

Service Manual

Model: ▲LTOCOMP

DIGITAL COMPRESSOR/LIMITER



www.altoproaudio.com

Version: 1.1

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1. SPECIFICATION (ALTOCOMP)

Analog Input section

Inputs: Analog variable gain, 2 XLR-F electronically balanced
Input Impedance: 44 kOhms
Max. input Level: 15 dBu (4.4V RMS)
Sensitivity: -22 dBu (63mV RMS)

Analog Output section

Outputs: Analog variable gain, 2 XLR-M electronically balanced
Output Impedance <150 Ohms
Max. output level: 17 dBu on 600 Ohms (5.5V RMS)

Digital / Analog Interface

Amplitude Response: 20 Hz - 20 kHz + 0.2 / - 2.5 dB
Signal to Noise Ratio: 90 dB (A wtg. / 20 Hz-20kHz)
THD+N: 0.03 % @ 1kHz -6 dB (VU-meter level)
Group Delay: 700 us
Sampling Frequency: 46.875 kHz
Conversion: 1 bit Sigma-Delta

Digital

Processor Speed: 12 MIPS
DSP Resolution: 24x32bits
Control: Microprocessor

MIDI Section

Connections: Input/Output/Thru
Sockets: 5-poles DIN (female)
Mode: Photocoupled

Power Supply

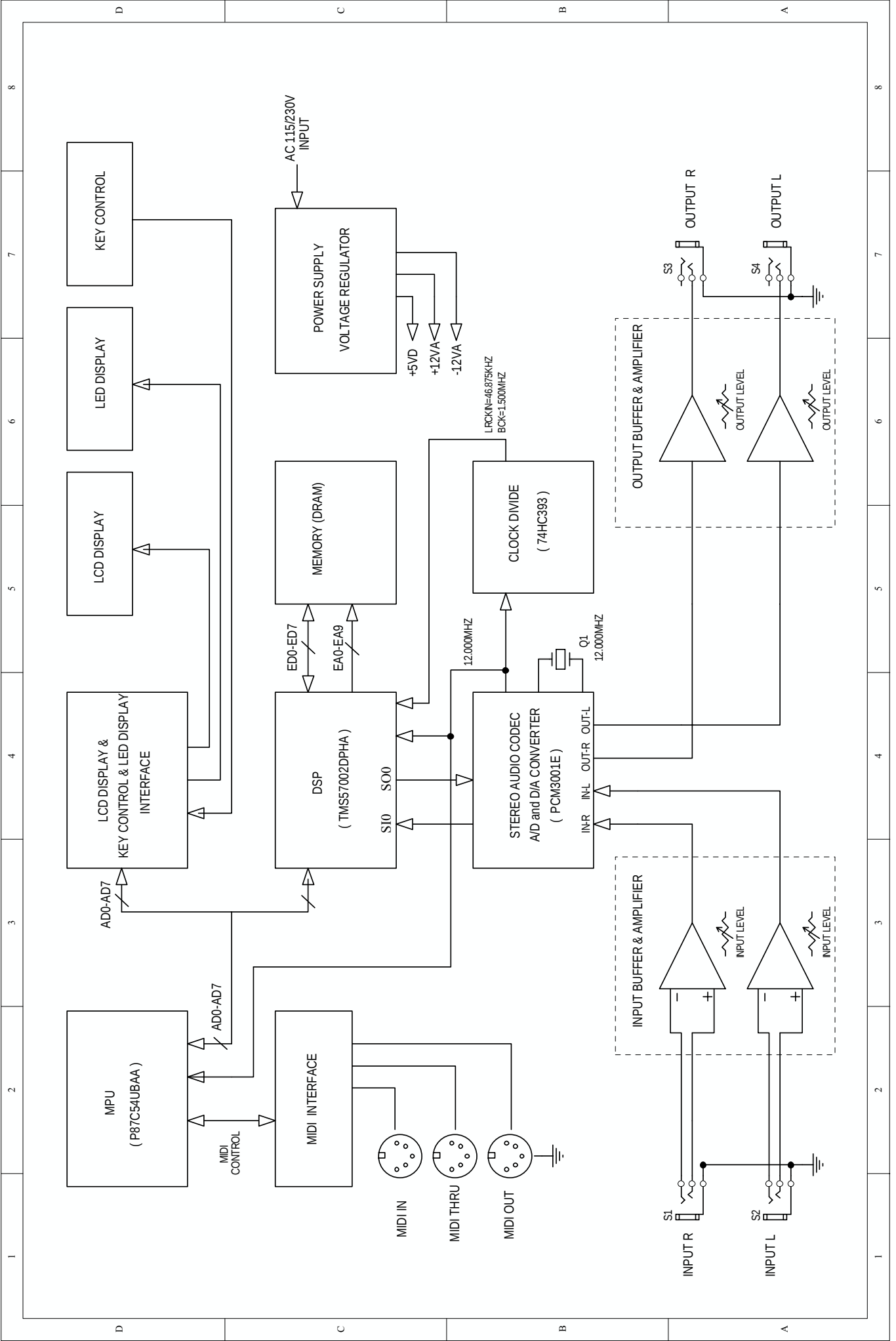
Connector type: 3-pole IEC, grounded
Type: Servo controlled, stabilized
Mains supply: 115V or 230V 50/60 Hz
Power Rating: 9 W

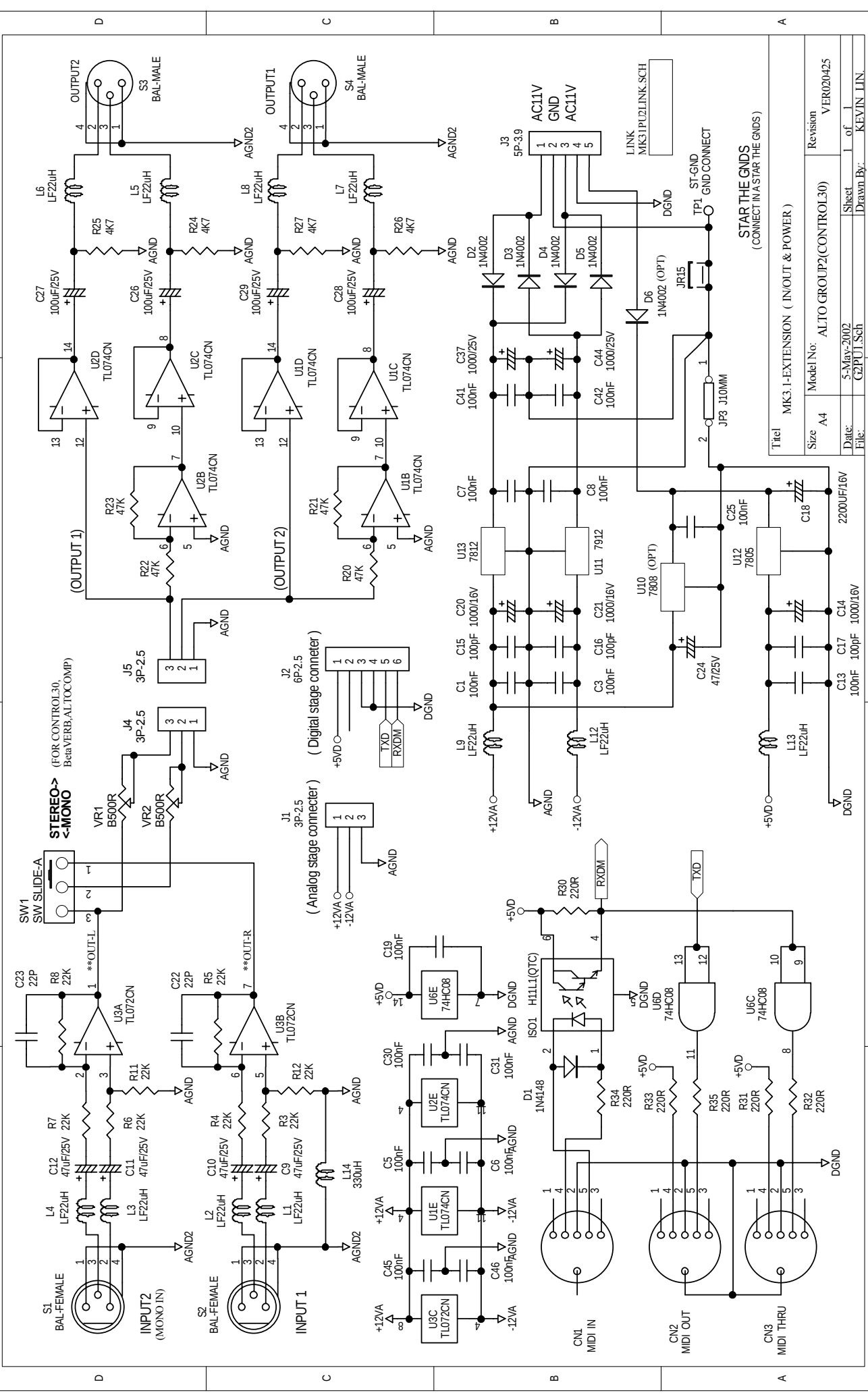
User Interface

numeric LCD Display: 2x20 characters
Keyboard: 7 user keys / 5 LEDs
VU meter: 2x6 LEDs

Physical

Size: Standard 19" rack mounting
Dimensions (W/H/D): 483mm 44mm 232.5mm (19.32" 1.76" 9.3")
Net Weight: 3.8Kg

