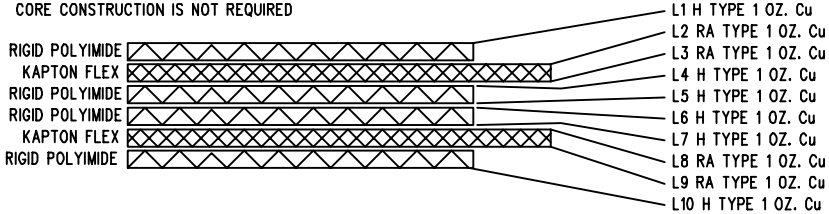
FREELEFT13.pcb - Tue Aug 05 12:08:11 2003

FABRICATION NOTES

1. FABRICATE PER IPC 6013 TYPE 4 CLASS 3 COUPONS AND C OF C TO BE DELIVERED WITH BOARDS
2. MATERIAL TYPE POLYIMIDE RIGID/KAPTON FLEX PER IPC-4101/40 AND IPC-FC-241
3. FINISHED RIGID THICKNESS .062" +/-.007" , FLEX THICKNESS .010" +/-.003" OVER COVER FILM
4. COVER FILM REQUIRED FOR FLEX AREAS BOTH SIDES PER IPC-FC-232 .001" ADHESIVE/.001" KAPTON MINIMUM
5. BOARD FINISH HASL SMOBC
6. ALL MASTER ARTWORKS ARE VIEWED THRU COMPONENT SIDE
7. LAY-UP OF LAYERS TO BE AS MARKED ON MASTER ARTWORKS
   LAYER 1 -PRIMARY COMPONENT SIDE THRU LAYER 10 -SECONDARY COMPONENT SIDE
8. MINIMUM DIELECTRIC THICKNESS SHALL BE .0035" 2 PLY IN RIGID AREAS
9. EXPOSED WEAVE IS PROHIBITED
10. PINK RING IS PROHIBITED
11. NEGATIVE ETCHBACK IS PROHIBITED
12. MINIMUM LINE WIDTH .0065" SPACING .0065"
13. MINIMUM ANNULAR RING INTERNAL .002" EXTERNAL .005"
14. DRILL BREAKOUT IS PROHIBITED
15. BOW AND TWIST OF RIGID SECTIONS .5% MAXIMUM
16. LIFTED LANDS IN EXCESS OF .001" AFTER THERMAL STRESS TEST ARE PROHIBITED
17. SOLDERMASK BOTH SIDES USING LPI TYPE MASK COLOR GREEN THAT MEETS
    NASA OUTGASSING REQUIREMENTS OF TML < 1.0% AND CVCM <.01%
18. SILKSCREEN BOTH SIDES PER MIL-I-43553 COLOR WHITE
19. ALL DIMENSIONS ARE IN INCHES TOLERANCE +/- .005 UNLESS OTHERWISE NOTED
20. ALL SIZES LISTED IN THE DRILL SYMBOL CHART ARE IN THOUSANDTHS
    OF AN INCH AND ARE FINISHED DIAMETERS AFTER PLATING.
    HOLE SIZE TOLERANCE +/- .003" UNLESS OTHERWISE NOTED
21. RADIUS ALL CORNERS .062" UNLESS OTHERWISE NOTED
22. 100% NETLIST TESTING IS REQUIRED
23. VENDOR IS RESPONSIBLE FOR DFM AUDIT FOR COMPLIANCE WITH IPC-6103 AND THESE NOTES
24. VENDOR TO PERFORM 100% VISUAL INSPECTION FOR COMPLIANCE TO IPC-6013 AND THESE NOTES
25. VENDOR SHALL PERFORM DIELECTRIC WITHSTANDING VOLTAGE AND MOISTURE INSULATION RESISTANCE TEST
    PER IPC-6013 FOR THE BOARD LOT
26. VENDOR IS RESPONSIBLE TO READ ALL NOTES AND COMPLY WITH ALL SPECIFICATIONS
    SEE NOTES 1 THROUGH 25

