Guía Ejercicios N° 4: Diseño e Instalación de Sistemas de Audio

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Amplificadores de Potencia

1) ¿Cuáles son los tipos de potencia eléctrica de un amplificador?

2) Si el nivel máximo de entrada de un amplificador (de 500 watts @ 8 Ohms, ganancia 40x) de +22 dBu ¿Qué valor debe indicar el control de nivel?

3) Indique el umbral necesario de un limitador conectado a un power de 600 watts @ 4 Ohms, ganancia 32dB, conectado a un altavoz de 300 watts @ 4 Ohms. Considere que el sistema es usado en refuerzo sonoro (debe limitarse que en el altavoz se disipen 600 watts rms).

4) Explique los parámetros de:

I. Sensibilidad de entrada,
II. Ganancia de voltaje,
III. Criterios de acoplamiento de potencia,
IV. Modos de operación Stereo y Bridge

5) ¿Por qué debe evitarse el saturar la entrada a un amplificador? ¿Cuáles son las consecuencias de este clipeo?

6) Para una caja de 450 watts @ 8 Ohms y sensibilidad 96 dB(1W,1m) se recomienda un power de 900 watts @ 8 Ohms de ganancia 35 dB. Determine el nivel de presión sonora producido a 30 m de la caja.

7) Use los datos de la caja DAS DS115 (Ver anexo) conectada al power CREST CA18 configurado con el estándar de fábrica para sensibilidad y ganancia (x115; sens 0,775 volts, ver nota al pie de la especificación del power), para establecer el nivel de presión sonora generado a 40 metros en campo libre, con señal de entrada al power de nivel nominal 0 dBu. Especifique también el nivel umbral del limitador necesario.

   Repita el ejercicio pero configura ahora la opción 1 de ganancia/sensibilidad del power (ver nota al pie de la especificación) considerando que la entrada tiene un nivel nominal de +4 dBu.

Ecualizadores - Crossovers

8) Indique las funciones principales de un EQ por bandas 1/3 oct en un sistema de refuerzo sonoro.

9) Establezca diferencias entre:

   - Crossovers activos v/s pasivos
   - Crossovers tipo Butterworth v/s Linkwitz-Riley

10) ¿Cuál es la ventaja de trabajar con un filtro Linkwitz-Riley?

Especificaciones caja pasiva DAS DS-115

DS-115 Dynamics series

INTRODUCTION

The D.A.S. DS-115 is a versatile high efficiency 2-way vented loudspeaker system.

APPLICATIONS

Intended for use in fixed and portable sound reinforcement, musical instruments, discos, clubs.

DESCRIPTION

The low frequency section utilizes a 15" speaker with 3" voice coil.

The high frequency section makes use of a Neodymium 1" exit compression driver with 1.75" titanium diaphragm, coupled to a constant directivity horn that is integral to the enclosure baffle.

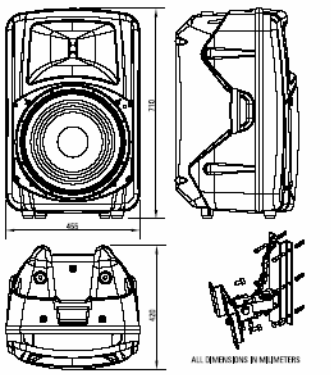
Full use of high pressure injection moulding techniques has achieved a mineral loaded polypropylene cabinet of a very high density with minimum vibration. Computer assisted [illegible] socket can be used for tripod use.

A range of optional accessories is available: mounting brackets, tripods and hanging rings provide flexible mounting options.

SPECIFICATIONS

RMS (Average) Power Handling[R]:	350 W
Program Power Handling[P]:	700 W
Peak Power Handling[C]:	1400 W
On-axis Frequency Range[S]:	50 Hz - 19 kHz
Nominal Impedance:	8 Ω
Minimum Impedance[I]:	6.7 Ω (at 39 Hz)
On-axis Sensitivity 1W / 1 m[S]:	100 dB SPL
Rated Peak SPL at Full Power:	131 dB
HF Horn Coverage Angles[HF]:	90° Horizontal x 45° Vertical (nominal)
Nominal Beamwidths[B]:	90° Horizontal
(average, 500 Hz to 8 kHz)	60° Vertical
Speech Coverage Angles[C]:	100° Horizontal x 75° Vertical
Enclosure Material:	High density mineral loaded polypropylene
Colour:	Anthacite grey
Transducers/Replacement Parts:	Low: 15P/GM 15P
	High: M-5N/GM M-5
Connector:	2 paralleled NL4 Speakon, wired to ±1
Dimensions (H x W x D):	71 x 46 x 42 cm (28 x 18 x 16.5 in)
Weight:	18.6 kg (41 lbs)
Shipping Weight:	21 kg (46 lbs)
Accessories (optional):	TRD-2 adjustable tripod
	ANL-1, 4-piece M8 eyebolt/carabiner set
	AX-115 wall mounting bracket

