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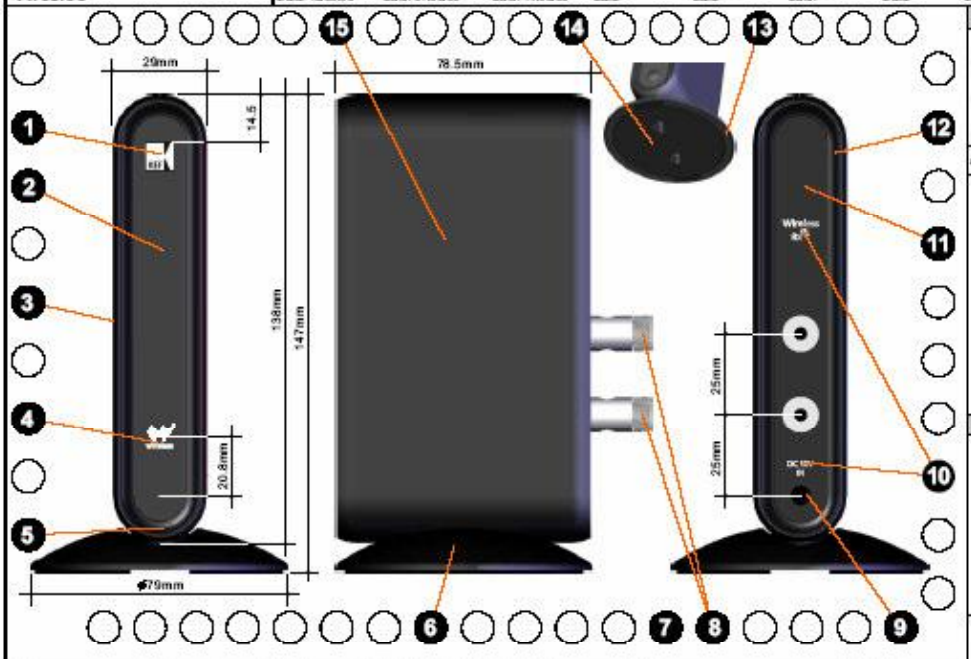
B. Black Color:

GOLD PEAK

Product Planning Department

Make-up Sheet

Project Name	Wireless 3005, 5005 & Stand Alone Receiver - Black Mirror		Project No. :	P05/018	Design No. : 006 / Version : 01
Product Designer: Jack Chang	Design Manager: Henry Lee	Project Management: Patrick Wu	Vendor :	GPE	
Date of Issue: 14/08/06	☐ 1st draft - FS1 Date: 15/05/06 ☐ 2nd draft - FS2 Date: 01/06/06 ■ Stage 1 - PDP Date: 14/08/06 ☐ Stage 2 - ES1 ☐ Stage 3 - PR ☐ Stage 4 - MP ☐ Revision 1 ☐ Revision 2				



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Date:
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No. of Page :

Legend
FS1 - Feasibility Study 1
FS1 - Feasibility Study 2
PDP - Product Dooflus
ES1 - Engineering Sample
PR - Pilot Run
MP - Mass Production
YS - Yik Sang
Ch - Chamilles

No.	Parts	Texture	YS	Ch	Substrate Color	Finish	Color	Remarks	Modifi.
1	KEF 9mm Badge				Black	Plating	High Gloss Silver	Use existing KEF 9mm badge	
2	Transparent lens (Front)				Clear	Silkscreen	Back silkscreen Black		
3	Main body (Left)				Black	Paint	Black Mirror	Color refers to existing 5005 Black Mirror speaker, use 5005 transmitter molding	
4	Bonding light (Blue LED)					Silkscreen	Back silkscreen White	Light on - Bonded, Flashing - Bonding error Position and size same as 5005 transmitter	
5	Ring (Front)				Black	Paint	Black rubber	Color refers to Color Chip "00006" sample, use 5005 transmitter molding	
6	Stand Cover (Aluminum)					Paint	Black Mirror	Color refers to existing 5005 Black Mirror speaker, use 5005 transmitter molding	
7	Speaker Line Jack (-)				Black			Use existing 5005 speaker line jack	
8	Speaker Line Jack (+)				Red			Use existing 5005 speaker line jack	
9	DC Jack				Black		Same as substrate color		
10	Product Graphics					Silkscreen	Back silkscreen chrome	Color chip sample "80019"	
11	Transparent lens (Back)				Clear	Silkscreen	Back silkscreen Black		
12	Ring (Back)				Black	Paint	Black rubber	Color refers to Colour Chip "00006" sample, use 5005 transmitter molding	
13	Rubber Foot				Black		Same as substrate color	Use 5005 transmitter molding	
14	Stand Base	Same as 3005 speaker			Black		Same as substrate color	Use 5005 transmitter molding	