STACK-UP TO BE SYMMETRICAL WITH UNIFORM DIELECTRIC SEPARATION
CORE CONSTRUCTION IS NOT REQUIRED



REVISION				
SYM	ZONE	DESCRIPTION	DATE	APPROVAL

SIZE	QTY	SYM	PLTD
13	1552	+	PLTD
32	146	×	PLTD
40	165	□	PLTD
62	4	◇	NPLTD
96	8	⧖	NPLTD
129	12	⋈	NPLTD

FABRICATION NOTES

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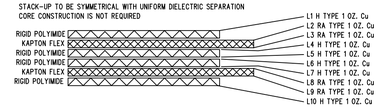
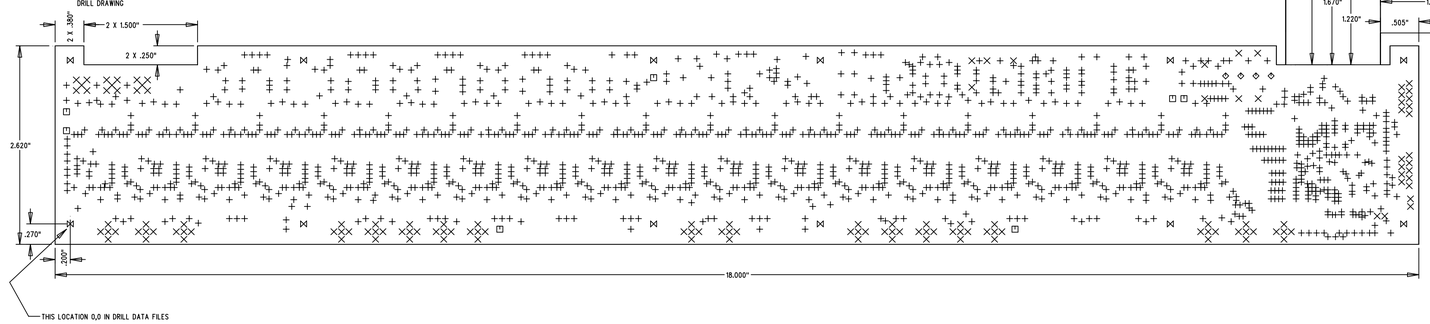
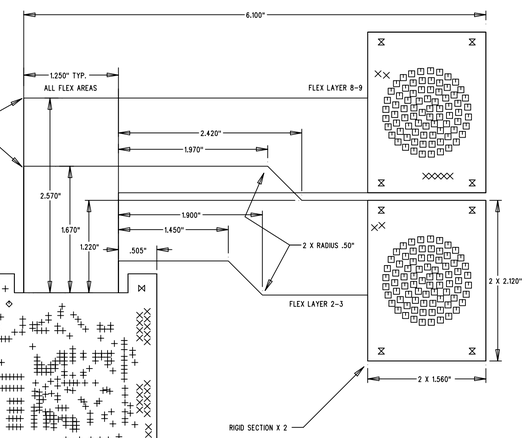
    PER IPC-6013 FOR THE BOARD LOT
26. VENDOR IS RESPONSIBLE TO READ ALL NOTES AND COMPLY WITH ALL SPECIFICATIONS
    SEE NOTES 1 THROUGH 25

STACK-UP TO BE SYMMETRICAL WITH UNIFORM DIELECTRIC SEPARATION
CORE CONSTRUCTION IS NOT REQUIRED



NETLIST UPDATED 7/31/03
GLAST FRONT END EVENT LEFT SIDE BOARD 4/25/03 PWB 2054516 REV -
DRILL DRAWING





ITEM NO.	REQD	REQD	PART NO.	DESCRIPTION	MATERIAL	MATERIAL SPEC	& NO.
				LIST OF MATERIALS			

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES
.XX +/-.01 .XXX +/-.005 +/-.1 FRACTIONS +/-1/16 125
REMOVE ALL BURRS AND SHARP EDGES R OR CHAMFER .010 MAX.

☐ FLIGHT HARDWARE
☐ HARDNESS TEST NOT REQUIRED ☐ NON-FLIGHT
☐ TEST HARDNESS PER ASTM E-18, LOCATION OPTIONAL
☐ TEST HARDNESS PER ASTM E-18, WHERE INDICATED ON FIELD OF DRAWING THIS ⊕
☐ NO NON-DESTRUCTIVE EXAMINATION (NDE) REQD
☐ NDE REQUIRED PER S-310-009 CODE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
GODDARD SPACE FLIGHT CENTER GREENBELT, MARYLAND

NAME	INIT	DATE
DESIGNER P. GOODWIN		
DRAWN P. GOODWIN		
CHECKED		
APPROVED		
APPROVED		
APPROVED-STRESS		
APPROVED-ENGINEER		