[R] Based on a 2 hour test using a 6 dB crest factor pink noise signal bandlimited according to IEC 268-1 (1985). All power ratings are referred to the nominal impedance.
[P] Conventionally 3 dB higher than the RMS measure, although this already utilizes a program signal.
[C] Corresponds to the signal crests for the test described in[R].
[S] As per IEC 268-5 (1989), re. a one octave band centred at 4 kHz. Half space anechoic.
[I] In practice cable and connector impedance has to be added to all impedance values.
[S] As per IEC 268-5 (1989), for the 2-10 kHz band.
[HF] -6 dB. [B] -6 dB angle, average of one-third octave band measures.
[C] There is currently no standard method of averaging the beamwidth with frequency characteristics into a single meaningful figure, which impedes comparisons across manufacturers and very often even product lines. This, our own, criterion weighs the -6 dB coverage angles from one-octave bands according to their contribution to speech intelligibility.
One and one-third octave bands comply to ANSI S1.11-1986.



D.A.S. SOUND PRODUCTS

Especificaciones amplificador CREST CA18

CREST AUDIO CA18 POWER AMPLIFIE

SPECIFICATIONS

	1kHz, 0.03% THD+N	20Hz-20kHz, 0.1% THD+N
8Ω Stereo Power	1000W	950W
4Ω Stereo Power	1800W	1700W
2Ω Stereo Power	2500W	2400W
8Ω Bridged Mono Power	3600W	3400W
4Ω Bridged Mono Power	5000W	4800W
Max RMS Output Voltage (each channel)	99V	
Peak Output Voltage (each channel)	140V	
Frequency Response (+0 / -0.3dB, 1W/8Ω)	20Hz-20kHz, -3dB@150kHz	
Power Bandwidth (rated power at 4Ω, 1% THD+N)	20Hz-20kHz, -.2dB/+.2dB	
TourClass® Protection	ACL, IGM, AutoRamp, short circuit, DC voltage, turn-on/off transient, current inrush, sub/ultrasonic input.	
THD+N (rated power at 4Ω, 1kHz)	<0.03%	
SMPTE IMD (rated power at 8Ω, 60Hz & 7kHz)	<0.01%	
Damping Factor (10-400Hz at 8Ω)	800:1	
Input CMRR (1kHz)	> - 70dB	
Input Sensitivity (rated power at 8Ω)	.775V standard (switchable; see table below)	
Voltage Gain	X115 standard (switchable; see table below)	
Input Impedance (balanced/unbalanced)	>20kΩ/>10kΩ	
Hum and Noise ("A" weighted, full power, 4Ω)	-115dB	
Crosstalk ("A" weighted, full power, 4Ω)	> - 80dB	
Class	H	
Input Connectors (per channel)	Female XLR (pin 2+, switchable for pin 3+), TRS (tip+)	
Output Connectors (per channel) (market dependent)	Speakon connectors or 2 pair of 5-way output binding posts	
Filter Storage	144,000 µF	
Power Supply (factory configured)	100V-240V, 50-60Hz	
Idle Current Draw 120V	3.0A	
1/8 Power Curr. Draw (typical music, 120V/4Ω)	12.0A	
1/3 Power Curr. Draw (continuous music, 120V/4Ω)	25.0A	
Max Curr. Draw (circuit breaker rating, 120V/4Ω)	36.0A	
Thermal Emissions (1/8 Power, 4Ω)	7125 BTU/hr	
Thermal Emissions (1/3 Power, 4Ω)	9450 BTU/hr	
Cooling	Back-to-front via 2 rear panel mounted variable-speed DC fans (filters removable without tools)	
Controls	Front Panel: 2 attenuators; Rear Panel Switches: signal ground lift, mode select, gain select, XLR input pin 2/3 hot (+)	
LED Indicators (per channel)	Clip/Limit, Signal, Temp/DC, Active	
Construction	Steel chassis, 16 gauge. Double thickness in rack ear areas.	
Dimensions (Height x Width x Depth)	5.25" x 19" x 18" / 133 x 483 x 457mm	
Gross Weight, Net Weight	82 lbs. (37.23 kg.), 77 lbs. (34.96 kg.)	
Warranty	5 years*	

		Gain	Sens
Dealer-Configurable Gain/Sensitivity Options	**Factory Standard**	X115	.775V
	Option 1	X40	2.24V
	Option 2	X20	4.47V