

B300 助听器验配流程

验配软件结构

用户界面层(UI layer)
验配计算层(Fitting calculation layer)
协议层(Communication protocol layer)
底层通讯层(Low level communication layer)

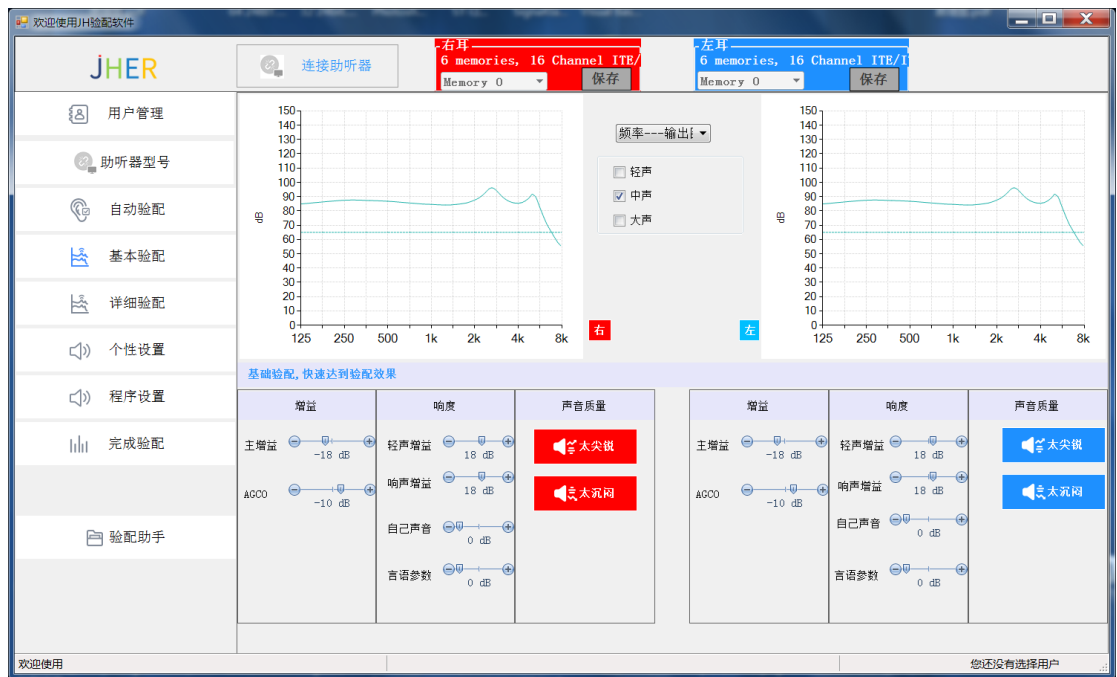
验配软件通常划分为四层结构

用户界面层

用户界面层主要的功能是提供一个交互界面，使用户可以调整助听器主要参数，包括但不限于：

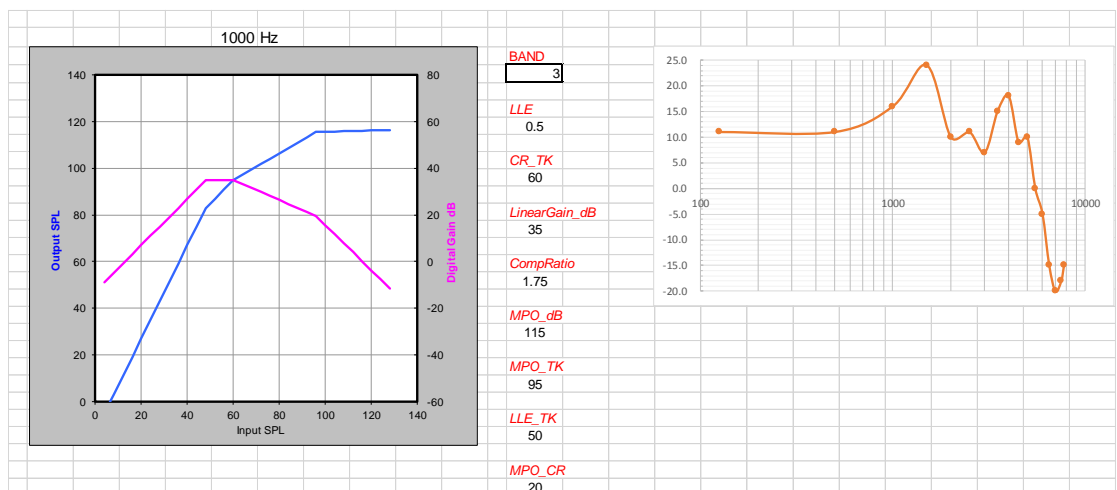
- 设备连接及信息读取
- 系统增益
- 频响控制
- 压缩控制（拐点、限幅点）
- 降噪控制
- 其它控制