DRAWING INTERPRETED PER GSFC-X673-64-1

TITLE
GLAST FRONT END EVENT
LEFT SIDE BOARD
DRILL DRAWING

GJ 2054516 REV -
CODE SCALE 2:1 WT SH 1 OF 1

PLOT DATE	8/1/03
THIS DRAWING WAS PRODUCED USING	
SOFTWARE PADS-POWERPCB VERSION 5.0.1	
FILE NAME	
BOARD DATABASE FREELEFT13.PCB	

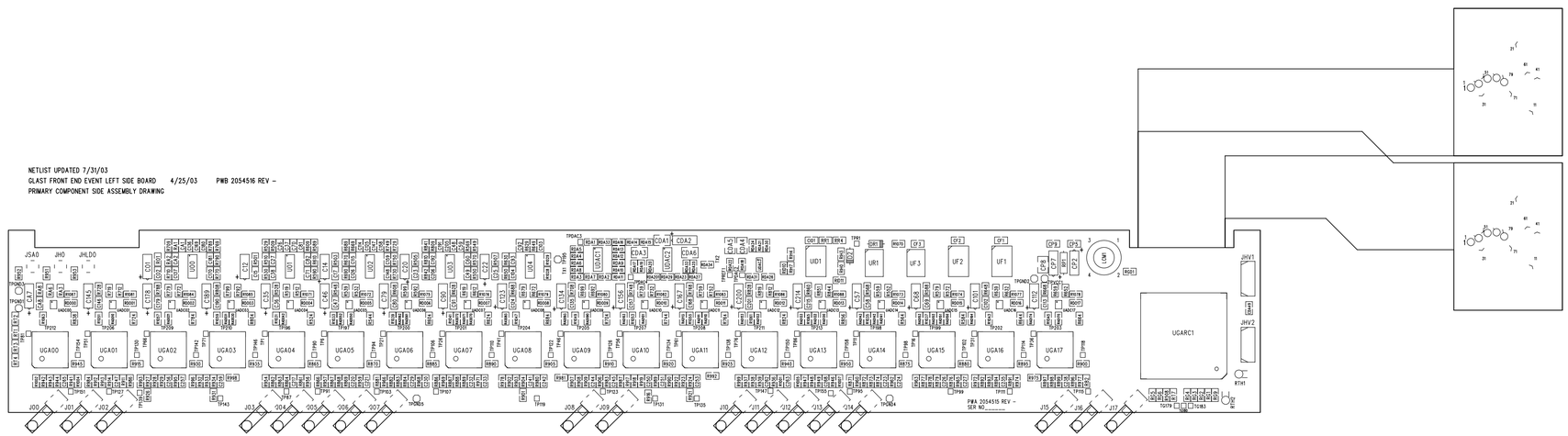
2054516	GLAST ACD
NEXT ASSY	USED ON

FSCM NO. 2054516 SIZE B REV -

FREELEFT13.pcb - Wed Aug 06 13:38:02 2003

REVISION				
SYM	ZONE	DESCRIPTION	DATE	APPROVAL

NETLIST UPDATED 7/31/03
GLAST FRONT END EVENT LEFT SIDE BOARD 4/25/03 PWB 2054516 REV -
PRIMARY COMPONENT SIDE ASSEMBLY DRAWING



ITEM NO.	REQD	REQD	PART NO.	DESCRIPTION	MATERIAL	MATERIAL SPEC	& NO.

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES
.XX .XXX FRACTIONS 1/2
+/-.01 +/-.005 +/-.1 +/-1/16
REMOVE ALL BURRS AND SHARP EDGES R OR CHAMFER .010 MAX.

☐ FLIGHT HARDWARE
☐ HARDNESS TEST NOT REQUIRED ☐ NON-FLIGHT
☐ TEST HARDNESS PER ASTM E-18, LOCATION OPTIONAL
☐ TEST HARDNESS PER ASTM E-18, WHERE INDICATED ON FIELD OF DRAWING THIS ⊕

☐ NO NON-DESTRUCTIVE EXAMINATION (NDE) REQD
☐ NDE REQUIRED PER S-313-009 CODE

PLOT DATE	8/1/03
THIS DRAWING WAS PRODUCED USING	
SOFTWARE	PADS-POWERPCB VERSION 5.0.1
FILE NAME	
BOARD DATABASE	FREELEFT13.PCB

2054529-3	GLAST ACD
NEXT ASSY	USED ON

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION — GODDARD SPACE FLIGHT CENTER — GREENBELT, MARYLAND

NAME	INT	DATE
DESIGNER P. GOODWIN		
DRAWN P. GOODWIN		
CHECKED		
APPROVED		
APPROVED		
APPROVED-STRESS		
APPROVED-ENGINEER		