2.2.2 Wireless and Electronics Parts Assembly.

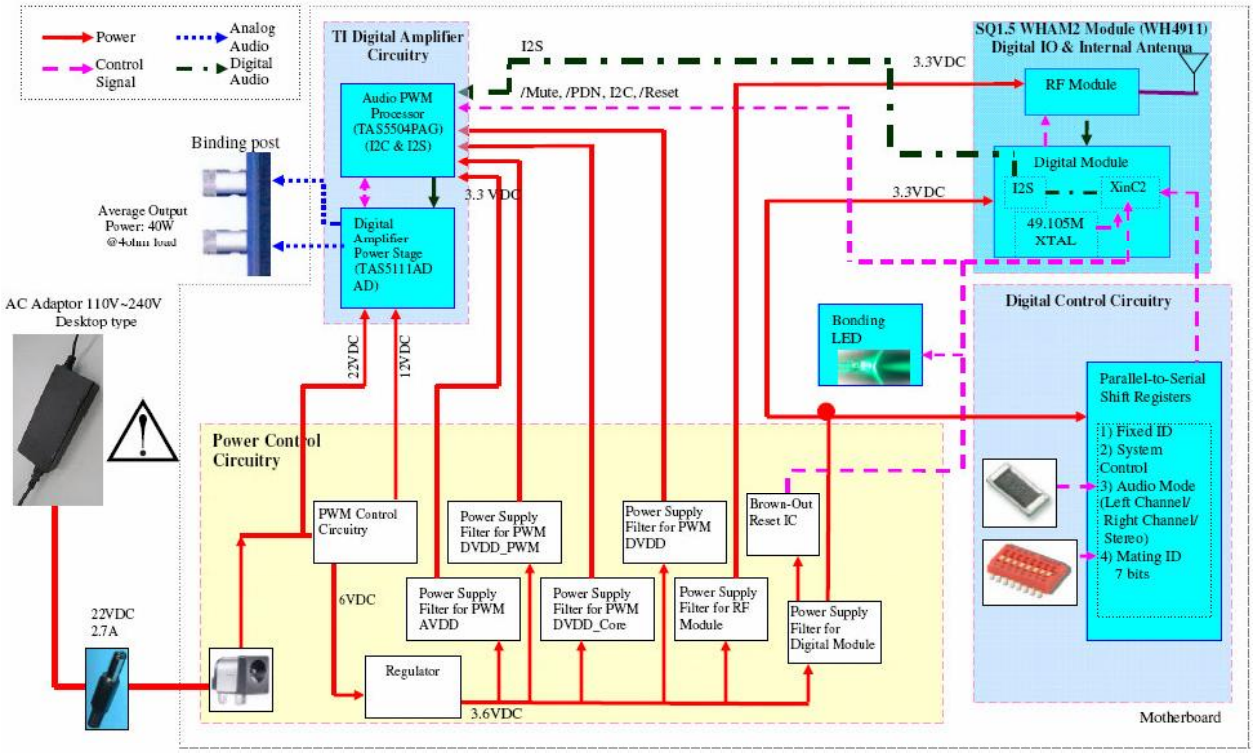
The wireless and electronics parts are assembly inside the enclosure. The PIFA antenna is placed horizontally at the top portion of the enclosure. This will give the advantages to PIFA antenna in term of better front-to-back ratio, wider coverage in the front side, symmetric planes on the left / right side and low profile as compare to those of monopoles. The outlook and features of receiver unit are given below:

- KEF 9mm Badge in the front panel.
- Front and back panels are using transparent lens.
- Bonding LED shows the operation status of a transmitter with receiver/s and the color of LED is blue.
- Binding post for speaker connection.
- DC Input Jack.
- Stand Base with rubber foot and Metal Stand Cover.

2.3 Block Diagram for Receiver.

The complete block diagram of wireless receiver is given below and based on the following:

- Eleven Engineering wireless receiver module – WH4911.
- Internal PIFA antenna.
- Texas Instruments Digital Amplifier – PWM IC (TAS5504) and Power Stage IC (TAS5111A).
- Wall-Wart Type Switched-Mode Power Supply (110 V_{AC} – 240 V_{AC}).
- 1-Channel (i.e. 60 W Peak Power or 40 W RMS Power) into 4 ohms speaker.