示例：



验配计算层

通过 UI 层确定的参数，根据公式计算出相应的参数表
验配模型示例：



		Calculate Parameters						
Nominal		Acoustic			Digital			
Input	Index	Input	Output	Gain	Gain			
dB SPL		dB SPL	dB SPL	dB	dB	Gain	Gain	
Nominal	GainTable_Index	Input_dB_SPL	Output_dB_SPL	Gain_dB	DigitalGain_dB	Gain_V_V	Gain_Table	
	0						187797	.data 1877
4.0	1	4.0	-5.0	-9.0	-9.0	0.0	187797	.data 1877
8.0	2	8.0	3.0	-5.0	-5.0	0.0	297638	.data 2976
12.0	3	12.0	11.0	-1.0	-1.0	0.1	471725	.data 4717
16.0	4	16.0	19.0	3.0	3.0	0.1	747635	.data 7476
20.0	5	20.0	27.0	7.0	7.0	0.1	1184922	.data 1184
24.0	6	24.0	35.0	11.0	11.0	0.2	1877974	.data 1877
28.0	7	28.0	43.0	15.0	15.0	0.4	2976389	.data 2976
32.0	8	32.0	51.0	19.0	19.0	0.6	4717259	.data 4717
36.0	9	36.0	59.0	23.0	23.0	0.9	7476352	.data 7476
40.0	10	40.0	67.0	27.0	27.0	1.4	11849220	.data 1184
44.0	11	44.0	75.0	31.0	31.0	2.2	18779749	.data 1877
48.0	12	48.0	83.0	35.0	35.0	3.5	29763897	.data 2976
52.0	13	52.0	87.0	35.0	35.0	3.5	29763897	.data 2976
56.0	14	56.0	91.0	35.0	35.0	3.5	29763897	.data 2976
60.0	15	60.0	95.0	35.0	35.0	3.5	29763897	.data 2976
64.0	16	64.0	97.3	33.3	33.3	2.9	24432927	.data 2443
68.0	17	68.0	99.6	31.6	31.6	2.4	20056780	.data 2005
72.0	18	72.0	101.9	29.9	29.9	2.0	16464439	.data 1646
76.0	19	76.0	104.1	28.1	28.1	1.6	13515516	.data 1351
80.0	20	80.0	106.4	26.4	26.4	1.3	11094771	.data 1109
84.0	21	84.0	108.7	24.7	24.7	1.1	9107602	.data 9107
88.0	22	88.0	111.0	23.0	23.0	0.9	7476352	.data 7476
92.0	23	92.0	113.3	21.3	21.3	0.7	6137273	.data 6137
96.0	24	96.0	115.6	19.6	19.6	0.6	5038035	.data 5038
100.0	25	100.0	115.7	15.7	15.7	0.4	3220887	.data 3220
104.0	26	104.0	115.8	11.8	11.8	0.2	2059158	.data 2059
108.0	27	108.0	115.9	7.9	7.9	0.2	1316449	.data 1316
112.0	28	112.0	116.0	4.0	4.0	0.1	841624	.data 8416
116.0	29	116.0	116.1	0.1	0.1	0.1	538062	.data 5380
120.0	30	120.0	116.3	-3.7	-3.7	0.0	343990	.data 3439
124.0	31	124.0	116.4	-7.6	-7.6	0.0	219918	.data 2199
128.0	32	128.0	116.5	-11.5	-11.5	0.0	140596	.data 1405
				GainTable_MaxGain	24			
				GainTable_GainExp	4			