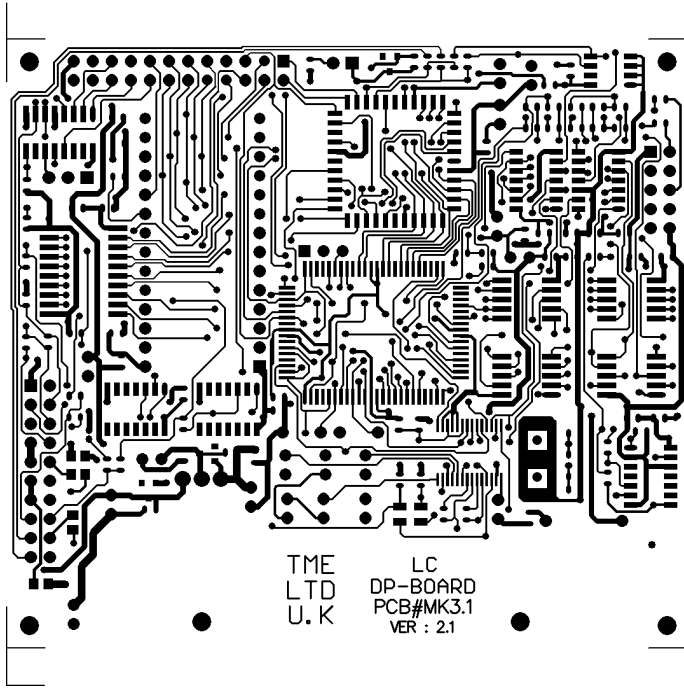




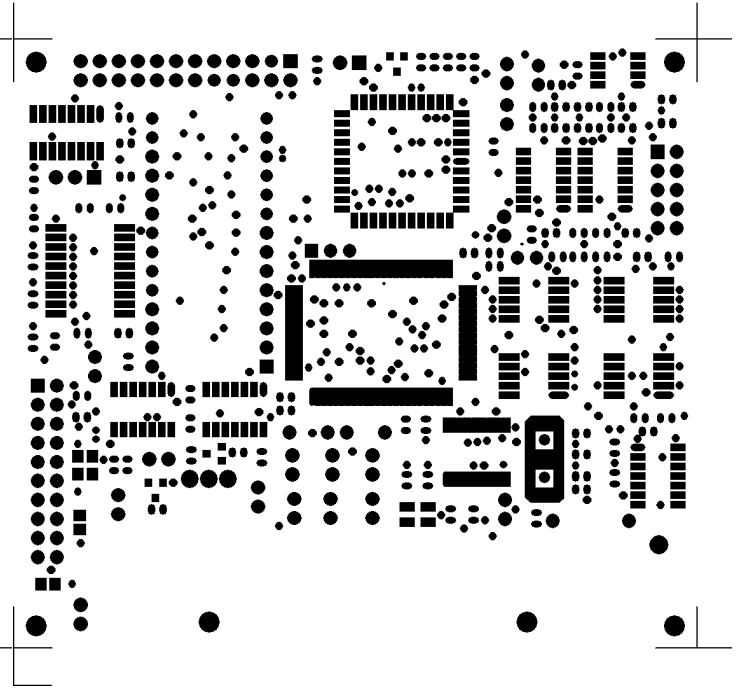
Title		MK3.1-EXTENSION (IN/OUT & POWER)	
Size	A4	Model No:	ALTO GROUP2(CONTROL30)
Date:	5-Mar-2002	Revision	VER020425
File:	C2PUT1.Sch	Sheet	of
		Drawn By:	KEY/JN L/JN

STAR THE GNDs
(CONNECT IN A STAR THE GNDs)