DRAWING INTERPRETED PER GSFC-1873-64-1

TITLE
GLAST FRONT END EVENT
LEFT SIDE BOARD
ASSEMBLY DRAWING

CODE	SCALE	WT	SH	REV
GJ	2054515			-
	2:1		1 OF 2	

FILED LINE

REV 1 GJ 2054515

REVISION				
ITM	ZONE	DESCRIPTION	DATE	APPROVAL

SECONDARY COMPONENT SIDE ASSEMBLY DRAWING
GLAST FRONT END EVENT LEFT SIDE BOARD 4/25/03 PWB 2054515 REV –
METLIST UPDATED 7/31/03

ITEM NO.	REQD	REQD	PART NO.	DESCRIPTION	MATERIAL	MATERIAL SPEC	& NO.

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES .XX +/-.01 .XXX +/-.005 FRACTIONS +/-1/16 .123
REMOVE ALL BURRS AND SHARP EDGES & OR CHAMFER .010 MAX.

- ☐ FLIGHT HARDWARE
- ☐ HARDNESS TEST NOT REQUIRED ☐ NON-FLIGHT
- ☐ TEST HARDNESS PER ASTM E-18, LOCATION OPTIONAL
- ☐ TEST HARDNESS PER ASTM E-18, WHERE INDICATED ON FIELD OF DRAWING THIS ⊕
- ☐ NO NON-DESTRUCTIVE EXAMINATION (NDE) REQD
- ☐ NDE REQUIRED PER S-313-009 CODE

PLOT DATE	8/1/03
THIS DRAWING WAS PRODUCED USING	
SOFTWARE	PADS-POWERPCB VERSION 5.0.1
FILE NAME	
BOARD DATABASE	FREELEFT10.PCB

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION GODDARD SPACE FLIGHT CENTER GREENBELT, MARYLAND

NAME	INIT	DATE
DESIGNED K. GOODWIN		
DRAWN K. GOODWIN		
CHECKED		
APPROVED		
APPROVED		
APPROVED-STRESS		
APPROVED-ENGINEER		

DRAWING INTERPRETED PER GSFC-X673-64-1

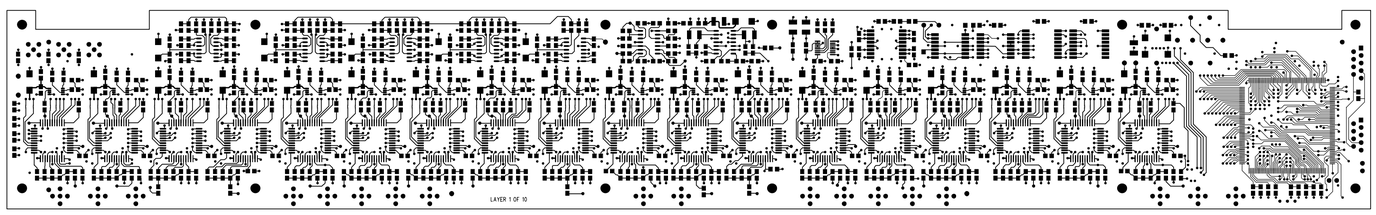
TITLE
GLAST FRONT END EVENT
LEFT SIDE BOARD
ASSEMBLY DRAWING

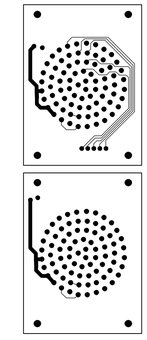
2054520-3	GLAST ACD	GJ	2054515
NEXT ASSY	USED ON	CODE	SCALE 2:1 WT SH 1 OF 2