CHANNEL	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Band	125.0	750.0	1500.0	2000.0	2500.0	3000.0	3500.0	4000.0	4500.0	5000.0	5500.0	6000.0	6500.0	7000.0	7500.0		
增益(dB)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LFE	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
CR (K)(dB)	0.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
LineGain(dB)	0.0	0.0	36.0	36.0	36.0	0.0	36.0	0.0	36.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HPQ(dB)	115.0	115.0	115.0	115.0	115.0	115.0	115.0	115.0	115.0	115.0	115.0	115.0	115.0	115.0	115.0	115.0	115.0
CR_INDEX	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
CompRatio	1.0	1.0	1.8	1.8	1.8	1.0	1.8	1.0	1.8	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
声道配置	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
	10.0	-15.0	111.0	16.0	24.0	10.0	11.0	7.0	15.0	18.0	9.0	10.0	0.0	-5.0	-15.0	-20.0	-18.0
Input Output Matrix																	
4.0	1	-40.0	-40.0	-5.0	-5.0	-40.0	-5.0	-40.0	-5.0	-40.0	-40.0	-40.0	-40.0	-40.0	-40.0	-40.0	-40.0
8.0	2	-32.0	-32.0	3.0	3.0	-32.0	3.0	-32.0	3.0	-32.0	-32.0	-32.0	-32.0	-32.0	-32.0	-32.0	-32.0
12.0	3	-24.0	-24.0	11.0	11.0	-24.0	11.0	-24.0	11.0	-24.0	-24.0	-24.0	-24.0	-24.0	-24.0	-24.0	-24.0
16.0	4	-16.0	-16.0	19.0	19.0	-16.0	19.0	-16.0	19.0	-16.0	-16.0	-16.0	-16.0	-16.0	-16.0	-16.0	-16.0
20.0	5	-8.0	-8.0	27.0	27.0	-8.0	27.0	-8.0	27.0	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0
24.0	6	0.0	0.0	35.0	35.0	0.0	35.0	0.0	35.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28.0	7	8.0	8.0	43.0	43.0	8.0	43.0	8.0	43.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
32.0	8	16.0	16.0	51.0	51.0	16.0	51.0	16.0	51.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
36.0	9	24.0	24.0	59.0	59.0	24.0	59.0	24.0	59.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
40.0	10	32.0	32.0	67.0	67.0	32.0	67.0	32.0	67.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
44.0	11	40.0	40.0	75.0	75.0	40.0	75.0	40.0	75.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
48.0	12	48.0	48.0	83.0	83.0	48.0	83.0	48.0	83.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0
52.0	13	52.0	52.0	87.0	87.0	52.0	87.0	52.0	87.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0
56.0	14	56.0	56.0	91.0	91.0	56.0	91.0	56.0	91.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0
60.0	15	60.0	60.0	95.0	95.0	60.0	95.0	60.0	95.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
64.0	16	64.0	64.0	97.3	97.3	64.0	97.3	64.0	97.3	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0
68.0	17	68.0	68.0	99.6	99.6	68.0	99.6	68.0	99.6	68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0
72.0	18	72.0	72.0	101.9	101.9	72.0	101.9	72.0	101.9	72.0	72.0	72.0	72.0	72.0	72.0	72.0	72.0
76.0	19	76.0	76.0	104.1	104.1	76.0	104.1	76.0	104.1	76.0	76.0	76.0	76.0	76.0	76.0	76.0	76.0
80.0	20	80.0	80.0	106.4	106.4	80.0	106.4	80.0	106.4	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0
84.0	21	84.0	84.0	108.7	108.7	84.0	108.7	84.0	108.7	84.0	84.0	84.0	84.0	84.0	84.0	84.0	84.0
88.0	22	88.0	88.0	111.0	111.0	88.0	111.0	88.0	111.0	88.0	88.0	88.0	88.0	88.0	88.0	88.0	88.0
92.0	23	92.0	92.0	113.3	113.3	92.0	113.3	92.0	113.3	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0
96.0	24	96.0	96.0	115.6	115.6	96.0	115.6	96.0	115.6	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0
100.0	25	96.2	96.2	115.7	115.7	96.2	115.7	96.2	115.7	96.2	96.2	96.2	96.2	96.2	96.2	96.2	96.2