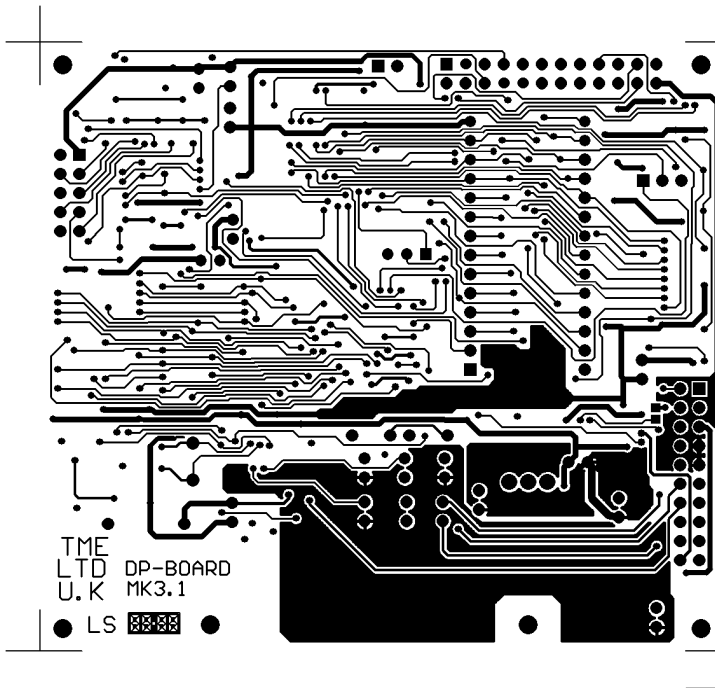
MK31 PCB LAYOUT



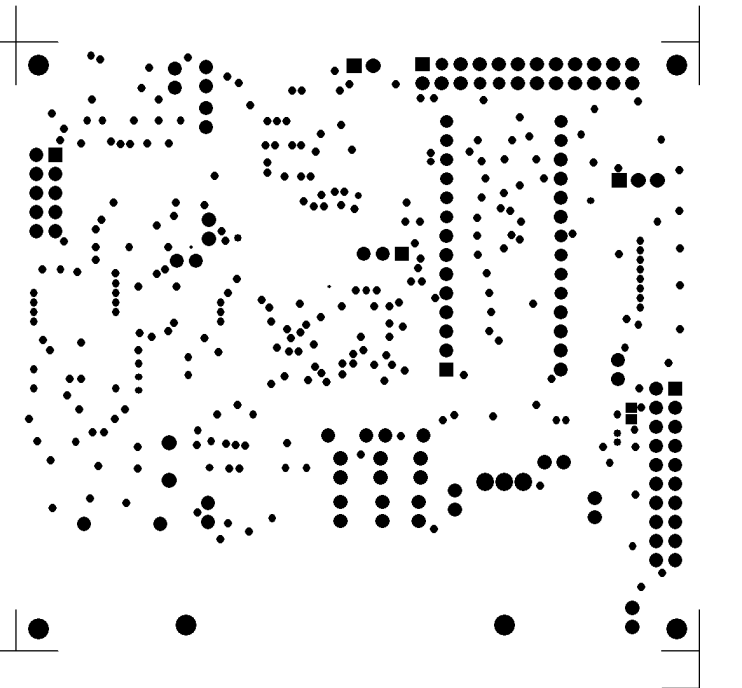
TOP LAYER



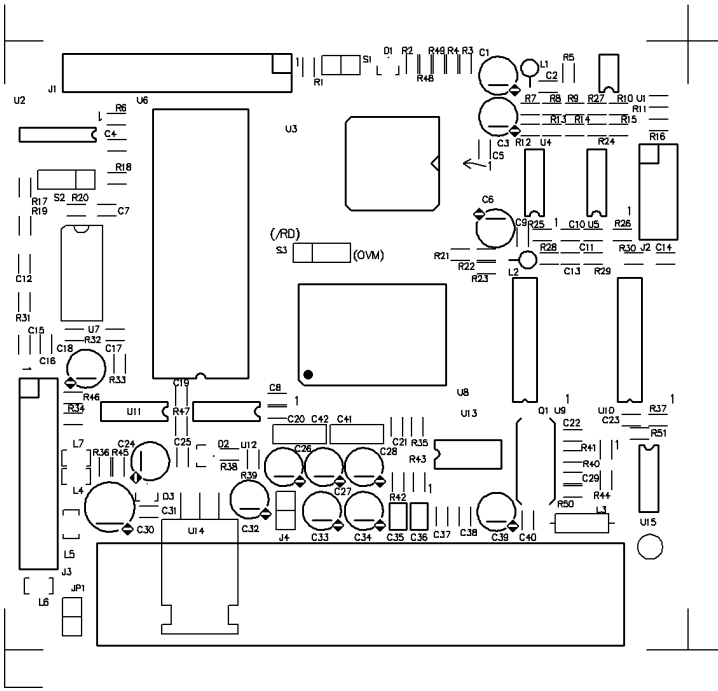
TOP SOLDER MASK



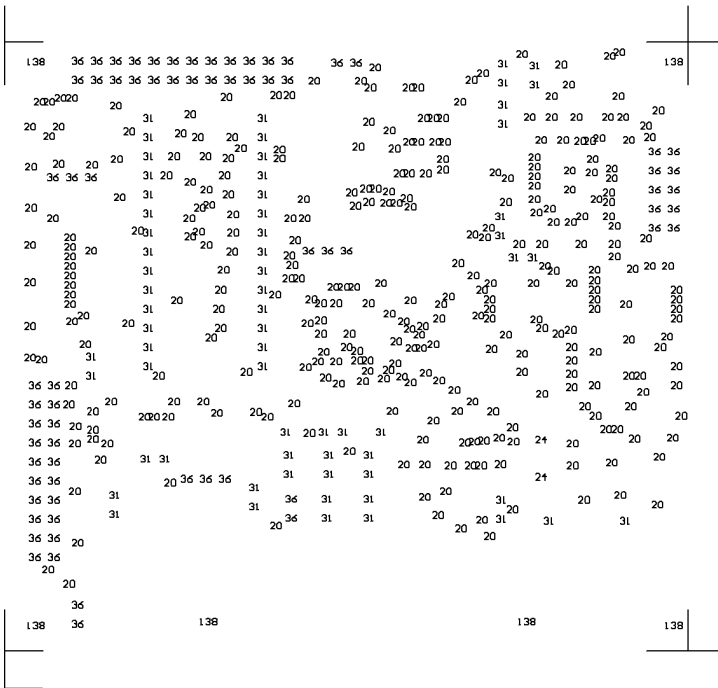
BOTTOM LAYER



BOTTOM SOLDER MASK



TOP SILKSCREEN



DRILL DRAWING

NCDrill File Report For: MK31-EMI.PCB

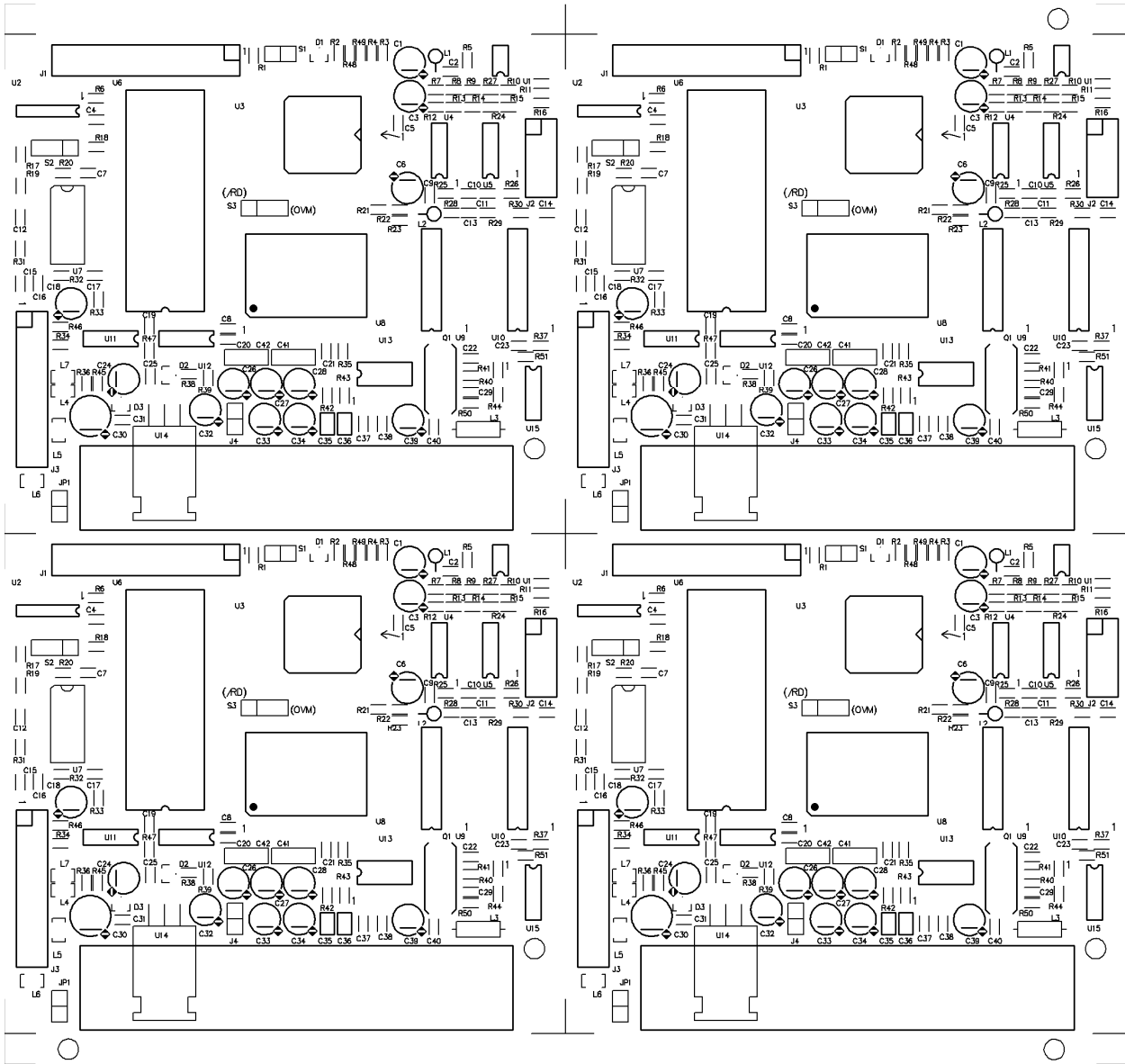
Layer Pair : TopLayer to BottomLayer

ASCII File : NCDrillOutput.TXT

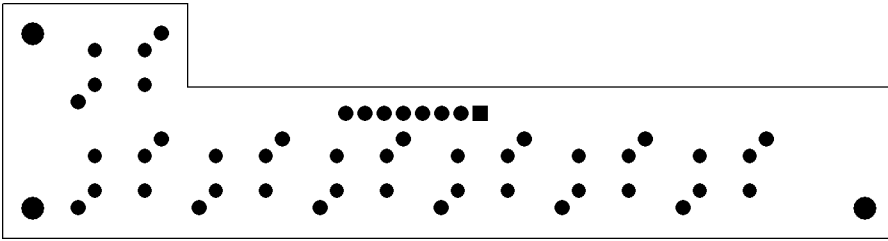
EIA File : NCDrillOutput.DRL

Tool	Hole Size	Hole Count Plated
T1	20mil (0.50mm)	328
T2	24mil (0.60mm)	2
T3	31mil (0.80mm)	64
T4	36mil (0.90mm)	69
T5	138mil (3.50mm)	6 NPTH
Totals		469

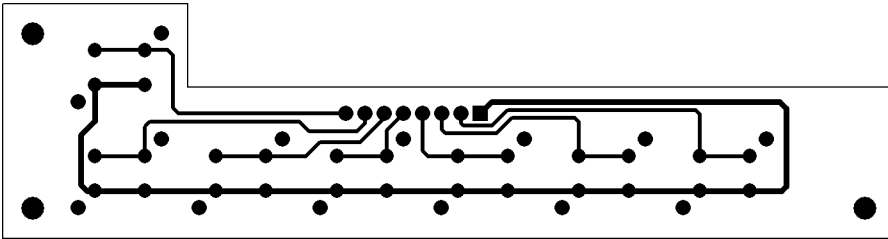
MK31 排片方式



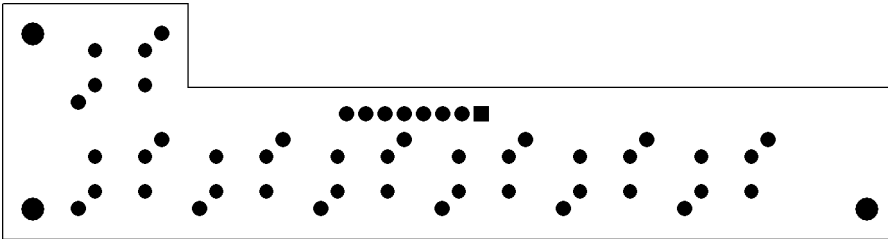
MK31-FDKB PCB LAYOUT



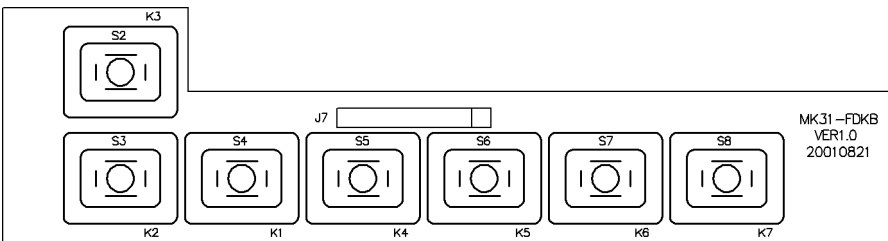
BOTTOM SOLDER MASK



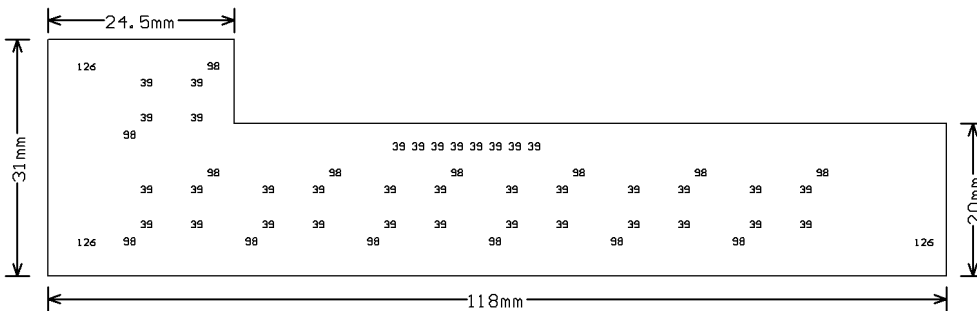
BOTTOM LAYER



TOP LAYER & TOP SOLDER MASK

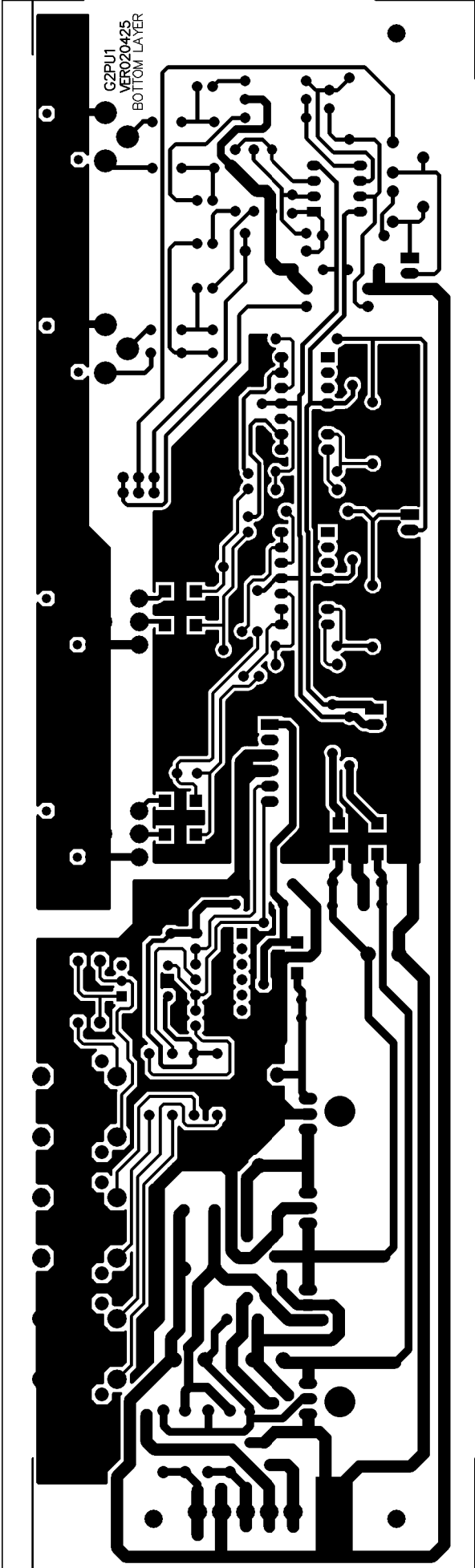


TOP SILKSCREEN

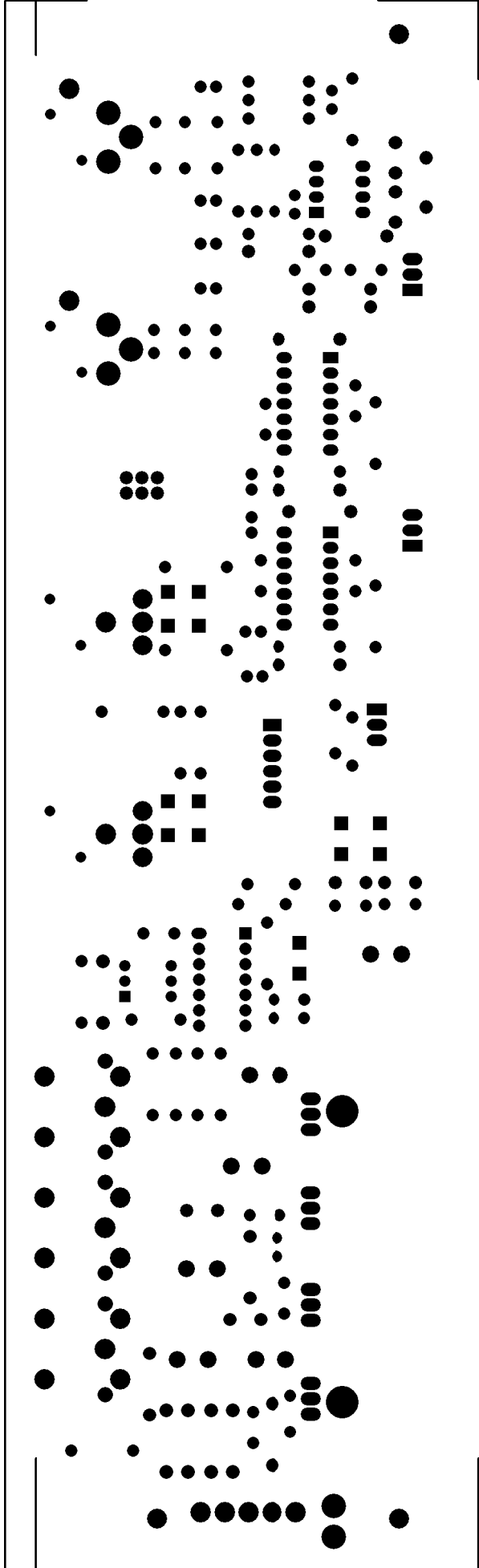


DRILL DRAWING

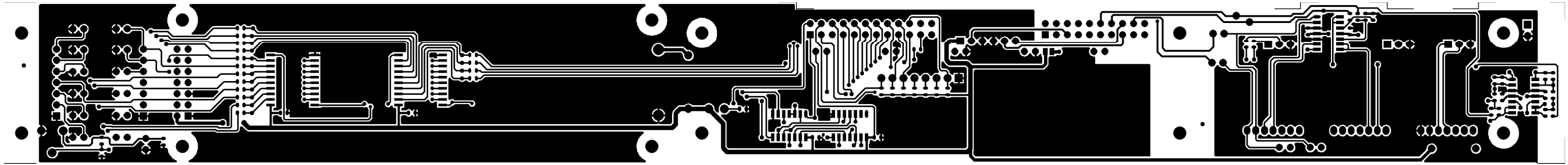
Tool	Hole Size	Hole Count	Plated
T1	39mil (1.00mm)	36	
T2	98mil (2.50mm)	14	NPTH
T3	126mil (3.20mm)	3	NPTH
Totals		53	



