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/* File name : Primary1.yal */
/* Copyright (C) 1987 by Bryan Preas and Ken Roberts. */
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/* Primary1.yal (CIRCUITX). This is a medium sized peripheral */
/* interface chip. It has a fairly random mix of sequential */
/* and combinational logic. */
/* Rules: - May be layed out as either a gate array or */
/* standard circuit. */
/* - The required pad placement is given below. */
/* - For standard cell, the library is SCLib. */
/* - For gate array, the library is GALib. The gate */
/* array parameters are: */
/* Rows - 26 */
/* Columns - 300 placement slots/row (6000u) */
/* Pads - 21 per side */
/* Routing channels - 13 tracks each */
/* Circuit statistics: 752 cells */
/* IO Pads: 81 */
/* Total nets: 904 */
/* Internal utilization for gate array: 86% */
/* */
/* sclib follows */
/* File name SCLib.yal */

/* Copyright (C) 1987 by Bryan Preas and Ken Roberts. */
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/* Library: SCLib.yal */
/* Technology: Standard cell, 2-metal routing. */
/* Design rules: Metal width, 4u, both levels. */
/* Via size = 4u. */
/* Via oversize = 1u */
/* Metal spacing = 5u (both levels). */
/* Routing grid: 10u on both levels. Horizontally and */
/* vertically adjacent vias NOT allowed, */
/* but diagonally adjacent vias OK. */
/* Cell characteristics: */
/* Cell placements can abut, but not */
/* overlap. The legal orientations for */
/* internal cell placements are normal */
/* (RFLNONE ROT0) and reflected about Y */
/* (RFLY ROT0). */
/* Over-cell feedthru paths are provided */
/* in the cell definitions. You should */
/* indicate in your results whether or */
/* not your system can make use of them. */
/* Feedthrus external to cells must be */
/* centered at least 5u from the near- */
/* cell boundary. A feedthru cell, */
/* which can be abutted to cells is */
/* provided in case your system re- */
/* quires it. */
/* Pad cells are placed at 300u */
/* increments. Pad cell orientations */
/* are: right side - RFLNONE ROT0

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/*          left side - RFLY ROT0          */
/*          top       - RFLY ROT270        */
/*          bottom    - RFLNONE ROT270     */
/*                                          */
/*                                          */
/*                                          */
/* Cell FEED. Feedthrough cell.           */
/*                                          */
MODULE FEED;
  TYPE FEEDTHROUGH;
  WIDTH 10;
  HEIGHT 150;
  IOLIST;
    F1 F BOTTOM 5 4 METAL2;
    F1 F TOP   5 4 METAL2;
  ENDIOLIST;
ENDMODULE;
/*                                          */
/*                                          */
/* Cell G11. Combinational gate, 1 input, 1 output. */
/*                                          */
MODULE G11;
  TYPE STANDARD;
  WIDTH 30;
  HEIGHT 150;
  IOLIST;
    I1 I BOTTOM 5 4 METAL2;
    I1 I TOP   5 4 METAL2;
    O1 O BOTTOM 15 4 METAL2;
    O1 O TOP   15 4 METAL2;
    F1 F BOTTOM 25 4 METAL2;
    F1 F TOP   25 4 METAL2;
  ENDIOLIST;
ENDMODULE;
/*                                          */
/*                                          */
/* Cell G21. Combinational gate, 2 inputs, 1 output. */
/*                                          */
MODULE G21;
  TYPE STANDARD;
  WIDTH 50;
  HEIGHT 150;
  IOLIST;
    I1 I BOTTOM 5 4 METAL2;
    I1 I TOP   5 4 METAL2;
    I2 I BOTTOM 25 4 METAL2;
    I2 I TOP   25 4 METAL2;
    O1 O BOTTOM 35 4 METAL2;
    O1 O TOP   35 4 METAL2;
    F2 F BOTTOM 15 4 METAL2;
    F2 F TOP   15 4 METAL2;
    F3 F BOTTOM 45 4 METAL2;
    F3 F TOP   45 4 METAL2;
  ENDIOLIST;
ENDMODULE;
/*                                          */
/*                                          */
/* Cell G31. Combinational gate, 3 inputs, 1 output. */
/*                                          */
MODULE G31;
  TYPE STANDARD;
  WIDTH 60;
  HEIGHT 150;
  IOLIST;
    I1 I BOTTOM 5 4 METAL2;
    I1 I TOP   5 4 METAL2;
    I2 I BOTTOM 15 4 METAL2;
    I2 I TOP   15 4 METAL2;
    I3 I BOTTOM 35 4 METAL2;

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I3 I TOP 35 4 METAL2;
O1 O BOTTOM 45 4 METAL2;
O1 O TOP 45 4 METAL2;
F2 F BOTTOM 55 4 METAL2;
F2 F TOP 55 4 METAL2;
ENDIOLIST;
ENDMODULE;
/* */
/* */
/* Cell G41. Combinational gate, 4 inputs, 1 output. */
/* */
MODULE G41;
TYPE STANDARD;
WIDTH 70;
HEIGHT 150;
IOLIST;
I1 I BOTTOM 5 4 METAL2;
I1 I TOP 5 4 METAL2;
I2 I BOTTOM 15 4 METAL2;
I2 I TOP 15 4 METAL2;
I3 I BOTTOM 35 4 METAL2;
I3 I TOP 35 4 METAL2;
I4 I BOTTOM 45 4 METAL2;
I4 I TOP 45 4 METAL2;
O1 O BOTTOM 55 4 METAL2;
O1 O TOP 55 4 METAL2;
F2 F BOTTOM 65 4 METAL2;
F2 F TOP 65 4 METAL2;
ENDIOLIST;
ENDMODULE;
/* */
/* */
/* Cell G61. Combinational gate, 6 inputs, 1 output. */
/* */
MODULE G61;
TYPE STANDARD;
WIDTH 100;
HEIGHT 150;
IOLIST;
I1 I BOTTOM 5 4 METAL2;
I1 I TOP 5 4 METAL2;
I2 I BOTTOM 15 4 METAL2;
I2 I TOP 15 4 METAL2;
I3 I BOTTOM 35 4 METAL2;
I3 I TOP 35 4 METAL2;
I4 I BOTTOM 45 4 METAL2;
I4 I TOP 45 4 METAL2;
I5 I BOTTOM 65 4 METAL2;
I5 I TOP 65 4 METAL2;
I6 I BOTTOM 75 4 METAL2;
I6 I TOP 75 4 METAL2;
O1 O BOTTOM 85 4 METAL2;
O1 O TOP 85 4 METAL2;
F1 F BOTTOM 25 4 METAL2;
F1 F TOP 25 4 METAL2;
F2 F BOTTOM 95 4 METAL2;
F2 F TOP 95 4 METAL2;
ENDIOLIST;
ENDMODULE;
/* */
/* */
/* Cell G81. Combinational gate, 8 inputs, 1 output. */
/* */
MODULE G81;
TYPE STANDARD;
WIDTH 160;
HEIGHT 150;
IOLIST;
I1 I BOTTOM 5 4 METAL2;
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I1 I TOP 5 4 METAL2;
I2 I BOTTOM 15 4 METAL2;
I2 I TOP 15 4 METAL2;
I3 I BOTTOM 25 4 METAL2;
I3 I TOP 25 4 METAL2;
I4 I BOTTOM 35 4 METAL2;
I4 I TOP 35 4 METAL2;
I5 I BOTTOM 115 4 METAL2;
I5 I TOP 115 4 METAL2;
I6 I BOTTOM 125 4 METAL2;
I6 I TOP 125 4 METAL2;
I7 I BOTTOM 135 4 METAL2;
I7 I TOP 135 4 METAL2;
I8 I BOTTOM 145 4 METAL2;
I8 I TOP 145 4 METAL2;
O1 O BOTTOM 75 4 METAL2;
O1 O TOP 75 4 METAL2;
F1 F BOTTOM 45 4 METAL2;
F1 F TOP 45 4 METAL2;
F2 F BOTTOM 55 4 METAL2;
F2 F TOP 55 4 METAL2;
F3 F BOTTOM 85 4 METAL2;
F3 F TOP 85 4 METAL2;
F4 F BOTTOM 155 4 METAL2;
F4 F TOP 155 4 METAL2;
ENDIOLIST;
ENDMODULE;
/* */
/* */
/* Cell G12. Combinational gate, 1 input, 2 outputs. */
/* */
MODULE G12;
TYPE STANDARD;
WIDTH 60;
HEIGHT 150;
IOLIST;
I1 I BOTTOM 5 4 METAL2;
I1 I TOP 5 4 METAL2;
O1 O BOTTOM 35 4 METAL2;
O1 O TOP 35 4 METAL2;
O2 O BOTTOM 45 4 METAL2;
O2 O TOP 45 4 METAL2;
F1 F BOTTOM 15 4 METAL2;
F1 F TOP 15 4 METAL2;
F2 F BOTTOM 55 4 METAL2;
F2 F TOP 55 4 METAL2;
ENDIOLIST;
ENDMODULE;
/* */
/* */
/* Cell F22. Sequential function 2 inputs, 2 outputs. */
/* */
MODULE F22;
TYPE STANDARD;
WIDTH 140;
HEIGHT 150;
IOLIST;
I1 I BOTTOM 15 4 METAL2;
I1 I TOP 15 4 METAL2;
I2 I BOTTOM 45 4 METAL2;
I2 I TOP 45 4 METAL2;
O1 O BOTTOM 105 4 METAL2;
O1 O TOP 105 4 METAL2;
O2 O BOTTOM 125 4 METAL2;
O2 O TOP 125 4 METAL2;
F1 F BOTTOM 5 4 METAL2;
F1 F TOP 5 4 METAL2;
F2 F BOTTOM 35 4 METAL2;
F2 F TOP 35 4 METAL2;

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F3 F BOTTOM 75 4 METAL2;
F3 F TOP 75 4 METAL2;
F4 F BOTTOM 95 4 METAL2;
F4 F TOP 95 4 METAL2;
F5 F BOTTOM 115 4 METAL2;
F5 F TOP 115 4 METAL2;
F6 F BOTTOM 135 4 METAL2;
F6 F TOP 135 4 METAL2;
ENDIOLIST;
ENDMODULE;
/* */
/* */
/* Cell F32. Sequential function 3 inputs, 2 outputs. */
/* */
MODULE F32;
TYPE STANDARD;
WIDTH 200;
HEIGHT 150;
IOLIST;
I1 I BOTTOM 15 4 METAL2;
I1 I TOP 15 4 METAL2;
I2 I BOTTOM 55 4 METAL2;
I2 I TOP 55 4 METAL2;
I3 I BOTTOM 95 4 METAL2;
I3 I TOP 95 4 METAL2;
O1 O BOTTOM 155 4 METAL2;
O1 O TOP 155 4 METAL2;
O2 O BOTTOM 175 4 METAL2;
O2 O TOP 175 4 METAL2;
F1 F BOTTOM 5 4 METAL2;
F1 F TOP 5 4 METAL2;
F2 F BOTTOM 35 4 METAL2;
F2 F TOP 35 4 METAL2;
F3 F BOTTOM 65 4 METAL2;
F3 F TOP 65 4 METAL2;
F4 F BOTTOM 85 4 METAL2;
F4 F TOP 85 4 METAL2;
F5 F BOTTOM 115 4 METAL2;
F5 F TOP 115 4 METAL2;
F6 F BOTTOM 135 4 METAL2;
F6 F TOP 135 4 METAL2;
F7 F BOTTOM 195 4 METAL2;
F7 F TOP 195 4 METAL2;
ENDIOLIST;
ENDMODULE;
/* */
/* */
/* Cell F42. Sequential function 4 inputs, 2 outputs. */
/* */
MODULE F42;
TYPE STANDARD;
WIDTH 200;
HEIGHT 150;
IOLIST;
I1 I BOTTOM 15 4 METAL2;
I1 I TOP 15 4 METAL2;
I2 I BOTTOM 55 4 METAL2;
I2 I TOP 55 4 METAL2;
I3 I BOTTOM 95 4 METAL2;
I3 I TOP 95 4 METAL2;
I4 I BOTTOM 125 4 METAL2;
I4 I TOP 125 4 METAL2;
O1 O BOTTOM 155 4 METAL2;
O1 O TOP 155 4 METAL2;
O2 O BOTTOM 175 4 METAL2;
O2 O TOP 175 4 METAL2;
F1 F BOTTOM 5 4 METAL2;
F1 F TOP 5 4 METAL2;
F2 F BOTTOM 35 4 METAL2;

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F2 F TOP 35 4 METAL2;
F3 F BOTTOM 85 4 METAL2;
F3 F TOP 85 4 METAL2;
F4 F BOTTOM 115 4 METAL2;
F4 F TOP 115 4 METAL2;
F5 F BOTTOM 135 4 METAL2;
F5 F TOP 135 4 METAL2;
F6 F BOTTOM 165 4 METAL2;
F6 F TOP 165 4 METAL2;
F7 F BOTTOM 195 4 METAL2;
F7 F TOP 195 4 METAL2;
ENDIOLIST;
ENDMODULE;
/* */
/* */
/* Cell I1. Input pad cell, 1 output. */
/* */
MODULE I1;
TYPE PAD;
WIDTH 600;
HEIGHT 300;
IOLIST;
I1 PI RIGHT 150 0 METAL2;
O1 O LEFT 155 4 METAL1;
ENDIOLIST;
ENDMODULE;
/* */
/* */
/* Cell I2. Input pad cell, 2 outputs. */
/* */
MODULE I2;
TYPE PAD;
WIDTH 600;
HEIGHT 300;
IOLIST;
I1 PI RIGHT 150 0 METAL2;
O1 O LEFT 145 4 METAL1;
O2 O LEFT 165 4 METAL1;
ENDIOLIST;
ENDMODULE;
/* */
/* */
/* Cell O1. Output pad cell, 1 input. */
/* */
MODULE O1;
TYPE PAD;
WIDTH 600;
HEIGHT 300;
IOLIST;
I1 I LEFT 155 4 METAL1;
O1 PO RIGHT 150 0 METAL2;
ENDIOLIST;
ENDMODULE;
/* */
/* */
/* Cell O2. Output pad cell, 2 inputs. */
/* */
MODULE O2;
TYPE PAD;
WIDTH 600;
HEIGHT 300;
IOLIST;
I1 I LEFT 145 4 METAL1;
I2 I LEFT 165 4 METAL1;
O1 PO RIGHT 150 0 METAL2;
ENDIOLIST;
ENDMODULE;
/* */
/* */

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/* Cell B21. Bidirectional pad cell, 2 inputs, 1 output. */
/*
MODULE B21;
  TYPE PAD;
  WIDTH 600;
  HEIGHT 300;
  IOLIST;
    I1 I LEFT 145 4 METAL1;
    I2 I LEFT 155 4 METAL1;
    O1 O LEFT 165 4 METAL1;
    B1 PB RIGHT 150 0 METAL2;
  ENDIOLIST;
ENDMODULE;

MODULE CIRCUITX ;
  TYPE PARENT ;
  WIDTH 6000 ;
  HEIGHT 6000 ;
  IOLIST ;
  S3 PI RIGHT 3000 ;
  S4 PI RIGHT 3600 ;
  S5 PI RIGHT 4200 ;
  S6 PI RIGHT 4800 ;
  S7 PI RIGHT 5400 ;
  S8 PI BOTTOM 300 ;
  S9 PI LEFT 5100 ;
  S10 PI LEFT 5700 ;
  S11 PI BOTTOM 4800 ;
  S12 PI BOTTOM 4200 ;
  S13 PI BOTTOM 6000 ;
  S14 PI BOTTOM 5700 ;
  S15 PI LEFT 2400 ;
  S16 PI LEFT 900 ;
  S17 PI LEFT 300 ;
  S18 PI TOP 5400 ;
  S19 PI TOP 4800 ;
  S20 PI TOP 4200 ;
  S21 PI TOP 3600 ;
  S22 PI TOP 3000 ;
  S23 PI TOP 2400 ;
  S24 PI TOP 1800 ;
  S25 PI TOP 1200 ;
  S26 PI TOP 600 ;
  S27 PI TOP 0 ;
  S28 PI BOTTOM 2100 ;
  S29 PI BOTTOM 1500 ;
  S30 PI BOTTOM 900 ;
  S31 PI BOTTOM 2700 ;
  S32 PI BOTTOM 5400 ;
  S33 PI BOTTOM 3900 ;
  S34 PI LEFT 3900 ;
  S35 PO LEFT 3600 ;
  S36 PO LEFT 4500 ;
  S37 PO LEFT 4800 ;
  S38 PO LEFT 6000 ;
  S39 PO LEFT 5400 ;
  S40 PO LEFT 4200 ;
  S41 PO LEFT 3000 ;
  S42 PO LEFT 600 ;
  S43 PO LEFT 1200 ;
  S44 PO LEFT 1500 ;
  S45 PO LEFT 1800 ;
  S46 PO LEFT 2100 ;
  S47 PO LEFT 2700 ;
  S48 PO BOTTOM 1200 ;
  S49 PO BOTTOM 600 ;
  S50 PO BOTTOM 4500 ;
  S51 PO BOTTOM 5100 ;
  S52 PO LEFT 3300 ;
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S53 PO BOTTOM 3600 ;
S54 PO BOTTOM 2400 ;
S55 PO BOTTOM 3000 ;
S56 PO BOTTOM 1800 ;
S57 PO TOP 6000 ;
S58 PO TOP 5700 ;
S59 PO TOP 5100 ;
S60 PO TOP 4500 ;
S61 PO TOP 3900 ;
S62 PO TOP 3300 ;
S63 PO TOP 2700 ;
S64 PO TOP 2100 ;
S65 PO TOP 1500 ;
S66 PO TOP 900 ;
S67 PO TOP 300 ;
S68 PB RIGHT 0 ;
S69 PB RIGHT 300 ;
S70 PB RIGHT 600 ;
S71 PB RIGHT 900 ;
S72 PB RIGHT 1200 ;
S73 PB RIGHT 1500 ;
S74 PB RIGHT 1800 ;
S75 PB RIGHT 2100 ;
S76 PB RIGHT 2400 ;
S77 PB RIGHT 2700 ;
S78 PB RIGHT 3300 ;
S79 PB RIGHT 3900 ;
S80 PB RIGHT 4500 ;
S81 PB RIGHT 5100 ;
S82 PB RIGHT 5700 ;
S83 PB BOTTOM 0 ;
ENDIOLIST ;
NETWORK ;
C1 G12 S84 S323 S324 ;
C2 G12 S323 U1 S88 ;
C3 G12 S323 U2 S89 ;
C4 F32 S324 S327 S85 S328 U3 ;
C5 F32 S324 S328 S85 S330 S331 ;
C6 F32 S331 S332 S85 S333 S332 ;
C7 G12 S333 S91 S90 ;
C8 G31 S87 S86 S85 S334 ;
C9 G12 S334 S335 S336 ;
C10 G11 S336 S92 ;
C11 G21 S328 S330 S327 ;
C12 G11 S335 S93 ;
C13 F32 S339 S357 S358 S131 S342 ;
C14 F32 S339 S359 S358 S132 S360 ;
C15 F32 S339 S361 S358 S133 S343 ;
C16 F32 S339 S362 S111 S149 U4 ;
C17 G41 S342 S364 S104 S105 S357 ;
C18 G41 S360 S365 S104 S106 S359 ;
C19 G41 S104 S107 S366 S343 S361 ;
C20 G41 S134 S338 S108 S109 S367 ;
C21 G41 S342 S368 S107 S369 S346 ;
C22 G31 S370 S346 S367 S362 ;
C23 G31 S360 S103 S344 S371 ;
C24 G31 S132 S102 S371 S368 ;
C25 G31 S368 S338 S372 S366 ;
C26 F32 S109 U5 S373 S369 S344 ;
C27 G11 S345 S372 ;
C28 G31 S112 S128 S338 S373 ;
C29 G31 S368 S337 S342 S374 ;
C30 G31 S133 S135 S340 S365 ;
C31 G31 S110 S341 S123 S370 ;
C32 G31 S123 S114 S115 S345 ;
C33 G11 S135 S134 ;
C34 G21 S343 S342 S146 ;
C35 G21 S149 S122 S135 ;
C36 G21 S113 S374 S364 ;
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C37 G11 S111 S358 ;
C38 F32 S375 S418 S419 S377 S418 ;
C39 F32 S418 S420 S419 S378 S420 ;
C40 F32 S420 S421 S419 S337 S421 ;
C41 F32 S421 S422 S419 S379 S422 ;
C42 F32 S422 S423 S419 S380 S423 ;
C43 F32 S423 S424 S419 S381 S424 ;
C44 G12 S376 U6 S419 ;
C45 F32 S98 S342 S382 S383 U7 ;
C46 F32 S339 S383 S99 S385 S386 ;
C47 F32 S94 U8 S387 S388 U9 ;
C48 F32 S95 S388 S390 S340 S391 ;
C49 F32 S101 S342 S392 S393 S394 ;
C50 F32 S395 S396 S390 S397 S398 ;
C51 F32 S339 S385 S390 S395 S399 ;
C52 F32 S339 S400 S401 U10 S400 ;
C53 F32 S400 S403 S401 U11 S403 ;
C54 F32 S403 U12 S401 S341 U13 ;
C55 G21 S395 S390 S382 ;
C56 G21 S340 S390 S387 ;
C57 G21 S406 S390 S392 ;
C58 G21 S341 S346 S407 ;
C59 G21 S98 S407 S408 ;
C60 G21 S101 S409 S406 ;
C61 G21 S385 S394 S347 ;
C62 G21 S342 S339 S375 ;
C63 G21 S397 S393 S396 ;
C64 G31 S340 S343 S347 S128 ;
C65 G41 S342 S96 S131 S95 S130 ;
C66 G41 S393 S344 S397 S394 S410 ;
C67 G31 S411 S399 S386 S376 ;
C68 G31 S381 S398 S412 S413 ;
C69 G31 S398 S393 S100 S414 ;
C70 G31 S415 S410 S408 S129 ;
C71 G31 S377 S378 S337 S412 ;
C72 G31 S416 S413 S414 S415 ;
C73 G12 S97 S390 S411 ;
C74 G11 S340 S338 ;
C75 G41 S381 S379 S412 S96 S416 ;
C76 G11 S380 S409 ;
C77 G12 S376 U14 S401 ;
C78 F32 S426 U15 S427 S136 S428 ;
C79 F32 S338 S429 S430 S431 S432 ;
C80 F32 S121 S433 S434 S435 S436 ;
C81 F32 S142 U16 S437 S438 S439 ;
C82 F32 S121 S440 S441 S442 S443 ;
C83 G31 S135 S428 S444 S138 ;
C84 G21 S135 S444 S426 ;
C85 G11 S426 S445 ;
C86 G21 S338 S112 S427 ;
C87 G21 S444 S112 S430 ;
C88 G21 S112 S443 S437 ;
C89 G21 S428 S94 S137 ;
C90 G21 S117 S439 S440 ;
C91 G31 S117 S432 S438 S433 ;
C92 G21 S446 S119 S145 ;
C93 G21 S446 S116 S86 ;
C94 G21 S436 S443 S447 ;
C95 G41 S447 S117 S127 S120 S140 ;
C96 G31 S120 S118 S116 S448 ;
C97 G21 S432 S439 S139 ;
C98 G31 S121 S431 S112 S434 ;
C99 G31 S121 S438 S112 S441 ;
C100 G21 S442 S448 S141 ;
C101 G21 S345 S347 S142 ;
C102 G11 S449 S143 ;
C103 G11 S449 S144 ;
C104 G21 S117 S118 S446 ;
C105 G21 S145 S442 S450 ;

C106 F22 U17 S450 S451 U18 ;
C107 F22 U19 S451 S453 U20 ;
C108 F22 U21 S453 S449 U22 ;
C109 G21 S133 S125 S429 ;
C110 G21 S445 S112 S456 ;
C111 F32 S338 S457 S456 S458 U23 ;
C112 G21 S435 S458 S444 ;
C113 G21 S133 S124 S457 ;
C114 G12 S90 U24 S339 ;
C115 F42 S349 U25 S350 S93 U26 S147 ;
C116 G11 S126 S349 ;
C117 F42 S349 U27 S113 S93 U28 S148 ;
C118 F32 S149 U29 S353 S354 U30 ;
C119 F32 S339 S354 S111 S356 S350 ;
C120 G21 S112 S350 S353 ;
C121 G21 S151 S150 S460 ;
C122 G21 S151 S154 S461 ;
C123 G21 S150 S155 S462 ;
C124 G21 S154 S155 S463 ;
C125 G21 S153 S156 S464 ;
C126 G21 S152 S102 S465 ;
C127 G21 S102 S156 S466 ;
C128 G21 S124 S158 S165 ;
C129 G21 S102 S156 S467 ;
C130 G21 S462 S464 S468 ;
C131 G21 S469 S167 S166 ;
C132 G31 S157 S463 S466 S470 ;
C133 G31 S465 S460 S471 S472 ;
C134 G31 S472 S166 S93 S167 ;
C135 G31 S465 S461 S471 S469 ;
C136 G31 S465 S462 S471 S169 ;
C137 G31 S465 S463 S471 S168 ;
C138 G31 S158 S115 S106 S471 ;
C139 G41 S467 S473 S470 S474 S475 ;
C140 G21 S107 S468 S473 ;
C141 G21 S475 S106 S476 ;
C142 G31 S158 S477 S92 S478 ;
C143 G21 S479 S149 S480 ;
C144 G31 S463 S466 S157 S474 ;
C145 G31 S480 S160 S129 S481 ;
C146 F32 S481 U31 S478 S113 S163 ;
C147 G21 S153 S477 S125 ;
C148 G41 S461 S152 S106 S115 S477 ;
C149 G31 S476 S482 S483 S479 ;
C150 G11 S470 S103 ;
C151 G11 S478 S164 ;
C152 F32 S162 S159 S111 U32 S482 ;
C153 G31 S485 S154 S153 S486 ;
C154 G21 S486 S106 S487 ;
C155 G21 S487 S106 S488 ;
C156 G31 S488 S161 S107 S483 ;
C157 G11 S479 S115 ;
C158 G21 S152 S157 S485 ;
C159 F32 S481 U33 S111 U34 S123 ;
C160 G11 S125 S124 ;
C161 G12 S92 U35 S501 ;
C162 F32 S510 S170 S511 S512 U36 ;
C163 F32 S510 S514 S515 S516 U37 ;
C164 F32 S510 S516 S515 S518 U38 ;
C165 F32 S510 S518 S515 U39 S514 ;
C166 F32 S510 S518 S511 U40 S522 ;
C167 F32 S510 S523 S511 S502 U41 ;
C168 F32 S525 S170 S511 S523 U42 ;
C169 F32 S525 S527 S528 S529 U43 ;
C170 F32 S525 S529 S528 S531 U44 ;
C171 F32 S525 S531 S528 U45 S527 ;
C172 F32 S525 S531 S511 U46 S535 ;
C173 G21 S512 S523 S536 ;
C174 G21 S536 S511 S537 ;

C175 G21 S522 S535 S503 ;
C176 G12 S88 S538 S539 ;
C177 G11 S538 S525 ;
C178 G11 S539 S510 ;
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C180 G12 S537 U48 S515 ;
C181 G12 S537 U49 S528 ;
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C189 F32 S543 S557 S544 S559 S560 ;
C190 F32 S543 S559 S544 S561 S562 ;
C191 F32 S543 S561 S544 S563 S564 ;
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C196 G31 S553 S569 S506 S570 ;
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C198 G21 S547 S545 S571 ;
C199 G41 S565 S567 S509 S571 S572 ;
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C201 G21 S572 S573 S507 ;
C202 G11 S572 S508 ;
C203 G12 S501 U52 S544 ;
C204 G11 S552 S506 ;
C205 G31 S570 S549 S544 S504 ;
C206 G31 S555 S550 S570 S505 ;
C207 G12 S503 U53 S569 ;
C208 G11 S569 S543 ;
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