104.0	26	96.4	96.4	115.8	115.8	96.4	115.8	96.4	115.8	96.4	96.4	96.4	96.4	96.4	96.4	96.4	96.4
108.0	27	96.6	96.6	115.9	115.9	96.6	115.9	96.6	115.9	96.6	96.6	96.6	96.6	96.6	96.6	96.6	96.6
112.0	28	96.8	96.8	116.0	116.0	96.8	116.0	96.8	116.0	96.8	96.8	96.8	96.8	96.8	96.8	96.8	96.8
116.0	29	97.0	97.0	116.1	116.1	97.0	116.1	97.0	116.1	97.0	97.0	97.0	97.0	97.0	97.0	97.0	97.0
120.0	30	97.2	97.2	116.3	116.3	97.2	116.3	97.2	116.3	97.2	97.2	97.2	97.2	97.2	97.2	97.2	97.2
124.0	31	97.4	97.4	116.4	116.4	97.4	116.4	97.4	116.4	97.4	97.4	97.4	97.4	97.4	97.4	97.4	97.4
128.0	32	97.6	97.6	116.5	116.5	97.6	116.5	97.6	116.5	97.6	97.6	97.6	97.6	97.6	97.6	97.6	97.6
132.0	33	97.8	97.8	116.6	116.6	97.8	116.6	97.8	116.6	97.8	97.8	97.8	97.8	97.8	97.8	97.8	97.8
Acoustic Gain																	
4.0	1	-44.0	-44.0	-9.0	-9.0	-44.0	-9.0	-44.0	-9.0	-44.0	-44.0	-44.0	-44.0	-44.0	-44.0	-44.0	-44.0
8.0	2	-40.0	-40.0	-5.0	-5.0	-40.0	-5.0	-40.0	-5.0	-40.0	-40.0	-40.0	-40.0	-40.0	-40.0	-40.0	-40.0
12.0	3	-36.0	-36.0	-1.0	-1.0	-36.0	-1.0	-36.0	-36.0	-36.0	-36.0	-36.0	-36.0	-36.0	-36.0	-36.0	-36.0
16.0	4	-32.0	-32.0	3.0	3.0	-32.0	3.0	-32.0	3.0	-32.0	-32.0	-32.0	-32.0	-32.0	-32.0	-32.0	-32.0
20.0	5	-28.0	-28.0	7.0	7.0	-28.0	7.0	-28.0	7.0	-28.0	-28.0	-28.0	-28.0	-28.0	-28.0	-28.0	-28.0
24.0	6	-24.0	-24.0	11.0	11.0	-24.0	11.0	-24.0	11.0	-24.0	-24.0	-24.0	-24.0	-24.0	-24.0	-24.0	-24.0
28.0	7	-20.0	-20.0	15.0	15.0	-20.0	15.0	-20.0	15.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0
32.0	8	-16.0	-16.0	19.0	19.0	-16.0	19.0	-16.0	19.0	-16.0	-16.0	-16.0	-16.0	-16.0	-16.0	-16.0	-16.0
36.0	9	-12.0	-12.0	23.0	23.0	-12.0	23.0	-12.0	23.0	-12.0	-12.0	-12.0	-12.0	-12.0	-12.0	-12.0	-12.0
40.0	10	-8.0	-8.0	27.0	27.0	-8.0	27.0	-8.0	27.0	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0
44.0	11	-4.0	-4.0	31.0	31.0	-4.0	31.0	-4.0	31.0	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0
48.0	12	0.0	0.0	35.0	35.0	0.0	35.0	0.0	35.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52.0	13	0.0	0.0	36.0	36.0	0.0	36.0	0.0	36.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
56.0	14	0.0	0.0	36.0	36.0	0.0	36.0	0.0	36.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60.0	15	0.0	0.0	36.0	36.0	0.0	36.0	0.0	36.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.0	16	0.0	0.0	33.3	33.3	0.0	33.3	0.0	33.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
68.0	17	0.0	0.0	31.6	31.6	0.0	31.6	0.0	31.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
72.0	18	0.0	0.0	29.9	29.9	0.0	29.9	0.0	29.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
76.0	19	0.0	0.0	28.1	28.1	0.0	28.1	0.0	28.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80.0	20	0.0	0.0	26.4	26.4	0.0	26.4	0.0	26.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
84.0	21	0.0	0.0	24.7	24.7	0.0	24.7	0.0	24.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
88.0	22	0.0	0.0	23.0	23.0	0.0	23.0	0.0	23.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
92.0	23	0.0	0.0	21.3	21.3	0.0	21.3	0.0	21.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96.0	24	0.0	0.0	19.6	19.6	0.0	19.6	0.0	19.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100.0	25	-3.8	-3.8	15.7	15.7	-3.8	15.7	-3.8	15.7	-3.8.							

协议层

协议层主要负责与 B300 通讯的各种指令，比如 DSP 状态获取、DSP 停止/启动运行、静音/反静音、内存读取/写入、EEPROM 相关操作等等，将底层 I2C 指令打包成 API 协议。

底层通讯层

与 B300 通讯的各种 I2C 指令的实现，包括并不限于更改 PC 指针、更改寄存器、获取中断位置等等

综述

综上所述，验配的过程实际上就是将用户调整的结果转换成 I2C 指令的过程，其中牵涉到指令的时序、数据校验、状态配置等等问题，技术细节不述。OTC 升级的过程与验配类似，所不同在于验配只更改数据内存，程序内存保持不变，而 OTC 将更改数据内存和程序内存。