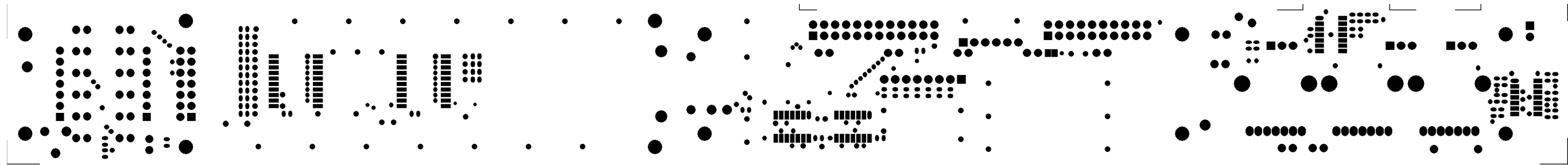
G2PU1 Solder Side



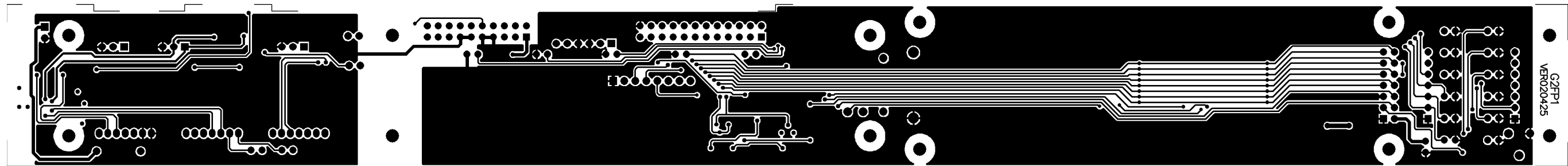
G2PU1 BottomSolderMask



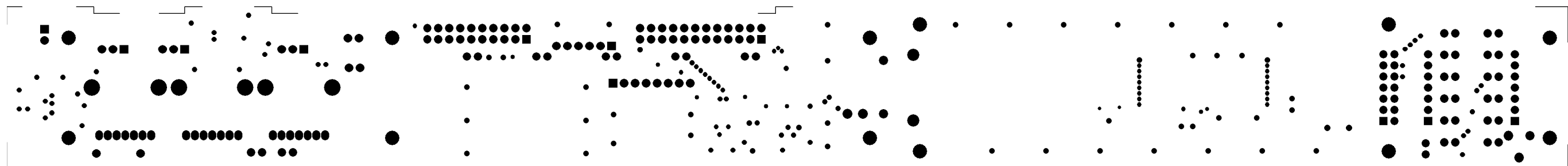
Top Layer



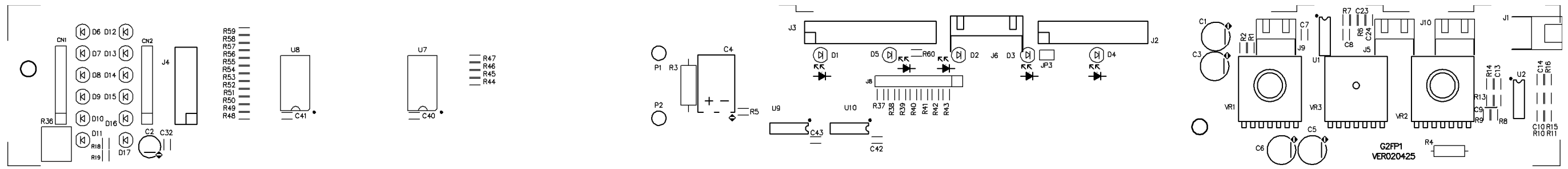
Top Solder Mask



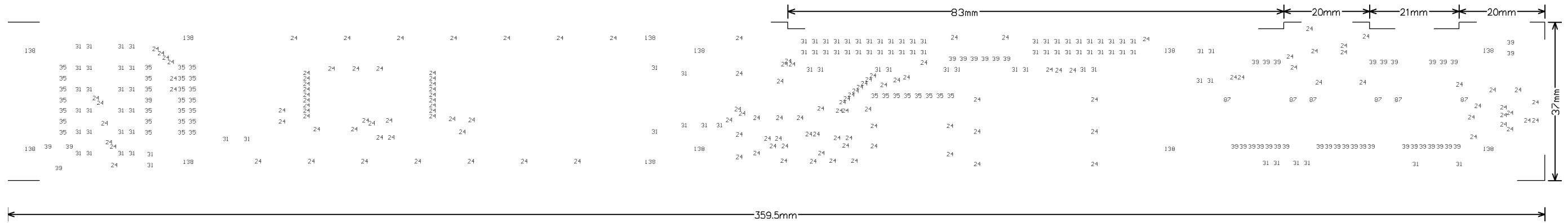
Bottom Layer



Bottom Solder



Top Overlay



Drill Drawing

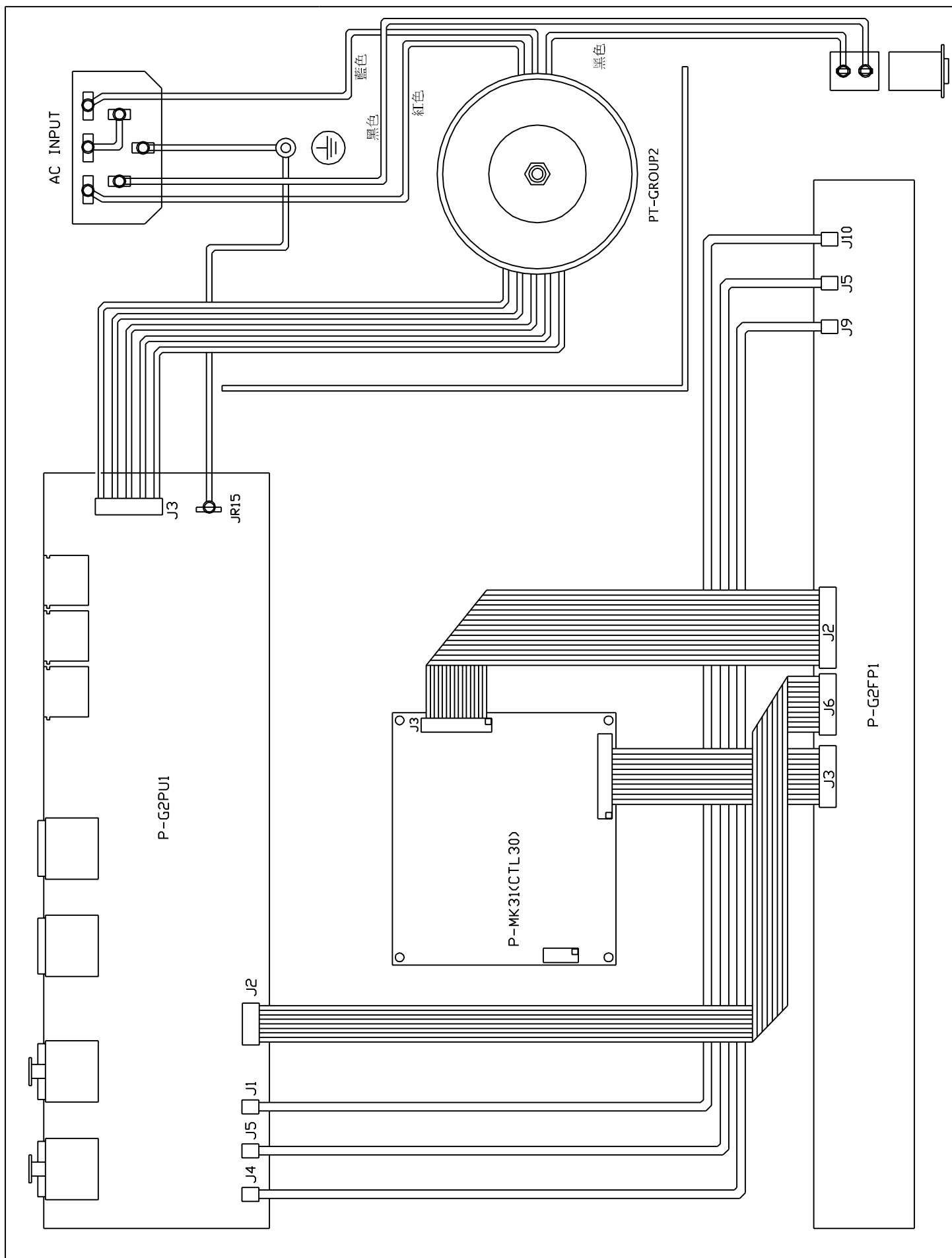
NCDrill File Report For: G2FP1.PCB 13-May-2002

Layer Pair : TopLayer to BottomLayer
 ASCII File : NCDrillOutput.TXT
 EIA File : NCDrillOutput.DRL

Tool	Hole Size	Hole Count Plated
T1	24mil (0.60mm)	145
T2	31mil (0.80mm)	98
T3	35mil (0.90mm)	35
T4	39mil (1.00mm)	42
T5	87mil (2.20mm)	6
T6	118mil (3.00mm)	3
T7	138mil (3.50mm)	12 NPTH
Totals		341

CONTROL30 WIRING DIAGRAM

(BETAVERB,ALTOCOMP,TERMINATOR共用)



Test Procedures for CONTROL30,TERMINATOR,ALTOCOMP

Amplitude response test

On PC:

-Load file: **control30_amplitude** (APWin File menu / Open / Test)

