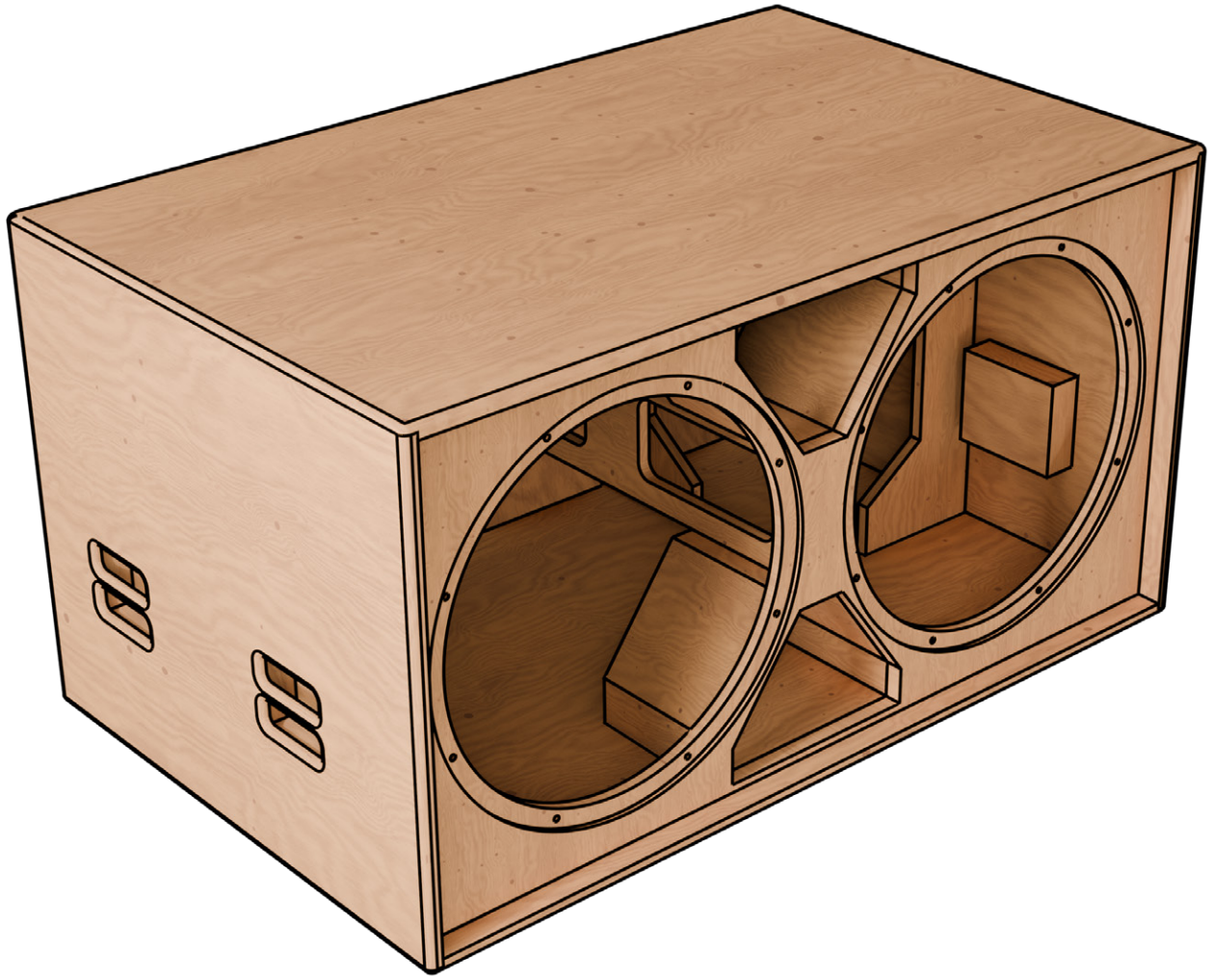
FANE

FANE 221XS DUAL 21” BASS REFLEX ENCLOSURE

DESIGNED FOR USE WITH COLOSSUS PRIME 21XS & COLOSSUS PRIME 21NDXL

FANE

PROJECT:	PART:			
Fane 221XS Dual 21” Reflex Cab				
NOTES:	REVISION: **Rev.1A**	SCALE:	DIMENSIONS: MM TOLERANCE LINEAR ± 0.4, HOLES +0.1/-0.0, NONE - CUMULATIVE	SHEET: 2 OF 24