2.4 Features for Receiver.

No	Feature	Type	Function	User Accessible
1.	Power Input	Typical DC Jack	• DC supply voltage input for overall receiver unit from AC Adaptor.	Yes
2.	Audio Mode	3-pin, 2.54 mm Pitch Header Male	• Selection of left and right stereo channels, OR left channel audio OR right channel audio.	No
3.	Audio Output	Binding Post	• Analog audio output for speaker	Yes
3.	Volume Mode	N/A	• Fixed and default to System Control.	No
4.	Bonding Mode	N/A	• Fixed and default to Fixed ID.	No
5.	Mating ID	DIP Switch	• IDs require for TX and RX unit to be bonded with the same ID. • Totally 7-bit Mating ID available (i.e. 128 combination). • Serialize the product with the last two digits of the serial number between 00 and 99.	No
6.	Bonding LED	Blue LED	• Display the operation status between TX and RX. • Power Status LED at RX will flash when the volume up and volume down buttons at TX (if those buttons available) are pressed. **3-node operation:** • LED Solid Off when RX is not power-on. • LED Solid On when RX0 OR RX1 is bonded to the TX. • LED Flashing when RX0 is not bonded to the TX OR when RX1 is not bonded to the TX.	No
7.	License ID	N/A	• An ID provides by Eleven Engineering for using their Squeak1.5 platform in our product design. • This License ID is a 16-bit number that is reversed in the firmware to hold the license ID number. • Assign by Eleven Engineering for GP products.	No
8.	Device ID	N/A	• An ID that uses to differentiate our product line in order the TX and RX can communicate together. • This Device ID is a 16-bit number that is hardcoded into the firmware application code. • Default to 0x0000 by Eleven Engineering.	No
9.	Hops Channel	N/A	• Number of hops channel required in frequency hopping as defined by FCC / RTTE. • 20 hops will be used in our system.	No

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10.	XPD Port	8-pin, 2.54 mm pitch Header – Male	• A port that use to program the WHAM2 module.	No
11.	Speaker Label	N/A	A label to identify the following: • Left or right speaker. • Receiver Mating IDs and serial number. • The product is not for used in Japan. • For selling in France, the product, packaging and user manual must state that the product is for "Indoor Use Only".	Yes

2.5 Product Performance Specifications for Receiver.

Parameter	Specification
RF System:	
Wireless Platform	Eleven Engineering – Squeak 1.5 Digital Wireless Audio Platform. (WH4911)
Wireless Processor	Eleven Engineering – XInC wireless processor
RF Transceiver	Micro Linear ML2724, 2.4 GHz, 1.5 Mbps
Frequency Band	2.4 – 2.483 GHz (ISM Band)
RF Technology	• FSK Modulation. • Duplex. • Advanced Adaptive Frequency Hopping (AAFH).
Transmission Method	FEC / ARQ with AAFH
RF Raw Data Rate	1.5 Mbps
Channel Width	1.94 MHz @ 20 dB
Number of RF Channels	38
Hopping Channel	20
Compression	HFADPCM 16-bit 48 kHz to 5-bit 48 kHz
Audio Sampling	16-bit per channel (up to 2 channels) 48 kHz
Buffer Size / Latency	15 ms
Indoor Range	Typical living room environment (Line-of-Sight - 15 meters).
Number of Nodes	Point to Multipoint (3-node system)
Receiver:	
RX sensitivity	-80 dBm @ BER 10^{-3}
Antenna Type	Internal Antenna
Antenna Gain	~2dBi
Polarization	Vertical
Number of Antenna	One
Number of Audio Channels Available	Max 2 channels (only 1 channel used – Left channel audio or Right channel audio).
Current Consumption	~ 155 mA @ 6V (Bonded & digital amplifier Off). Max ~ 1.75A @ 18V (Bonded & digital amplifier On).
Digital Amplifier	Texas Instruments – TAS5504 PWM and TAS5111A PA
Audio Parameters:	
Output Power per channel	56 W Peak Power (28 W RMS Power) into 4 Ω
Audio Bandwidth	20 Hz - 20 kHz
THD + N (Left / Right Channel) @ 1 kHz	0.2 %
SNR, A-weighted (Left / Right Channel) @ 1 kHz	87 dB
Power Supply & Others:	
Power Supply	Switched-Mode Power Supply (110 V_{AC} – 240 V_{AC}) – (i.e. Wall-Wart type).
DC Input Power	18 V_{DC} @ 2A
Operating Temperature	0°C to + 40°C

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2.6 Electronics Circuitry for Receiver.

- The features described in this proposal are based on Squeak 1.5 Standard Product firmware provided by Eleven Engineering.
- Wireless performance must maintain high QoS with internal antenna.
- PWM IC (TAS5504) internal registers need to be written and compile into firmware hex file by Eleven Engineering. This is required for PWM IC initialization and configures internal register settings to default the volume level and mute control as according to our prototypes.
- Local materials are preferred to be used wherever possible.
- Materials must be RoHS compliant.
- Power supply and DC jack connection must be reliable.
- Binding post, audio and speaker connection must be reliable.
- Bonding Status LED is required for showing the operation status of a transmitter with a receiver and the color of LED is blue.
- Product must be approved for sell in the Europe and USA under RTTE & FCC regulations and also related meet the CE / safety requirements.

2.7 Software / Firmware for Receiver.

There is no firmware required for receiver product development as we are based on the same features as Squeak 1.5 Standard Product firmware.