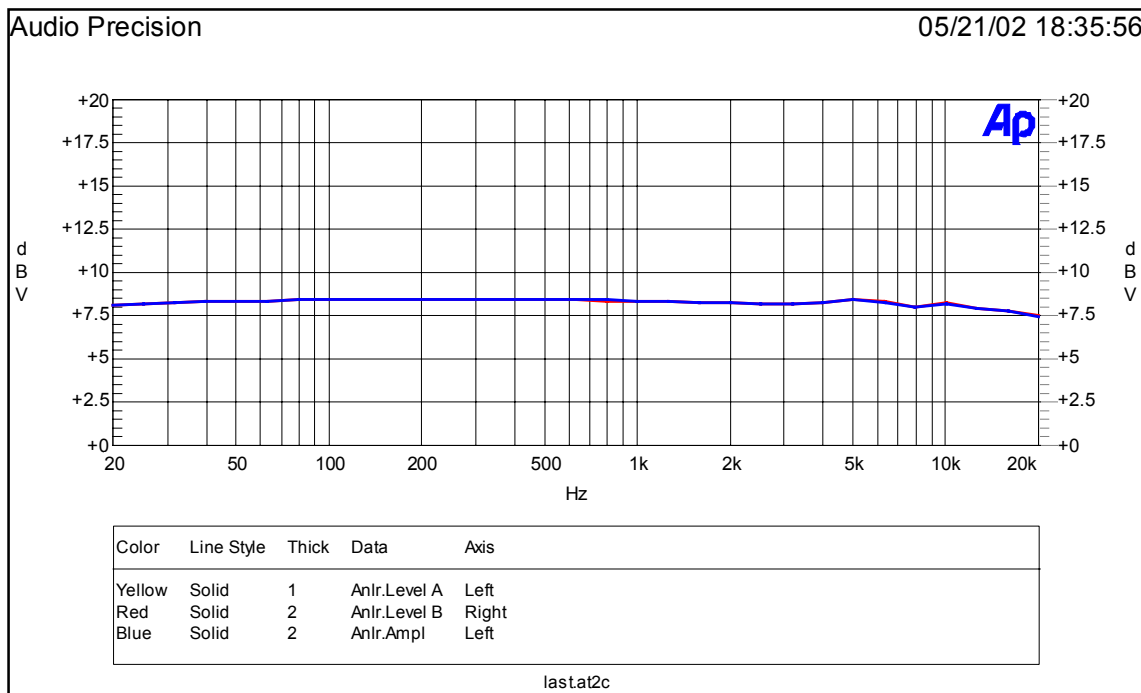
Test Connections:

- Output A of Audio Precision System Two → input 1 of the device under test.
- Output B of Audio Precision System Two → input 2 of the device under test.
- Output 1 of the device under test → A input of Audio Precision System Two.
- Output 2 of the device under test → B input of Audio Precision System Two.

On the device under test

- Turn on the power switch.
- Set INPUT volume to maximum.
- Set OUTPUT volume to maximum.
- Push BYPASS switch (on the TERMINATOR push the UTIL key then navigate the menu up to SYSTEM BYPASS and hit the ENTER key)

Start the sweep (F9) and control the results (Page3-Graph)



THD test

On PC:

-Load file: **control30_THD** (APWin File menu / Open / Test)

Test Connections:

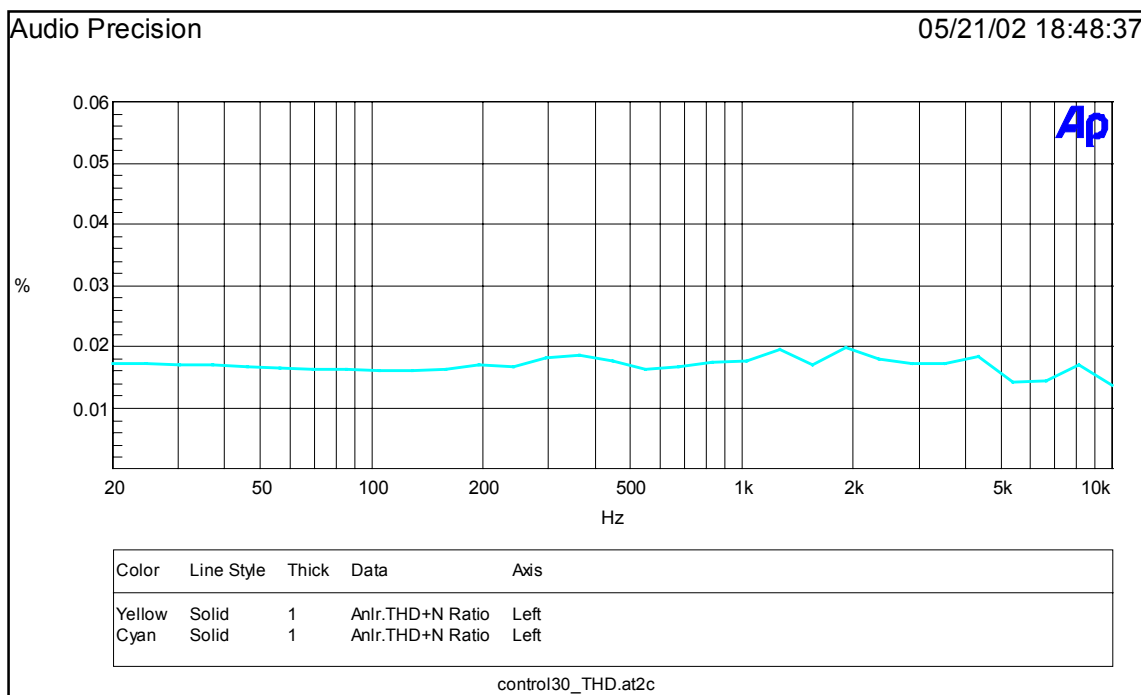
- Output A of Audio Precision System Two → input 1 of the device under test.
- Output B of Audio Precision System Two → input 2 of the device under test.

On the device under test

- Turn on the power switch.
- Set INPUT volume to maximum.
- Set OUTPUT volume to maximum.
- Push BYPASS switch (on the **TERMINATOR** push the UTIL key then navigate the menu up to SYSTEM BYPASS and hit the ENTER key)

Start the sweep (F9) and control the results (Page3-Graph) in the following conditions:

- Output 1 of the device under test → A input of Audio Precision System Two.
- Output 2 of the device under test → B input of Audio Precision System Two.



S/N test

On PC:

-Load file: **control30_SN** (APWin File menu / Open / Test)

Test Connections:

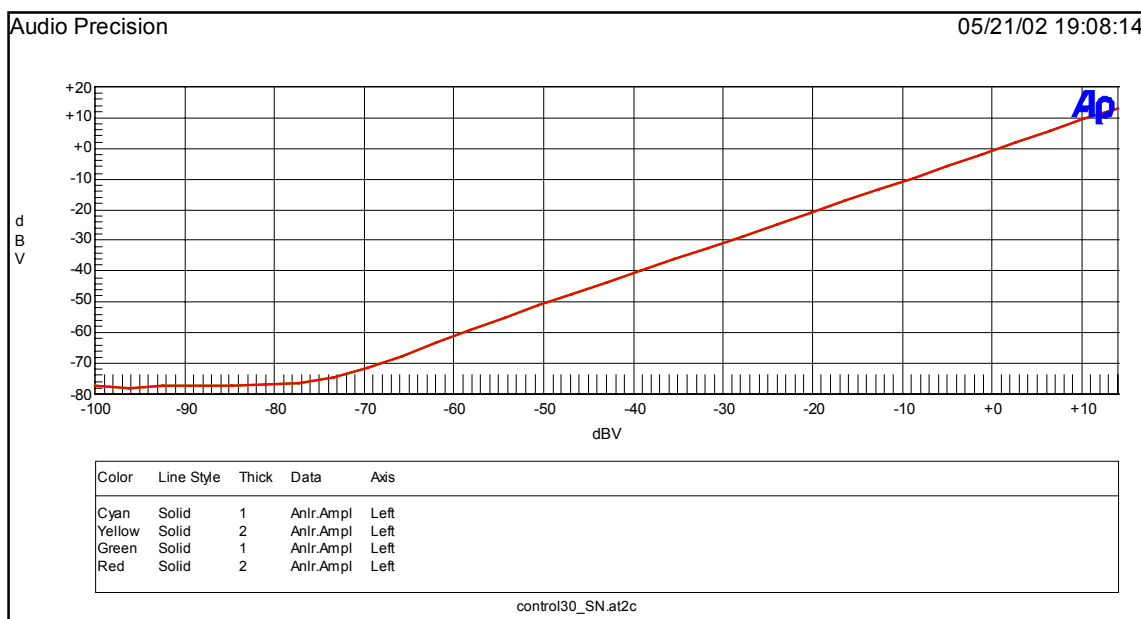
- Output A of Audio Precision System Two → input 1 of the device under test.
- Output B of Audio Precision System Two → input 2 of the device under test.

On the device under test

- Turn on the power switch.
- Set OUTPUT volume to maximum.
- Push BYPASS switch (on the **TERMINATOR** push the UTIL key then navigate the menu up to SYSTEM BYPASS and hit the ENTER key)
- increase the INPUT level until the device's outputs clip, and after reduce the INPUT level itself until the outputs exit from clipping state.

Start the sweep (F9) and control the results (Page3-Graph) in the following conditions:

- Output 1 of the device under test → A input of Audio Precision System Two.
- Output 2 of the device under test → B input of Audio Precision System Two.



Dynamics test

On PC:

-Load file: **control30_dyn** (APWin File menu / Open / Test)

Test Connections:

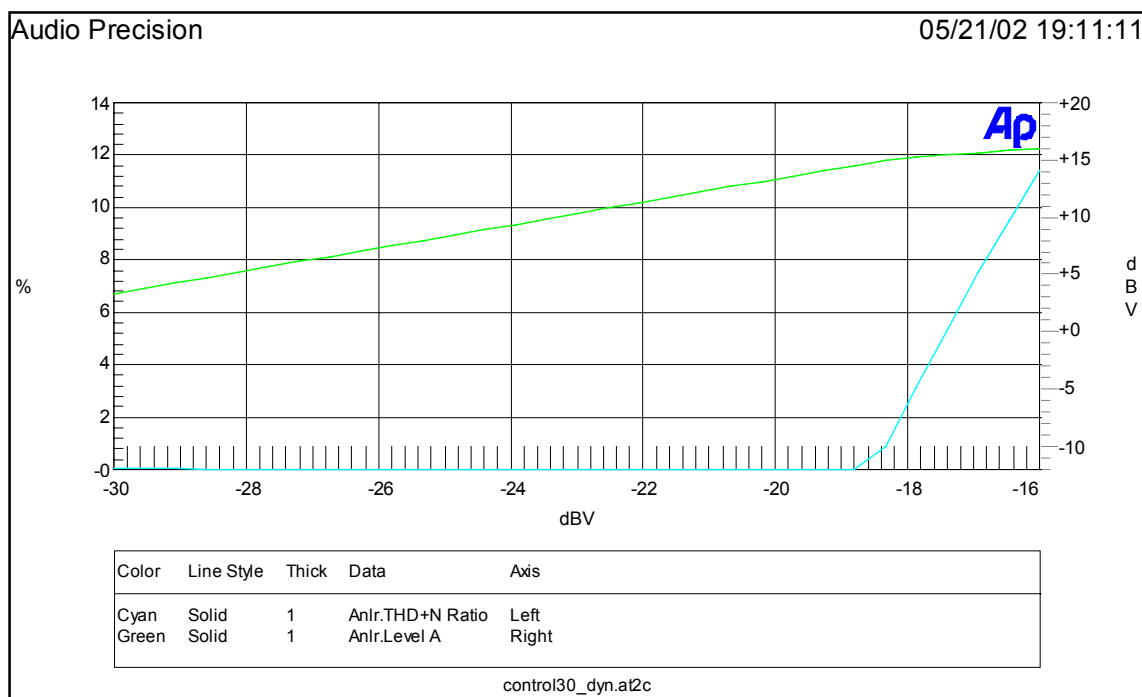
- Output A of Audio Precision System Two → input 1 of the device under test.
- Output B of Audio Precision System Two → input 2 of the device under test.

On the device under test

- Turn on the power switch.
- Set INPUT volume to maximum.
- Set OUTPUT volume to maximum.
- Push BYPASS switch (on the **TERMINATOR** push the UTIL key then navigate the menu up to SYSTEM BYPASS and hit the ENTER key)

Start the sweep (F9) and control the results (Page3-Graph) in the following conditions:

- Output 1 of the device under test → A input of Audio Precision System Two.
- Output 2 of the device under test → B input of Audio Precision System Two.



Stability test

On PC:

-Load file: **control30_stability** (APWin File menu / Open / Test)

Test Connections:

- Output A of Audio Precision System Two → input 1 of the device under test.**
- Output B of Audio Precision System Two → input 2 of the device under test.**
- Output 1 of the device under test → A input of Audio Precision System Two.**
- Output 2 of the device under test → B input of Audio Precision System Two.**

On the device under test

- Turn on the power switch.
- Turn MIX control counterclockwise (DRY).
- Set OUTPUT volume to maximum.
- Set INPUT volume to zero.
- Push BYPASS switch (on the **TERMINATOR** push the UTIL key then navigate the menu up to SYSTEM BYPASS and hit the ENTER key)
- Load **ROOM 1** Preset (Preset #001)

Test:

Move the input level knob from 0 to maximum 3 times and control the output waveforms: NO PERMANENT SINE WAVEFORMS should be visible. IF PERMANENT WAVEFORMS WITH FREQUENCY > 20kHz should become visible on whatever output channel, THE UNIT IS TO BE INSPECTED.

Multi-Level BOM Structure Listing

Report No.: IEBO_P02
 Prepared by 000011[YAFEN]
 Item No. PF00092 Version
 DESCRIPTIOALTOCOMP

Date 2003/08/21
 Page No.: 1/15

UNIT: PCS
 Date: 2002/04/17

ALTOCOMP_ALTO_230V_

Version	Item No	Loss %	Ver.	Unit	Cardinal	Effective Date
Component Remark	Item Description				Usage Rate	@:Phantom Layer
					Attrition Rate	
0001-----	MA03279				1.0000	2002/04/17
	panel			PCS	1	N
	ALTOCOMP ALTO				0.00 %	
0002-----	MB01031				1.0000	2002/04/17
	bottom board			PCS	1	N
	CONTROL30				0.00 %	
0003-----	MB02195				1.0000	2002/04/17
	rear board			PCS	1	N
	bVERB				0.00 %	
0004-----	MC00247				1.0000	2002/04/17
	top cover			PCS	1	N
	CONTROL30				0.00 %	
0005-----	MI00139				1.0000	2002/04/17
	front board			PCS	1	N
	CONTROL30				0.00 %	
0006-----	NI00114				1.0000	2002/04/17
	lucid plastic panel			PCS	1	N
	CONTROL30 ALTO(142*30mm)				0.00 %	
0007-----	NI00362				2.0000	2002/04/17
	plastic knob			PCS	1	N
	(COOL GRAY 8C/white)				0.00 %	
0008-----	NI00896				2.0000	2002/04/17
	knob cover-ABS			PCS	1	N
	8.5*4 blue 072C				0.00 %	
0009-----	NI00307				1.0000	2002/04/17
	power sw bottom			PCS	1	N
	15*12				0.00 %	
0010-----	NI01160				1.0000	2002/04/17
	power switch cap			PCS	1	N
	14.5*10 YELLOW C				0.00 %	
0011-----	NI01727				7.0000	2002/04/17
	silica gel button			PCS	1	N
	15*12*21 CONTROL 072 Cblue				0.00 %	
0012-----	SA00065				1.0000	2002/04/17
	L.E.D			PCS	1	N
	LG2043 green				0.00 %	
0013-----	HI00023				1.0000	2002/04/17
	power sw			PCS	1	N
	SDDL B 1007U				0.00 %	
0014-----	HC00015				1.0000	2002/04/17
	AC outlett			PCS	1	N
	(S)315-B (AC select)				0.00 %	
0015-----	HD00054				1.0000	2002/04/17
	fuse			PCS	1	N
	250mA 250V 5.2*20mm CSA/S/UL/VDE				0.00 %	

Multi-Level BOM Structure Listing

Report No.: IEBO_P02
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 Item No. PF00092 Version
 DESCRIPTIOALTOCOMP

Date 2003/08/21
 Page No.: 2/15

UNIT: PCS
 Date: 2002/04/17

ALTOCOMP_ALTO_230V_

Version	Item No	Loss %	Ver.	Unit	Cardinal	Effective Date
Component Remark	Item Description				Usage Rate	@:Phantom Layer
					Attrition Rate	
0016-----	MG00284				3.0000	2002/04/17
	copper pillar			PCS	1	N
	M3*8*0.5PH				0.00 %	
0017-----	MG00025				13.0000	2002/04/17
	screw			PCS	1	N
	M3*6				0.00 %	
0018-----	MG00045				4.0000	2002/04/17
	screw			PCS	1	N
	M3*7				0.00 %	
0019-----	MG00061				8.0000	2002/04/17
	screw			PCS	1	N
	M3*10				0.00 %	
0020-----	MG00041				17.0000	2002/04/17
	screw			PCS	1	N
	M3*6				0.00 %	
0021-----	MG00111				1.0000	2002/04/17
	screw			PCS	1	N
	M4*30				0.00 %	
0022-----	MG00042				2.0000	2002/04/17
	screw			PCS	1	N
	M3*10				0.00 %	
0023-----	ME00016				2.0000	2002/04/17
	colour nut			PCS	1	N
	4m/m				0.00 %	
0024-----	MF00019				1.0000	2002/04/17
	colour washer			PCS	1	N
	4* 12*1t				0.00 %	
0025-----	MF00038				2.0000	2002/04/17
	spring washer			PCS	1	N
	4* 7*1t				0.00 %	
0026-----	MF00048				2.0000	2002/04/17
	outter gear washer			PCS	1	N
	4* 8*0.5t				0.00 %	
0027-----	NC00080				4.0000	2002/04/17
	wood washer			PCS	1	N
	3.17* 8.2*1 black				0.00 %	
0028-----	HA01388				1.0000	2002/04/17
	wire AF:W126			PCS	1	N
	2P 100				0.00 %	
0029-----	HA01315				1.0000	2002/04/17
	single terminal wiring CF:W56			PCS	1	N
	100 green/yellow				0.00 %	
0030-----	HA01190				1.0000	2002/04/17
	signle terminal wiring CF:W163			PCS	1	N
	170 green/yellow				0.00 %	

Multi-Level BOM Structure Listing

Report No.: IEBO_P02
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 Item No. PF00092 Version
 DESCRIPTIOALTOCOMP

Date 2003/08/21
 Page No.: 3/15

UNIT: PCS
 Date: 2002/04/17

ALTOCOMP_ALTO_230V_

Version	Item No	Loss %	Ver.	Unit	Cardinal Usage Rate	Effective Date @:Phantom Layer	Attrition Rate
0031-----	HA02081 wire AF:W348 6P-6P 320mm			PCS	1.0000 1 0.00 %	2002/04/17 N	
0032-----	HA02128 wire 3P-3P 450mm			PCS	1.0000 1 0.00 %	2002/04/17 N	
0033-----	HA02129 wire 3P-3P 450mm			PCS	2.0000 1 0.00 %	2002/05/21 N	
0034-----	NI00312 power sw bottom square 5*5*9 hole 2.8*2.8 black			PCS	1.0000 1 0.00 %	2002/05/21 N	
0035-----	HA01798 single wave wire UL1617 AWG22 250mm black			PCS	1.0000 1 0.00 %	2002/05/21 N	
0036-----	HA01835 single wave wire UL1617 AWG22 80mm brown			PCS	1.0000 1 0.00 %	2002/05/21 N	
0037-----	HA00861 power cord Europe 3P LT-312+0.75*3C(H05VV-F) 6FT+LT-501			PCS	1.0000 1 0.00 %	2002/05/21 N	
0038-----	NI00443 rubber coil 20* 60*2tB			PCS	1.0000 1 0.00 %	2002/05/21 N	
0039-----	NI00240 sleeving flame retardant 2.5*10mm			PCS	2.0000 1 0.00 %	2002/05/21 N	
0040-----	NI00252 sleeving flame retardant 4*20mm			PCS	8.0000 1 0.00 %	2002/05/21 N	
0041-----	NI00218 cable tie-black ALT-102SB			PCS	3.0000 1 0.00 %	2002/05/21 N	
0042-----	NI01627 fixed bracket CM-19S			PCS	1.0000 1 0.00 %	2002/05/21 N	
0043-----	NI00501 foot cushion 12.7*9*3t(SF-004)			PCS	4.0000 1 0.00 %	2002/05/21 N	
0044-----	NA00137 clip-chain bag 5*7			PCS	1.0000 1 0.00 %	2002/05/21 N	
0045-----	NA00123 PE bag 0.04t*580*300mm			PCS KG	1.0000 1 0.00 %	2002/05/21 N	

Multi-Level BOM Structure Listing

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 Item No. PF00092 Version
 DESCRIPTIOALTOCOMP

Date 2003/08/21
 Page No.: 4/15

UNIT: PCS
 Date: 2002/04/17

ALTOCOMP_ALTO_230V_

Version	Item No	Loss %	Ver.	Unit	Cardinal Usage Rate	Effective Date @:Phantom Layer
Component Remark	Item Description				Attrition Rate	
0046-----	HJ00006 desiccant 30g			PCS	1.0000 1 0.00 %	2002/05/21 N
0047-----	NF00061 assurance card ALTO			PCS	1.0000 1 0.00 %	2002/05/21 N
0048-----	NB02092 inner carton ALTOCOMP ALTO			PCS	1.0000 1 0.00 %	2003/01/06 N
0049-----	NB02165 paper sheet ALTODRIVE2.3			PCS	1.0000 1 0.00 %	2003/01/07 N
0050-----	NB02166 paper sheet ALTODRIVE2.3			PCS	1.0000 1 0.00 %	2003/01/07 N
0051-----	NF00867 instruction English ALTOCOMP ALTO			PCS	1.0000 1 0.00 %	2002/05/21 N
0052-----	NB02088 outter carton 4 hole (1H) ALTO 19" series			PCS	1.0000 4 0.00 %	2003/01/07 N
0053-----	TD00103 loop transformer PT-GROUP2			PCS	1.0000 1 0.00 %	2002/05/21 N
0054-----	NE05014 ZC-bar shape adhesive paper 30*11mm ALTOCOMP			PCS	4.0000 1 0.00 %	2002/05/21 N
0055-----	NE05004 number bar shape adhesive paper 30*11mm ALTO PF			PCS	4.0000 1 0.00 %	2002/05/21 N
0056-----	NI02085 power switch fixed sleeve 22*9.69 072C blue			PCS	1.0000 1 0.00 %	2002/07/19 N
0057-----	HK00288 K-PC board P-MK3.1(ALTOCOMP)			PCS	1.0000 1 0.00 %	2002/07/19 N
0001-----	HK00287 K-PC board P-MK3.1-SMD(CTL30)			PCS	1.0000 1 0.00 %	2002/04/11 N
0001-----	HB00393 PCB-FR4/2L MK3.1(1*4)			PCS	1.0000 1 0.00 %	2002/04/13 N
0002-----	RD00059 SMDfixed resistor 1/10W 0 ±5% 0603			PCS	5.0000 1 0.00 %	2002/04/13 N

Multi-Level BOM Structure Listing

Report No.: IEBO_P02
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 DESCRIPTIOALTOCOMP
 ALTOCOMP_ALTO_230V_

UNIT: PCS
 Date: 2002/04/17

Date 2003/08/21
 Page No.: 5/15

Version	Item No	Loss %	Ver.	Unit	Cardinal	Effective Date
Component Remark	Item Description				Usage Rate	@:Phantom Layer
					Attrition Rate	
	R22 R41 R44 R45 R46					
0003-----	RD00061				11.0000	2002/04/13
	SMDfixed resistor 1/10W			PCS	1	N
	10 ±5% 0603				0.00	%
	R1 R20 R25 R26 R28 R30 R33 R35 R37 R5 R6					
0004-----	RD00068				2.0000	2002/04/13
	SMDfixed resistor 1/10W			PCS	1	N
	100 ±5% 0603				0.00	%
	R3 R4					
0005-----	RD00076				1.0000	2002/04/13
	SMDfixed resistor 1/10W			PCS	1	N
	330 ±5% 0603				0.00	%
	R38					
0006-----	RD00078				1.0000	2002/04/13
	SMDfixed resistor 1/10W			PCS	1	N
	470 ±5% 0603				0.00	%
	R51					
0007-----	RD00083				1.0000	2002/04/13
	SMDfixed resistor 1/10W			PCS	1	N
	1.0K ±5% 0603				0.00	%
	R39					
0008-----	RD00085				1.0000	2002/04/13
	SMDfixed resistor 1/10W			PCS	1	N
	1.5K ±5% 0603				0.00	%
	R2					
0009-----	RD00093				1.0000	2002/04/13
	SMDfixed resistor 1/10W			PCS	1	N
	4.7K ±5% 0603				0.00	%
	R50					
0010-----	RD00116				2.0000	2002/04/13
	SMDfixed resistor 1/10W			PCS	1	N
	100K ±5% 0603				0.00	%
	R42 R43					
0011-----	CI00051				2.0000	2002/04/13
	SMDceramic capacitor0603			PCS	1	N
	22PF/50V NPO ±5%				0.00	%
	R22 R29					
0012-----	CI00059				2.0000	2002/04/13
	SMDceramic capacitor0603			PCS	1	N
	100PF/50V NPO ±5%				0.00	%
	C19 C20					
0013-----	CI00063				2.0000	2002/04/13
	SMDceramic capacitor0603			PCS	1	N
	470PF/50V NPO ±5				0.00	%
	C37 C38					
0014-----	CI00128				16.0000	2002/09/26

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	SMDceramic capacitor0603 0.1uF/25V Y5V +80,-20%			PCS	1	N
	C10 C11 C13 C14 C17 C2 C21 C23 C25 C31 C4 C40 C5 C7 C8 C9				0.00 %	
0015-----	CI00030				2.0000	2002/04/13
	SMDceramic capacitor0805 1uF/16V Y5V-0805(2012)			PCS	1	N
	C35 C36				0.00 %	
0016-----	SE00010				3.0000	2002/04/13
	SMD rectifier diode BAS16(SOT-23)			PCS	1	N
	D1 D2 D3				0.00 %	
0017-----	SG00036				1.0000	2002/04/13
	SMD integratd circuit PCM3001E			PCS	1	N
	U13				0.00 %	
0018-----	SG00114				1.0000	2002/04/13
	smd integrated circuit TMS57002DPHA			PCS	1	N
	U8				0.00 %	
0019-----	SG00115				2.0000	2002/04/13
	smd integrated circuit DRAM 256K*4 MB81C4256A-60PJ			PCS	1	N
	U10 U9				0.00 %	
0020-----	SG00025				1.0000	2002/04/13
	SMD integratd circuit EEPROM8K*8(64Kb) 24LC64I/SN			PCS	1	N
	U1				0.00 %	
0021-----	SG00077				1.0000	2002/04/13
	SMD integrated circuit M74HC148M1R			PCS	1	N
	U2				0.00 %	
0022-----	SG00078				1.0000	2002/04/13
	SMD integrated circuit SN74HC574DW			PCS	1	N
	U7				0.00 %	
0023-----	SG00117				1.0000	2002/04/13
	SMDintegrated circuit 74F14DT			PCS	1	N
	U4				0.00 %	
0024-----	SG00074				1.0000	2002/04/13
	SMD integrated circuit 74HC32DT			PCS	1	N
	U5				0.00 %	
0025-----	SG00070				1.0000	2002/04/13
	SMD integratd circuit 74HC393DT			PCS	1	N
					0.00 %	

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Component Remark	Item Description				Usage Rate	@:Phantom Layer
					Attrition Rate	
	U15					
0026-----	HC00227				1.0000	2002/04/13
	ICjack (SMD)			PCS	1	N
	PLCC44 (D03-44T.A.4)				0.00 %	
0027-----	RD00002				4.0000	2002/04/13
	SMDfixed resistor 1/10W			PCS	1	N
	0 ±5% 0805				0.00 %	
	L4 L5 L6 L7					
0002-----	CA00022				2.0000	2002/04/11
	ceramic capacitor			PCS	1	N
	82PF NPO				0.00 %	
	C41 C42					
0003-----	CB00009				5.0000	2002/04/11
	electrolytic capacitor			PCS	1	N
	1uF/50V 4*7				0.00 %	
	C18 C24 C3 C39 C6					
0004-----	CB00024				5.0000	2002/04/11
	electrotytic capacitor			PCS	1	N
	10uF/16V 4*7				0.00 %	
	C26 C27 C28 C33 C34					
0005-----	CB00038				2.0000	2002/04/11
	electrotytic capacitor			PCS	1	N
	47uF/16V 5*7				0.00 %	
	C1 C32					
0006-----	SC00003				1.0000	2002/04/11
	quartz crystalloid			PCS	1	N
	12.000MHZ HC-49/US ±20PPM				0.00 %	
	Q1					
0007-----	CN00026				3.0000	2002/04/11
	indutor			PCS	1	N
	330uH(LGA0307-331K)				0.00 %	
	L1 L2 L3					
0008-----	HC00155				1.0000	2002/04/11
	row-pin(double)#2200			PCS	1	N
	2.54 180° 2*12P(gold-plated) 6/11.6mm				0.00 %	
	J3					
0009-----	HC00154				1.0000	2002/04/11
	row-pin(double)#2200			PCS	1	N
	2.54 180° 2*10P(gold-plated) 6/11.6mm				0.00 %	
	J2					
0010-----	HC00134				1.0000	2002/04/11
	row-pin(single)#1100			PCS	1	N
	2.54 180° 2P(gold-plated) 6/11.6mm				0.00 %	
	J4					
0011-----	HA01933				2.0000	2002/04/11
	jumper wire			PCS	1	N

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	2.5mm				0.00 %	
	S2 S3					
0012-----	NE02268				1.0000	2002/04/11
	ZC- program adhesive paper12*9mm			PCS	1	N
	ALTOCOMP-MI				0.00 %	
0013-----	SG00125				1.0000	2002/04/11
	integrated circuit			PCS	1	N
	P89C51RD2HBA				0.00 %	
0058-----	HK00289				1.0000	2002/07/19
	K-PC board			PCS	1	N
	P-G2PU1(CONTROL30)				0.00 %	
0001-----	HB00957				1.0000	2003/06/05
	pc board			PCS	1	N
	G2PU2_VER030602				0.00 %	
0002-----	RA00194				6.0000	2002/06/04
	fixed resistor 1/4W			PCS	1	N
	220 M type				0.00 %	
	R30 R31 R32 R33 R34 R35					
0003-----	RA00231				4.0000	2002/06/04
	fixed resistor 1/4W			PCS	1	N
	4.7K M type				0.00 %	
	R24 R25 R26 R27					
0004-----	RA00252				8.0000	2002/06/04
	fixed resistor 1/4W			PCS	1	N
	22K M type				0.00 %	
	R11 R12 R3 R4 R5 R6 R7 R8					
0005-----	RA00266				4.0000	2002/06/04
	fixed resistor 1/4W			PCS	1	N
	47K M type				0.00 %	
	R20 R21 R2 R23					
0006-----	RC00162				2.0000	2002/06/04
	resistor			PCS	1	N
	500 6 EVND8A				0.00 %	
	VR1 VR2					
0007-----	CA00008				2.0000	2002/06/04
	ceramic capacitor			PCS	1	N
	22PF NPO				0.00 %	
	C22 C23					
0008-----	CA00024				3.0000	2002/06/04
	ceramic capacitor			PCS	1	N
	100PF SL				0.00 %	
	C15 C16 C17					
0009-----	CH00017				15.0000	2002/06/04
	heap-layer capacitor (stand)			PCS	1	N
	0.1uF/50V Y5V PH5				0.00 %	
	C1 C13 C46 C19 C25 C3 C30 C31 C41 C42 C45 C5 C6 C7 C8					

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0010-----	CB00039 electrotytic capacitor 47uF/25V C10 C11 C12 C24 C9			PCS	5.0000 1 0.00 %	2002/06/04 N
0011-----	CB00047 electrotytic capacitor 100uF/25V C26 C27 C28 C29			PCS	4.0000 1 0.00 %	2002/10/04 Y
0012-----	CB00070 electrolytic capacitor 1000uF/16V 10*16mm C14 C20 C21			PCS	3.0000 1 0.00 %	2002/10/04 N
0013-----	CB00071 electrotytic capacitor 1000uF/25V C37 C44			PCS	2.0000 1 0.00 %	2002/10/04 N
0014-----	CB00075 electrotytic capacitor 2200uF/16V C18			PCS	1.0000 1 0.00 %	2002/10/04 N
0015-----	SA00093 rectifier diode 1N4148 0.5A			PCS	1.0000 1 0.00 %	2002/10/04 Y
0016-----	SA00094 rectifier diode 1N4002/100V D2 D3 D4 D5 D6			PCS	5.0000 1 0.00 %	2002/10/04 N
0017-----	SD00001 integrated circuit TL074CN(S&T) U1 U2			PCS	2.0000 1 0.00 %	2002/10/04 N
0018-----	SD00002 integrated circuit TL072CN U3			PCS	1.0000 1 0.00 %	2002/10/04 N
0019-----	SD00066 integrated circuit 7812(TO-220) U13			PCS	1.0000 1 0.00 %	2002/10/04 N
0020-----	SD00124 integrated circuit 7912(TO-220) U11			PCS	1.0000 1 0.00 %	2002/10/04 N
0021-----	SD00074 integrated circuit 7805(TO-220)			PCS	1.0000 1 0.00 %	2002/10/04 N

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0022-----	U12 SD00087 integrated circuit 74HC08N U6			PCS	1.0000 1 0.00 %	2002/10/04 N
0023-----	SB00017 light-electron transistor H11L1(QTC) ISO1			PCS	1.0000 1 0.00 %	2002/10/04 N
0024-----	HC00379 row-wire header 6P 2.5mm 180° J2			PCS	1.0000 1 0.00 %	2002/10/04 N
0025-----	HC00266 row-wire header JST2.5(S) 3P 2.5mm 180° J1 J4 J5			PCS	3.0000 1 0.00 %	2002/10/04 N
0026-----	HC00177 row-wire header 5P 3.96mm 180° J3			PCS	1.0000 1 0.00 %	2002/10/04 N
0027-----	HC00111 MIC jack for balance 99M-108SP1 S3 S4			PCS	2.0000 1 0.00 %	2002/10/29 N
0028-----	HC00112 MIC jack for balance 99M-107SP-1-2 90° PUSH S1 S2			PCS	2.0000 1 0.00 %	2002/10/29 N
0029-----	HC00219 DIN socket 5PIN(JY-5005) CN1 NC2 CN3			PCS	3.0000 1 0.00 %	2002/10/04 N
0030-----	CN00026 indutor 330uH(LGA0307-331K) L14			PCS	1.0000 1 0.00 %	2002/10/04 N
0031-----	CG00018 filter-EMI FILTER LF-22UH(WAH TAYI) L1 L12 L13 L2 L3 L4 L5 L6 L7 L8 L9			PCS	11.0000 1 0.00 %	2002/10/04 N
0032-----	HA01920 jumper wire 6mm JP17			PCS	1.0000 1 0.00 %	2002/10/04 N
0033-----	HA01922				5.0000	2002/10/04

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Component Remark	Item Description				Attrition Rate	
	jumper wire 8mm JP12 JP13 JP14 JP16 JP18			PCS	1 0.00 %	N
0034-----	HA01925 jumper wire 10mm JP1 JP10 JP11 JP15 JP19 J2 JP20 JP3 JP4 J5 JP9			PCS	11.0000 1 0.00 %	2002/10/04 N
0035-----	HC00339 connect terminal 6.5m/m (PCF250)			PCS	1.0000 1 0.00 %	2002/10/04 Y
0036-----	MG00162 Ni-screw M3*8			PCS	3.0000 1 0.00 %	2002/10/04 N
0037-----	MG00050 screw M3*8			PCS	2.0000 1 0.00 %	2002/10/04 N
0038-----	MF00037 spring washer 3* 5*1t			PCS	3.0000 1 0.00 %	2002/10/04 N
0039-----	NC00005 silicone insulator TO-220 square type			PCS	3.0000 1 0.00 %	2002/10/04 N
0040-----	MI00944 heat-sink CONTROL30			PCS	1.0000 1 0.00 %	2002/10/04 N
0041-----	HI00039 SW SP70300-0202-11F1-N			PCS	1.0000 1 0.00 %	2002/10/04 N
0042-----	NI02249 caushion TW-1(TO-220)			PCS	3.0000 1 0.00 %	2002/10/04 N
0043-----	HA00007 wire UL1007 22AWG 60mm black L3R3			PCS	1.0000 1 0.00 %	2002/10/04 N
0044-----	SA00088 Schottky diode 1N5817			PCS	1.0000 1 0.00 %	2002/10/29
0045-----	HC00110 MIC jack JY-6314-02-340 S5 S6 S7 S8			PCS	4.0000 1 0.00 %	2003/06/05
0059-----	HK00285 K-PC board P-G2FP1-DIP(CONTROL30)			PCS	1.0000 1 0.00 %	2002/07/19 N
0001-----	CB00024				1.0000	2003/07/14

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	electrotytic capacitor 10uF/16V 4*7 C2			PCS	1 0.00 %	Y
0002-----	CB00039 electrotytic capacitor 47uF/25V C1 C3			PCS	2.0000 1 0.00 %	2003/07/14 N
0003-----	CB00055 electrolytic capacitor 220uF/16V C4			PCS	1.0000 1 0.00 %	2003/07/14 N
0004-----	RA00184 fixed resistor 1/4W 100 M type R4			PCS	1.0000 1 0.00 %	2003/07/14 N
0005-----	RC00212 potentiometer A10K 5 R1411GOA-V1A103FN00-00 VR1			PCS	1.0000 1 0.00 %	2003/07/14 N
0006-----	RC00099 potentiometer A50K R1411GOA-V1A503FN00-00 VR2			PCS	1.0000 1 0.00 %	2003/07/14 N
0007-----	SA00053 L.E.D high intensity 3m/m round(red)long foot 26mm D1 D2 D3 D4 D5			PCS	5.0000 1 0.00 %	2003/07/14 N
0008-----	HC00065 row-wire header 2P 2.5mm 90° J1			PCS	1.0000 1 0.00 %	2003/07/14 N
0009-----	HC00393 row-wire header 6P 2.5mm 90° J6			PCS	1.0000 1 0.00 %	2003/07/14 N
0010-----	HC00404 row-wire header 3P 2.5mm small 90° J10 J5 J9			PCS	3.0000 1 0.00 %	2003/07/14 N
0011-----	HA02069 header wiring FL-0607A(A01+A11) 20P-20P PH1.27 220 J2			PCS	1.0000 1 0.00 %	2003/07/14 N
0012-----	HA02070 header wiring FL-0608A(A01+A11) 24P-24P PH1.27 120			PCS	1.0000 1 0.00 %	2003/07/14 N

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					Attrition Rate	
	J3					
0013-----	HC00141				1.0000	2003/07/14
	row pin			PCS	1	N
	2.54 180° 8P(gold-plated) 4/9.5mm				0.00 %	
	J8					
0014-----	HC00157				1.0000	2003/07/14
	row-pin(double)#2200			PCS	1	N
	2.54 180° 2*7P(gold-plated) 6/11.6mm				0.00 %	
	J4					
0015-----	HC00419				2.0000	2003/07/14
	row pin			PCS	1	Y
	2.54 180° 7P(golden-plated)19 3/13/3mm				0.00 %	
	CN1 CN2					
0016-----	NI01793				5.0000	2003/07/14
	LED separating pillar			PCS	1	N
	LEDS-17 17mm				0.00 %	
0017-----	HK00284				1.0000	2003/07/14
	K-PC board			PCS	1	N
	P-G2FP1-SMD(CONTROL30)				0.00 %	
0001-----	HB00701				1.0000	2002/06/04
	PC board			PCS	1	N
	G2FP1_VER020425				0.00 %	
0002-----	RD00002				1.0000	2002/06/04
	SMDfixed resistor 1/10W			PCS	1	N
	0 ±5% 0805				0.00 %	
	JP3					
0003-----	RD00076				18.0000	2002/06/04
	SMDfixed resistor 1/10W			PCS	1	N
	330 ±5% 0603				0.00 %	
	R19 R4 R45 R46 R47 R48 R49 R50 R51 R52 R53 R54 R55 R56 R57 R59					
	R60					
0004-----	RD00083				2.0000	2002/06/04
	SMDfixed resistor 1/10W			PCS	1	N
	1.0K ±5% 0603				0.00 %	
	R1 R2					
0005-----	RD00101				9.0000	2002/06/04
	SMDfixed resistor 1/10W			PCS	1	N
	10K ±5% 0603				0.00 %	
	R18 R37 R38 R39 R40 R41 R42 R43 R5					
0006-----	RD00119				2.0000	2002/06/04
	SMDfixed resistor 1/10W			PCS	1	N
	220K ±5% 0603				0.00 %	
	R14 R16					
0007-----	RD00270				2.0000	2002/06/04
	SMD fixed resistor 1/10W			PCS	1	N
	82.5K ±1% 0603				0.00 %	

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					Attrition Rate	
	R13 R15					
0008-----	CI00048				2.0000	2002/06/04
	SMDceramic capacitor0603			PCS	1	N
	12PF/50V NPO ±5%				0.00 %	
	C13 C14					
0009-----	CI00128				9.0000	2002/09/26
	capacitor			PCS	1	N
	0.1uF/25V Y5V +80,-20%				0.00 %	
	C10 C32 C40 C41 C42 C43 C7 C8 C9					
0010-----	SG00001				2.0000	2002/06/04
	SMD integrated circuit			PCS	1	N
	TL074CDT				0.00 %	
	U1 U2					
0011-----	SG00067				1.0000	2002/06/04
	SMD integrated circuit			PCS	1	N
	74HC04DT				0.00 %	
	U10					
0012-----	SG00074				1.0000	2002/06/04
	SMD integrated circuit			PCS	1	N
	74HC32DT				0.00 %	
	U9					
0013-----	SG00078				2.0000	2002/06/04
	SMD integrated circuit			PCS	1	N
	SN74HC574DW				0.00 %	
	U7 U8					
0014-----	RD00059				2.0000	2002/06/04
	SMDfixed resistor 1/10W			PCS	1	N
	0 ±5% 0603				0.00 %	
	R11 R9					
0018-----	HK00975				1.0000	2003/07/14
	K-PCB			PCS	1	Y
	P-G2FP1-semi-finished goods combination				0.00 %	
0001-----	MG00238				4.0000	2002/06/04
	copper pole			PCS	1	N
	M3*6*0.5PH				0.00 %	
0002-----	MG00199				8.0000	2002/06/04
	screw			PCS	1	N
	M3*4				0.00 %	
0003-----	HE00019				1.0000	2002/06/04
	LCD model			PCS	1	N
	LMC-SSC2A20DLYY-01				0.00 %	
0060-----	HK00283				1.0000	2002/07/19
	K-PC board			PCS	1	N
	P-MK31-FDKB				0.00 %	
0001-----	HB00397				1.0000	2002/04/11
	PCB-FR4/2L			PCS	1	N

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Component Remark	Item Description				Attrition Rate	
	MK31-FDKB(1*6)				0.00 %	
0002-----	HI00041				7.0000	2002/04/11
	buttom swith			PCS	1	N
	6*6*5				0.00 %	
0003-----	HC00020				1.0000	2002/04/11
	row-pin header(single)#2804			PCS	1	N
	2.54 180° 8P(gold-plated) 5.7mm				0.00 %	
0061-----	HK00286				1.0000	2002/07/19
	K-PC board			PCS	1	N
	P-MK31-LED-SMD				0.00 %	
0001-----	HB00396				1.0000	2002/04/11
	PCB			PCS	1	N
	MK31-LED(1*15)				0.00 %	
0002-----	SE00002				2.0000	2002/04/11
	SMD L.E.D			PCS	1	N
	red 67-21SURC/S530-A2/TR8 1210				0.00 %	
0003-----	SE00004				2.0000	2002/04/11
	SMD L.E.D			PCS	1	N
	yellow 67-21UYC/S530-A2/TR8 1210				0.00 %	
0004-----	SE00003				8.0000	2002/04/11
	SMD L.E.D			PCS	1	N
	green 67-21SYGC/S530-E1/TR8 1210				0.00 %	
0062-----	NE05257				1.0000	2002/12/24
	ZC-program adhesive paper 30*11mm			PCS	1	
	ALTOCOMP				0.00 %	
0063-----	NI02408				2.0000	2003/03/05
	fixed piece-ABS			PCS	1	
	15*2.7mm white CONTROL30				0.00 %	