REV –

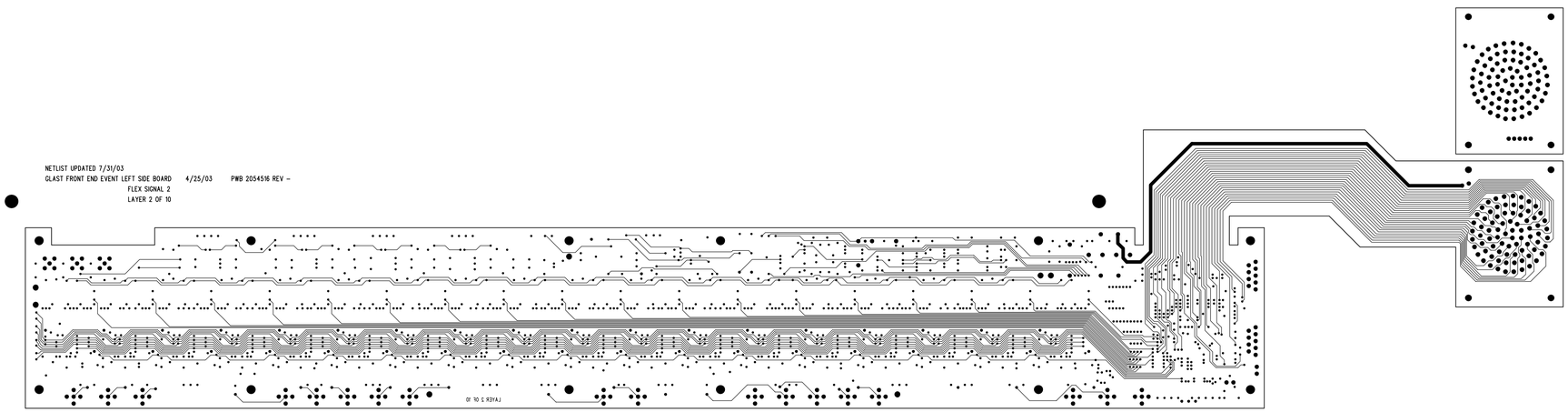
FIELD NAME GJ 2054515 REV – SH 1

NETLIST UPDATED 7/31/03
GLAST FRONT END EVENT LEFT SIDE BOARD 4/25/03 PWB 2054516 REV –
PRIMARY COMPONENT SIDE
LAYER 1 OF 10





NETLIST UPDATED 7/31/03
GLAST FRONT END EVENT LEFT SIDE BOARD 4/25/03 PWB 2054516 REV –
FLEX SIGNAL 2
LAYER 2 OF 10

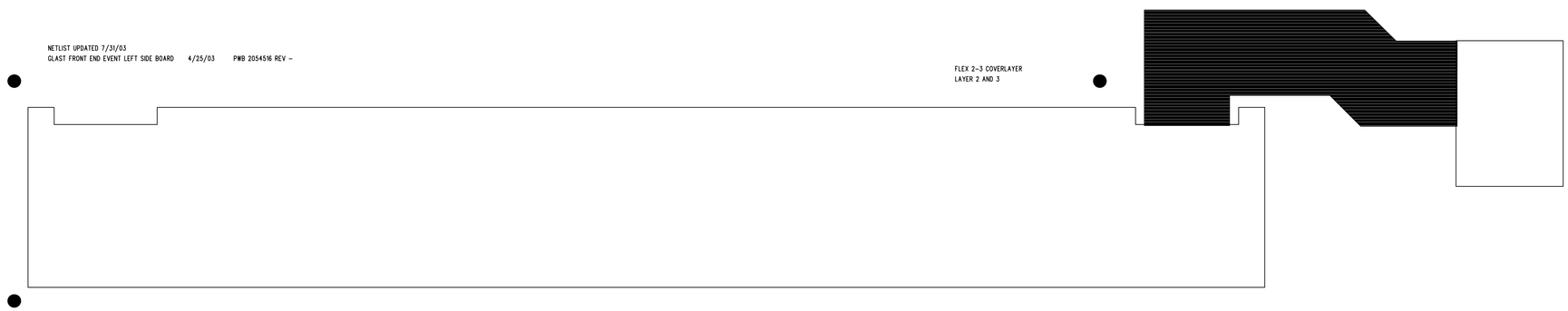


art002.pho – Wed Aug 06 15:06:05 2003

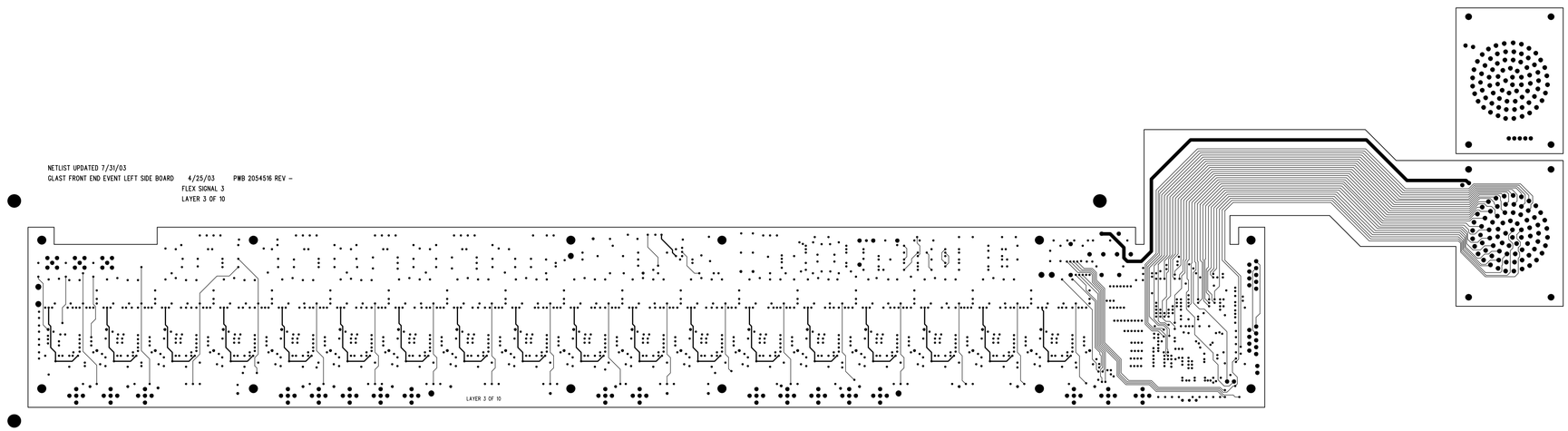
COVERLAY23.pho - Wed Aug 06 15:08:16 2003

NETLIST UPDATED 7/31/03
GLAST FRONT END EVENT LEFT SIDE BOARD 4/25/03 PWB 2054516 REV -

FLEX 2-3 COVERLAYER
LAYER 2 AND 3



NETLIST UPDATED 7/31/03
GLAST FRONT END EVENT LEFT SIDE BOARD 4/25/03 PWB 2054516 REV –
FLEX SIGNAL 3
LAYER 3 OF 10



art003.pho – Wed Aug 06 15:06:34 2003

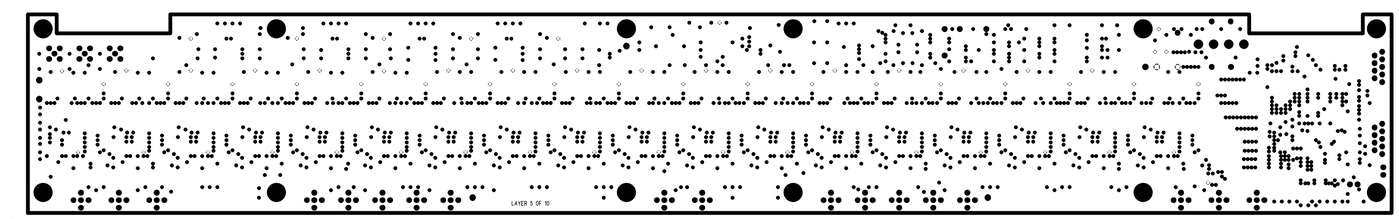
NETLIST UPDATED 7/31/03
GLAST FRONT END EVENT LEFT SIDE BOARD 4/25/03

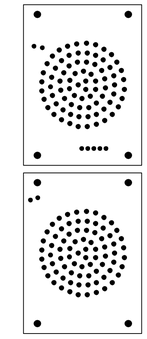
PWB 2054516 REV –
ANALOG GROUND PLANE
LAYER 4 OF 10