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PROJECT:	PART:			
Fane 221XS Dual 21” Reflex Cab	**Assembly Views**			
NOTES:	REVISION: **Rev.1A**	SCALE:	DIMENSIONS: MM TOLERANCE LINEAR ± 0.4, HOLES +0.1/-0.0, NONE - CUMULATIVE	SHEET: 3 OF 24

CHOICE OF TIMBER

We recommend multi-layer 18mm Birch plywood as the best material to withstand the rigours of intensive 'life on the road' or likely exposure to damp conditions. Alternatively, 18mm Medium Density Fibreboard (MDF) offers good acoustic properties with the advantage of being less expensive (although heavier), and may be used where the cabinet will be permanently installed in a dry environment. Both materials accept any type of paint finish extremely well.

CONSTRUCTION TECHNIQUE

All joints should be totally airtight, liberally glued with PVA adhesive and screwed at 200mm (8") centres with 4.2mm or 4.8mm (No.8 or No.10) x 50 mm (2") self-tapping screws. The bracing panels are designed to ensure rigidity of construction, making the cabinet as free as possible from panel resonances caused by the internal forces generated by the loudspeaker drive unit and resulting in unwanted vibration and colouration of the sound. Again, these joints should be glued and screwed using the same method.

PORTING

The length and area of the ports as specified in the drawing should be strictly adhered to.

ACOUSTIC INSULATION

To aid panel damping and prevent internal reflections and standing waves, all internal panels of the cabinet (with the exception of the front baffle) should be lagged with acoustically absorptive material. We recommend the use of acoustic foam wadding. This should be glued, stapled or tacked to the inside of the cabinet, taking care to ensure that port tubes are not obstructed

CROSSOVER NETWORK

This cabinet is designed as a passive unit, and adequate external signal processing arrangements should be made to filter out high-frequency signals.

INTERNAL WIRING

Wiring should be kept away from moving loudspeaker parts and fastened to internal panelling to avoid buzzing. We encourage the use of colour coded wiring to identify polarity (red for +ve and black for -ve), and recommend carrying out a phase check before first using the cabinet. This is achieved by applying the positive terminal of a battery to the positive cabinet input which should result in the speaker cone moving forwards if in phase (or by using a dedicated polarity checker).

DRIVE UNIT FIXING

The drive unit should be front mounted to the baffle using T-nuts and fixing bolts, and is supplied with a length of self adhesive foam sealing strip which should be fitted around the front edge of the speaker cut-outs to guarantee airtight conditions.

LOUDSPEAKER PROTECTION

The exposed front of all speaker drive units is of course vulnerable to damage, necessitating some means of protection which must be robust but acoustically transparent. Cloth/foam type grilles are feasible for fixed cabinets, but a metal mesh grille is certainly the preferred and superior option. It is recommended that a foam gasket material is used between the wooden cabinet and the metal grille to prevent any unwanted resonances.

CABINET HARDWARE

We specify hardware products as recommend components in the construction of FANE-loaded cabinets.

CABINET FINISHING

Cabinet finishing is largely a matter of personal preference and as such, detail of this is omitted from the drawing. Generally cabinets are either painted or covered in carpet or vinyl material. If a carpet material is chosen it is recommended that a very dense tight pile type is used and that metal corner protectors are fitted. Corner protectors will have a defined radius that the edges of the cabinet should be finished to. The cabinet shown on the first page of this document has all the external edges routed with a 13mm radius and coated in a hard wearing textured epoxy paint. Two steel carrying handles have been fitted. There are various types of handles and terminal panels available and again details of these have been omitted. It is recommended that these be purchased and cutouts be made in an appropriate position in the panels before final build. Be aware that handles and terminals are not necessarily airtight, which will be detrimental to performance but can be easily remedied using a silicone sealant or polyurethane mastic to seal all joints. Contact Penn Elcom at www.penn-elcom.com to discuss their spray coating, carpet and vinyl options

! WARNING !

There are safety regulations regarding the installation of loudspeaker systems. This document is intended as a guide to construct a suitable acoustic enclosure for our components. Fane Acoustics can hold no responsibility for the structural integrity of the finished system. The system will be no stronger than the material it is made from and the joinery techniques used to assemble it. Suspending the finished system will require additional hanging hardware. There are companies who specialise in the manufacture and correct use of this hardware. They are experts and must be consulted if overhead suspension of the finished system is intended.

Further information about our drive units and more enclosure designs can be found at **http://www.fane-international.com**

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PROJECT:	PART:			
Fane 221XS Reflex Cab	**Enclosure Construction Hints and Tips**			
NOTES:	REVISION: **Rev.1A**	SCALE:	DIMENSIONS: MM TOLERANCE LINEAR ± 0.4, HOLES +0.1/-0.0, NONE - CUMULATIVE	SHEET: 4 OF 24

COLOSSUS PRIME 21XS

21” FERRITE SUB BASS DRIVER

21” / 530 mm	1500 W	30 Hz - 300 Hz	5.5” / 138.7 mm	97.5 dB	11 mm Xmax
CHASSIS DIAMETER	AES POWER HANDLING	FREQUENCY RESPONSE	VOICE COIL DIAMETER	SENSITIVITY (1W/ 1m)	MAX. LINEAR EXCURSION

The Colossus Prime 21XS is a highly dynamic driver with exceptionally low distortion, ideal for hybrid horn-loaded and bass reflex cabinet designs. The 21XS delivers a sensitivity of 97.5 dB across its operating range and can handle up to 3000 W of continuous program power.

The driver is equipped with a ceramic magnetic assembly that generates an impressive force factor of 31.3 T/m and supports linear excursion. Its design includes an optimised suspension system and a ribbed paper cone, offering outstanding mechanical stability and control. This results in extremely low distortion and allows for a peak-to-peak excursion of 60 mm before damage.

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65 YEARS OF SOUND

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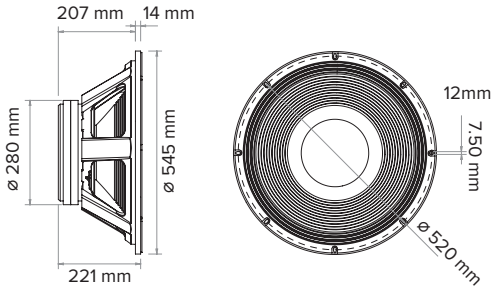
COLOSSUS PRIME 21XS

21” FERRITE SUB BASS DRIVER

1500 W	5.5” / 138.7 mm	97.5 dB
AES POWER HANDLING	VOICE COIL DIAMETER	SENSITIVITY (1W/ 1m)

- **Rigid cone membrane ensures tight, accurate bass at high excursion and SPL.**
- **5.5” Inside/ Outside windings, copper voice coil.**
- **Optimised forced air cooling offers effective power compression reduction.**
- **Silicone damped suspension system with optimised compliance.**
- **Suitable for hybrid horn-loaded and bass reflex enclosure designs.**



GENERAL SPECIFICATIONS

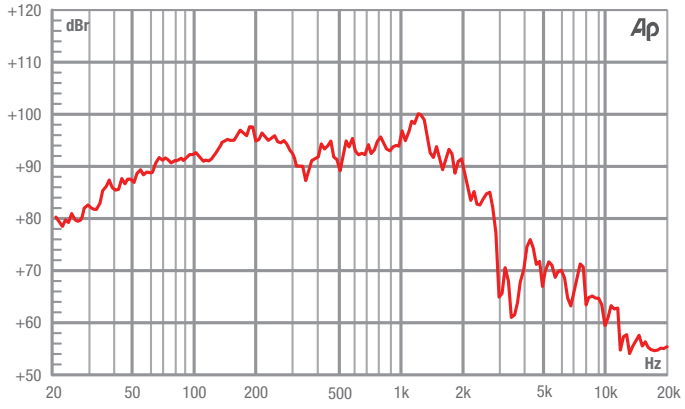
Nominal Chassis Diameter	21” / 530 mm
Nominal Impedance (1)	8 Ohm
Minimum Impedance (Zmin)	6.5 Ω
AES Power Handling (2)	1500 W (A.E.S.)
Program Power	3000 W
Peak Power (6dB Crest Factor)	6000 W
Frequency Range (-6dB)	30 Hz - 300 Hz
Sensitivity (1W/ 1m)	97.5 dB
Magnet Material	Ferrite
Magnet Weight	-
Magnetic Gap Depth	0.47” / 12 mm
Flux Density	1.2 Tesla
Former Material	Glass Fibre
Voice Coil Material	Copper - Inside/ Outside
Coil Winding Height	1.26” / 32 mm
Voice Coil Diameter	5.5” / 138.7 mm
Cone/ Dust Dome Material	Fibre Loaded Paper / Paper
Surround / Edge Termination	Fabric

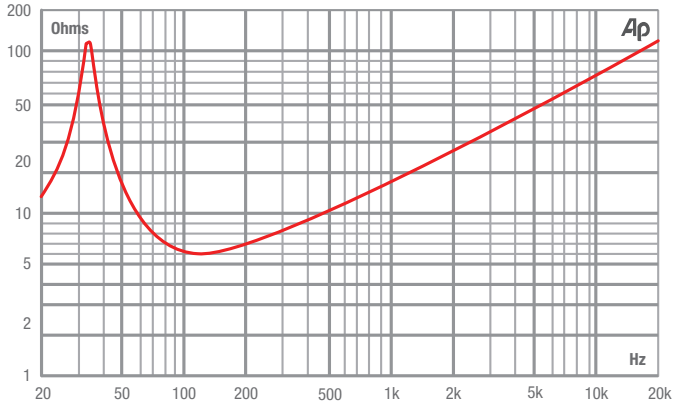
TECHNICAL & THIELE SMALL PARAMETERS

Fs	35 Hz
Re	5.1 Ω
Qms	7.88
Qes	0.354
Qts	0.339
Vas	266 Litres
Vd	1.67 Litres
Cms	65.5 µm/N
Bl	31.3 T/m
Mms	304 g
Xmax	14 mm
Sd	1520 cm^2
Efficiency	3.1 %
Le (1k Hz)	1.48 mH
EBP	88.24 Hz
Effective Piston Diameter	455 mm
Rec. Enclosure Volume	150 - 200 Litres

MOUNTING / SHIPPING INFORMATION

Overall Diameter	545 mm
Width Across Flats	N/A
Depth	8.78” / 223 mm
Flange Height	0.55” / 14 mm
Baffle Hole Diameter F/M	495 mm
Baffle Hole Diameter R/M	493 mm
Chassis Material	Die-cast Aluminium
Gasket Supplied	Front and Rear
Outer Fixing Holes	6x 12 mm x 7 mm slots on 520 mm PCD
Inner Fixing Holes	N/a
Connectors (4)	Push-button Spring Terminals
Weight	approx 26.5 Kg
Shipping Weight	30.5 Kg
Packing Carton Size (mm)	(W) 591 (D) 591 (H) 265





(1) Please enquire about alternative impedances.

(2) A.E.S. power handling test. Pink noise bandpass filtered at 12 dB per octave with cutoff frequencies of 35 Hz and 350 Hz. Driver mounted in free air, test signal applied at rated power for two hours.

(3) Half space response measured in a 975 Litre sealed box. Please note that the frequency response measurements are supplied for comparison only and are not a measure of the low frequency performance which may be achieved in a fully optimised system.

(4) Positive voltage at red terminal causes forward motion of cone.

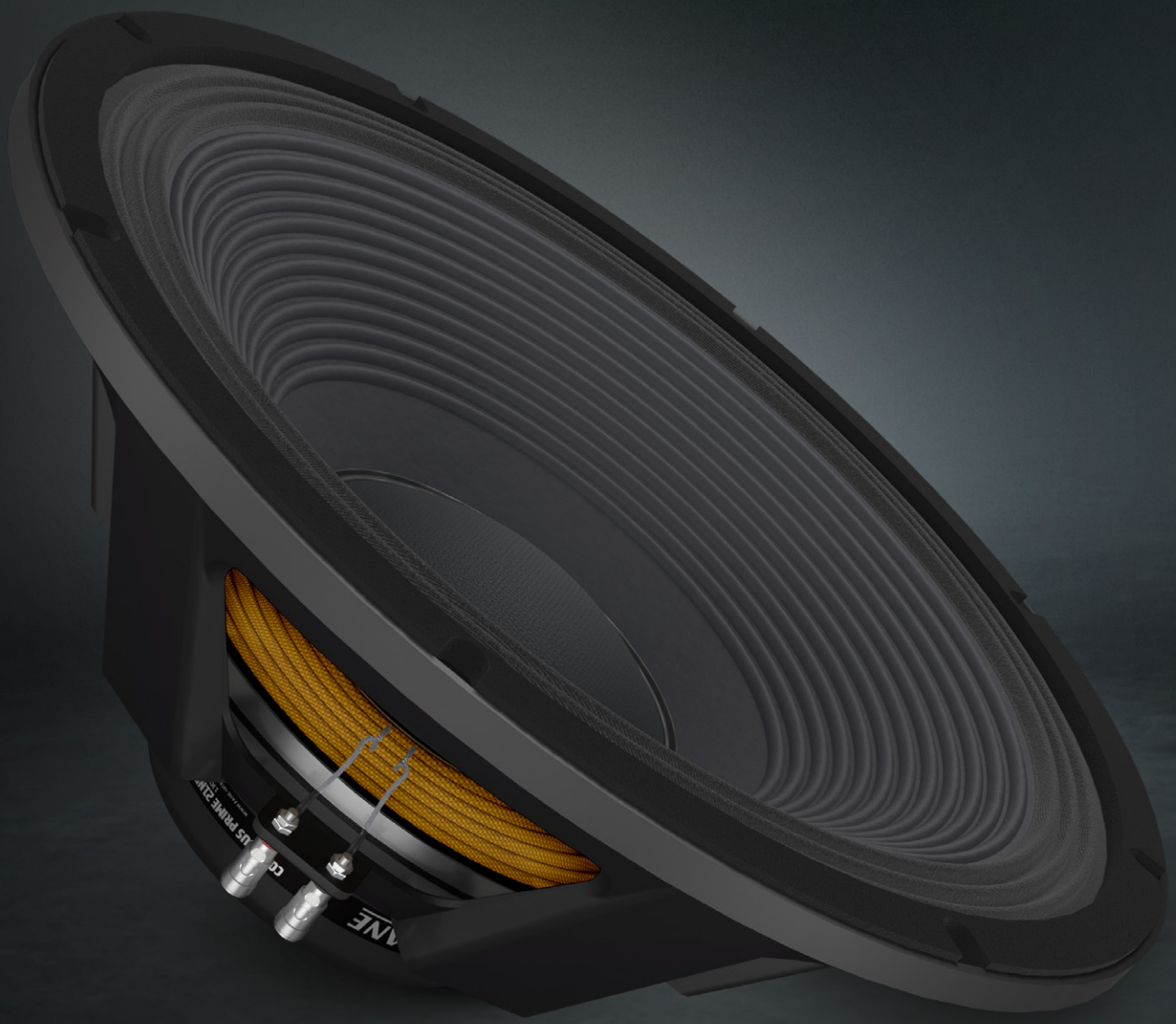
COLOSSUS PRIME 21NDXL

21” NEODYMIUM SUB BASS DRIVER

21” / 530 mm	1500 W	30 Hz - 300 Hz	5.5” / 138.7 mm	98 dB	11 mm Xmax
CHASSIS DIAMETER	AES POWER HANDLING	FREQUENCY RESPONSE	VOICE COIL DIAMETER	SENSITIVITY (1W/ 1m)	MAX. LINEAR EXCURSION

The Colossus Prime 21NDXL surpasses expectations as an incredibly high-performing, low-distortion driver that is ideal for hybrid horn-loaded and bass reflex cabinet designs. With a sensitivity of 98 dB across its working band and an ability to handle 3000 W of continuous program power, to meet the demands of high-powered applications.

Equipped with a neodymium magnetic assembly, the Colossus Prime 21NDXL generates a remarkable force factor of 30 T/m, enabling linear excursion for unparalleled performance. In addition, its optimised suspension system and ribbed paper cone provide exceptional mechanical stability and control. This design ensures extremely low distortion and allows for an impressive 60 mm of peak-to-peak excursion before reaching the damage threshold, guaranteeing consistent and reliable performance.



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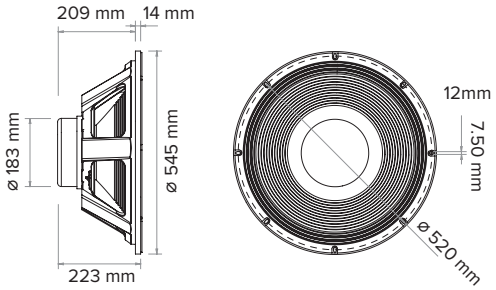
COLOSSUS PRIME 21NDXL

21” NEODYMIUM SUB BASS DRIVER

1500 W	5.5” / 138.7 mm	98 dB
AES POWER HANDLING	VOICE COIL DIAMETER	SENSITIVITY (1W/ 1m)

- **Rigid cone membrane ensures tight, accurate bass at high excursion and SPL.**
- **5.5” Inside/ Outside windings, copper voice coil.**
- **Optimised, forced air cooling of the neodymium motor system offers effective power compression reduction.**
- **Silicone damped suspension system with optimised compliance.**
- **Suitable for hybrid horn-loaded and bass reflex enclosure designs.**



GENERAL SPECIFICATIONS

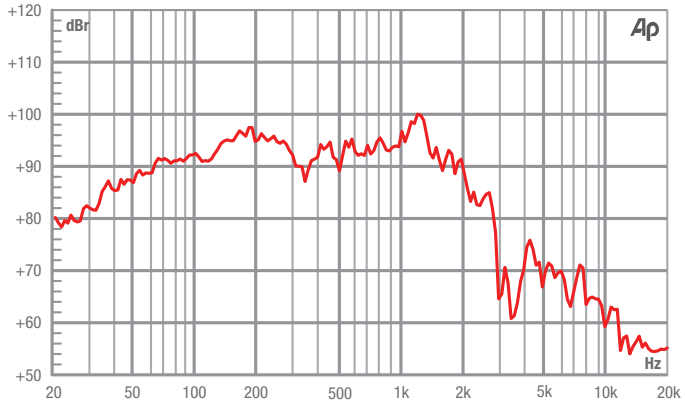
Nominal Chassis Diameter	21” / 530 mm
Nominal Impedance (1)	8 Ohm
Minimum Impedance (Zmin)	-- Ω
AES Power Handling (2)	1500 W (A.E.S.)
Program Power	3000 W
Peak Power (6dB Crest Factor)	6000 W
Frequency Range (-6dB)	30 Hz - 300 Hz
Sensitivity (1W/ 1m)	98 dB
Magnet Material	Neodymium
Magnet Weight	-
Magnetic Gap Depth	0.47” / 12 mm
Flux Density	1.45 Tesla
Former Material	Glass Fibre
Voice Coil Material	Copper - Inside/ Outside
Coil Winding Height	1.26” / 32 mm
Voice Coil Diameter	5.5” / 138.7 mm
Cone/ Dust Dome Material	Fibre Loaded Paper / Paper
Surround / Edge Termination	Fabric

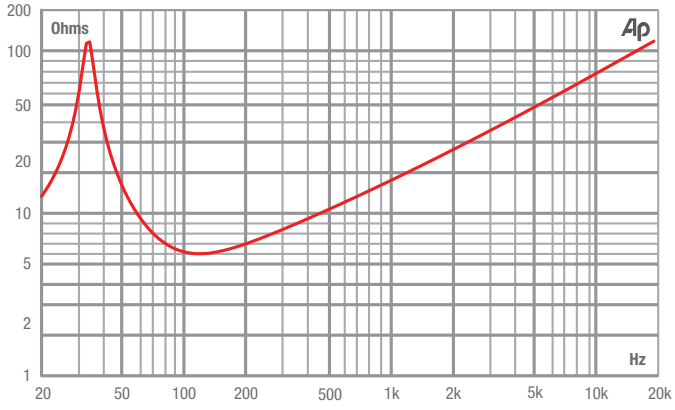
TECHNICAL & THIELE SMALL PARAMETERS

Fs	33 Hz
Re	5.1 Ω
Qms	9.8
Qes	0.374
Qts	0.36
Vas	241 Litres
Vd	1.67 Litres
Cms	73.4 µm/N
Bl	30 T/m
Mms	320 g
Xmax	14 mm
Sd	1520 cm^2
Efficiency	2.2 %
Le (1k Hz)	2.4 mH
EBP	88.24 Hz
Effective Piston Diameter	455 mm
Rec. Enclosure Volume	150 - 200 Litres

MOUNTING / SHIPPING INFORMATION

Overall Diameter	545 mm
Width Across Flats	N/A
Depth	8.85” / 225 mm
Flange Height	0.55” / 14 mm
Baffle Hole Diameter F/M	495 mm
Baffle Hole Diameter R/M	493 mm
Chassis Material	Die-cast Aluminium
Gasket Supplied	Front and Rear
Outer Fixing Holes	6x 12 mm x 7 mm slots on 520 mm PCD
Inner Fixing Holes	N/a
Connectors (4)	Push-button Spring Terminals
Weight	approx 12.5 Kg
Shipping Weight	approx 16.5 Kg
Packing Carton Size (mm)	(W) 591 (D) 591 (H) 265





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(2) A.E.S. power handling test. Pink noise bandpass filtered at 12 dB per octave with cutoff frequencies of 35 Hz and 350 Hz. Driver mounted in free air, test signal applied at rated power for two hours.

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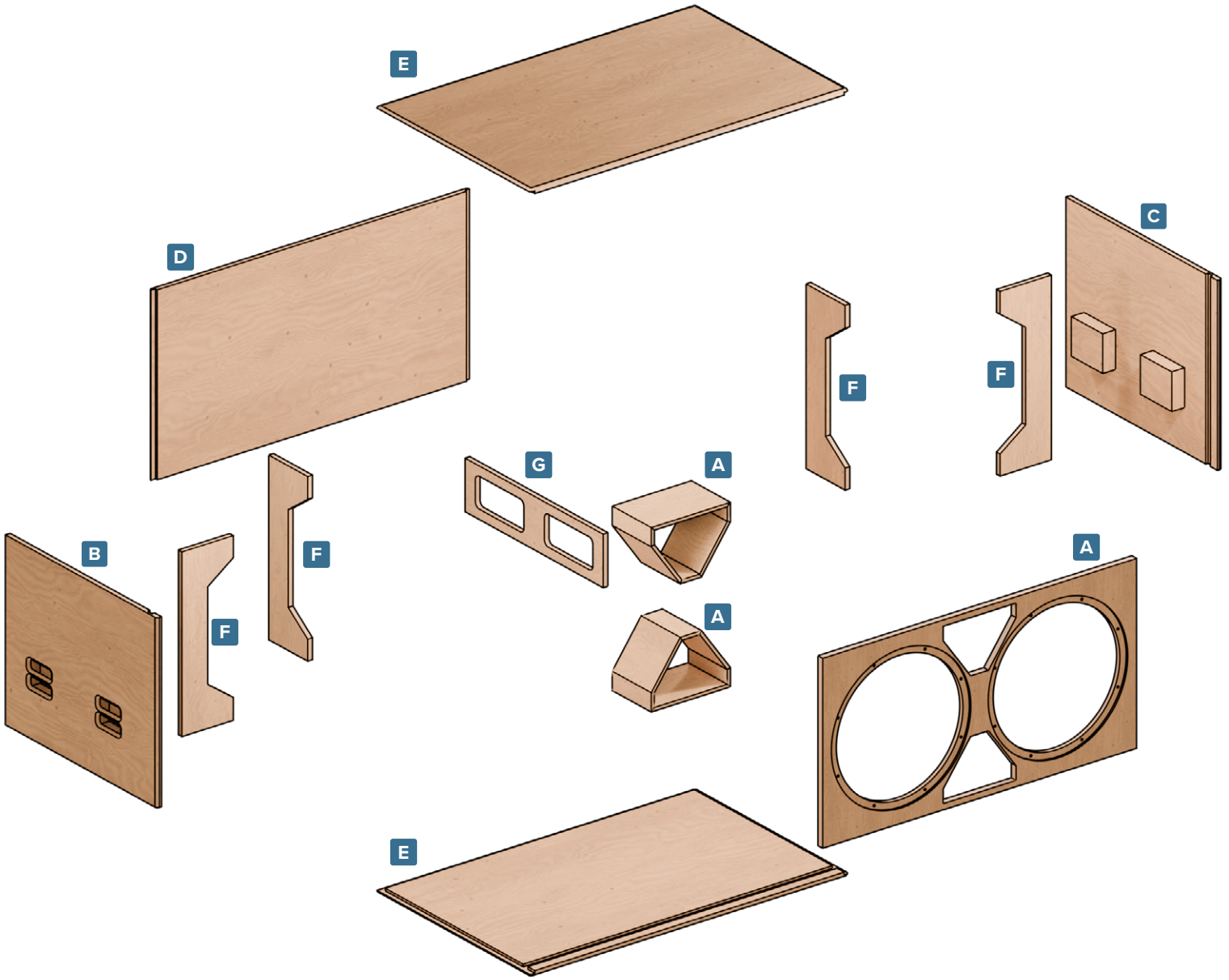
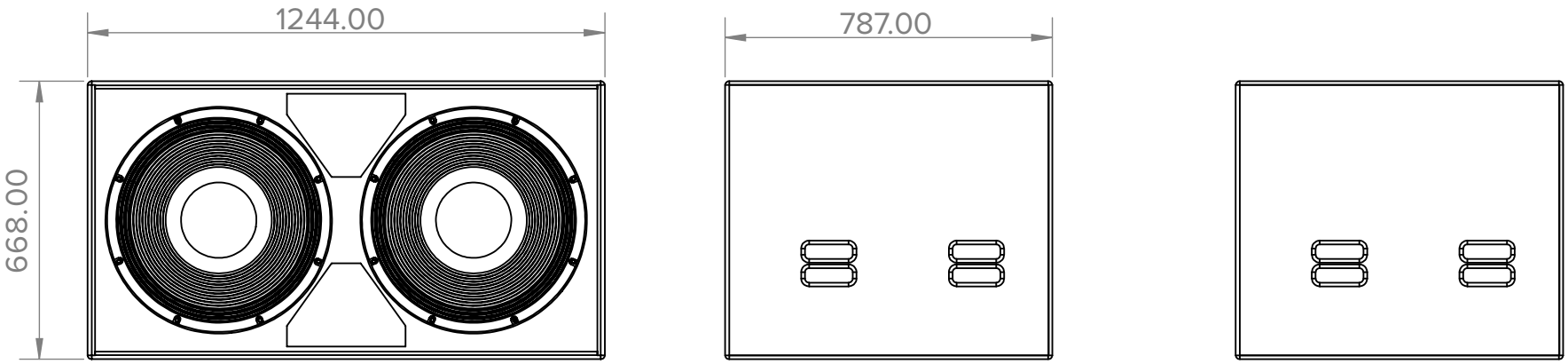
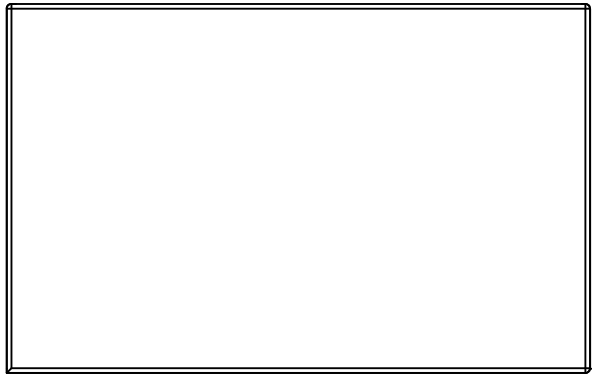
(4) Positive voltage at red terminal causes forward motion of cone.

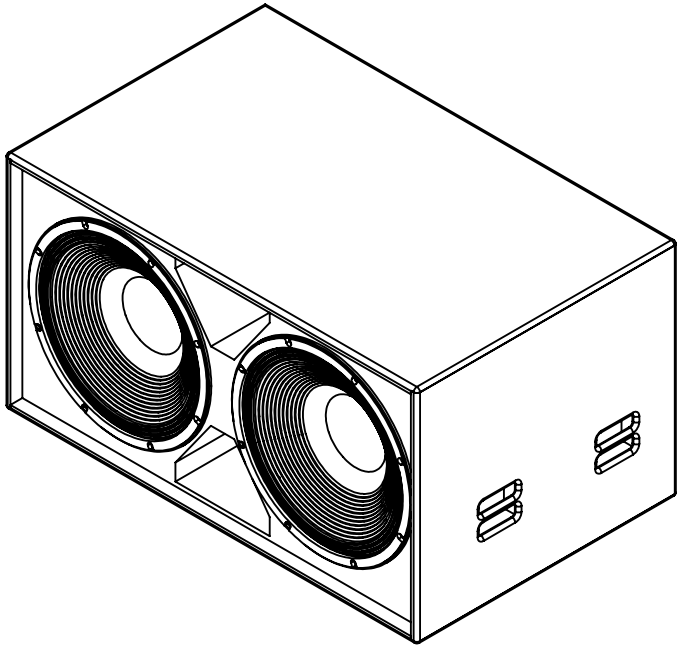


FANE

PROJECT: Fane 221XS Dual 21” