park, Pennsylvania, in cooperation with the Pennsylvania State University.**
- **Warren, Pennsylvania.**

☆U.S. GOVERNMENT PRINTING OFFICE: 1982- 605-024:56