pgp004.pho – Wed Aug 06 15:09:07 2003

NETLIST UPDATED 7/31/03
GLAST FRONT END EVENT LEFT SIDE BOARD 4/25/03 PWB 2054516 REV –

VCC POWER PLANE
LAYER 5 OF 10

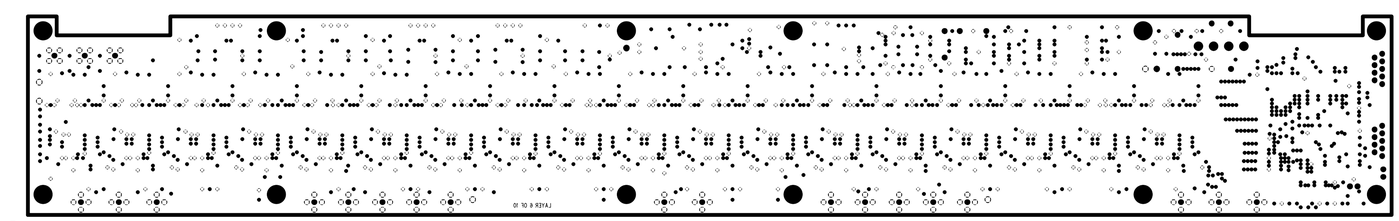


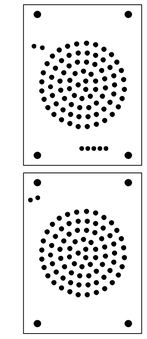


pgp005.pho – Wed Aug 06 15:09:26 2003

NETLIST UPDATED 7/31/03
GLAST FRONT END EVENT LEFT SIDE BOARD 4/25/03 PWB 2054516 REV –

ANALOG GROUND PLANE
LAYER 6 OF 10





pgp006.pho – Wed Aug 06 15:09:48 2003

NETLIST UPDATED 7/31/03
GLAST FRONT END EVENT LEFT SIDE BOARD 4/25/03 PWB 2054516 REV –

VDD POWER PLANE
LAYER 7 OF 10

pgp007.pho – Wed Aug 06 15:10:11 2003

NETLIST UPDATED 7/31/03
GLAST FRONT END EVENT LEFT SIDE BOARD 4/25/03 PWB 2054516 REV –

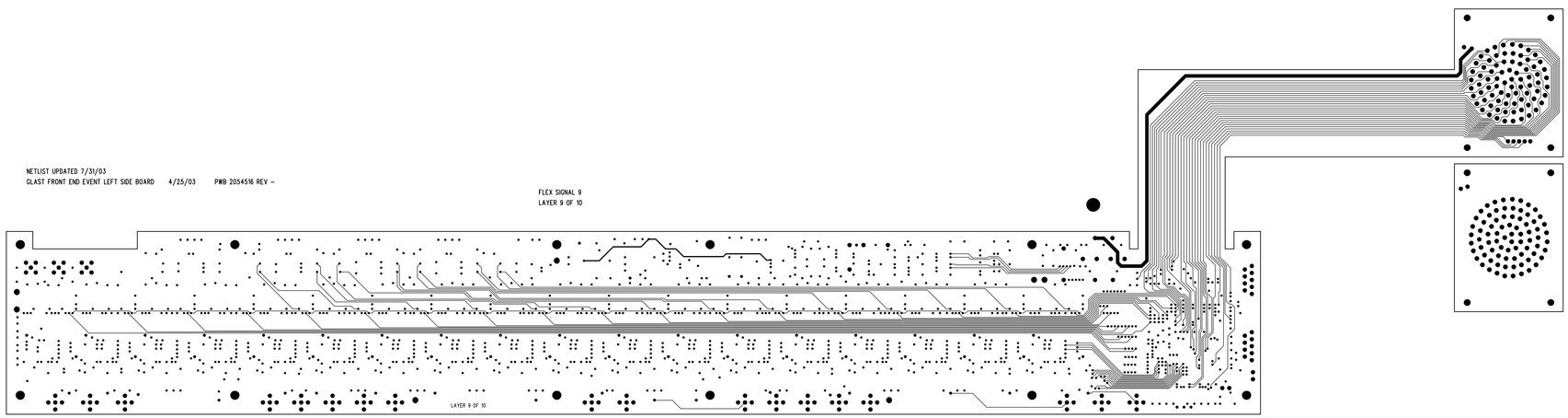
FLEX SIGNAL 8
LAYER 8 OF 10

art008.pho – Wed Aug 06 15:07:02 2003

art009.pho - Wed Aug 06 15:07:24 2003

NETLIST UPDATED 7/31/03
GLAST FRONT END EVENT LEFT SIDE BOARD 4/25/03 PWB 2054516 REV -

FLEX SIGNAL 9
LAYER 9 OF 10



COVERLAY89.pho - Wed Aug 06 15:08:39 2003

NETLIST UPDATED 7/31/03
GLAST FRONT END EVENT LEFT SIDE BOARD 4/25/03 PWB 2054516 REV -

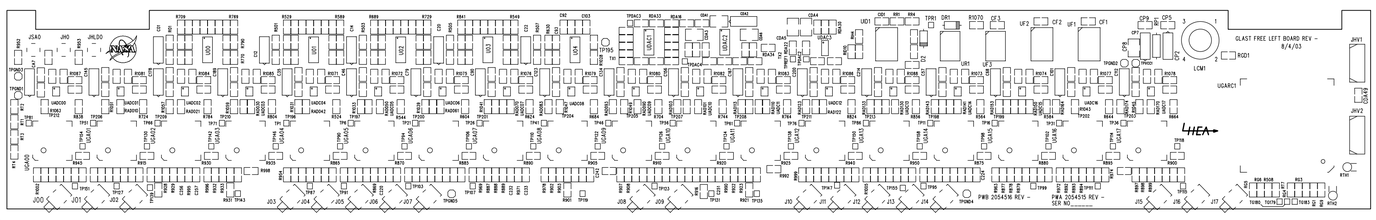
FLEX 8-9 COVERLAYER
LAYER 8 AND 9

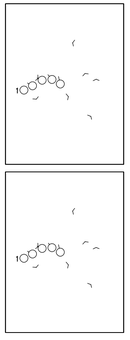
NETLIST UPDATED 7/31/03
GLAST FRONT END EVENT LEFT SIDE BOARD 4/25/03 PWB 2054516 REV –

SECONDARY COMPONENT SIDE
LAYER 10 OF 10

NETLIST UPDATED 7/31/03
GLAST FRONT END EVENT LEFT SIDE BOARD 4/25/03 PWB 2054516 REV –

PRIMARY COMPONENT SIDE SILKSCREEN
LAYER 1 OF 10



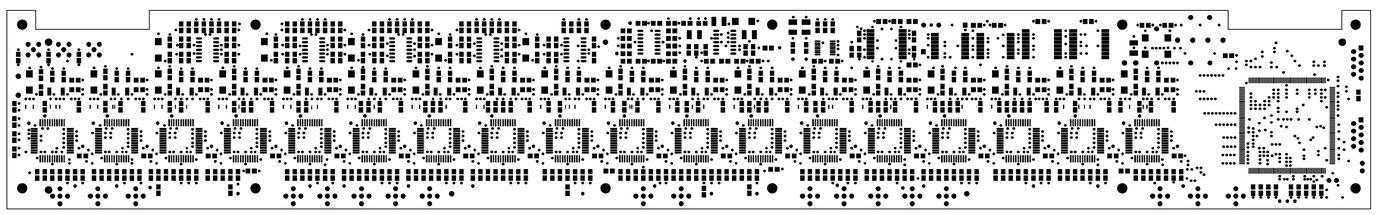


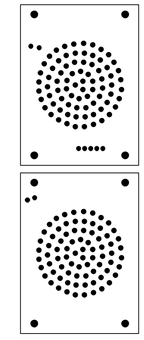
NETLIST UPDATED 7/31/03
GLAST FRONT END EVENT LEFT SIDE BOARD 4/25/03 PWB 2054516 REV -

SECONDARY COMPONENT SIDE SILKSCREEN
LAYER 10 OF 10

NETLIST UPDATED 7/31/03
GLAST FRONT END EVENT LEFT SIDE BOARD 4/25/03 PWB 2054516 REV –

PRIMARY COMPONENT SIDE SOLDERMASK
LAYER 1 OF 10

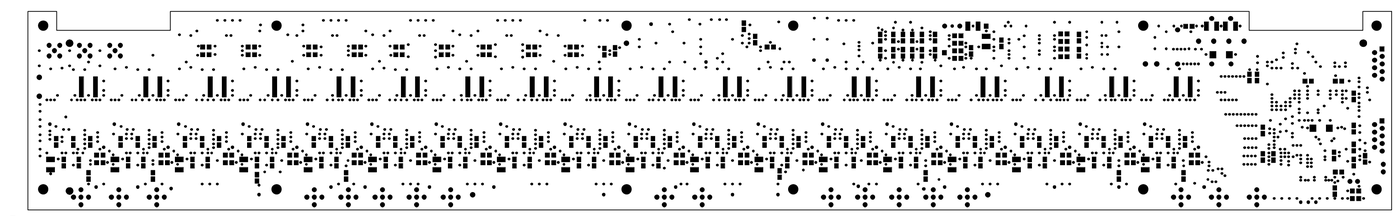


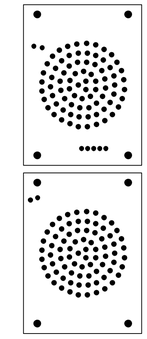


sm0010121.pho – Wed Aug 06 15:10:37 2003

NETLIST UPDATED 7/31/03
GLAST FRONT END EVENT LEFT SIDE BOARD 4/25/03 PWB 2054516 REV –

SECONDARY COMPONENT SIDE SOLDERMASK
LAYER 10 OF 10





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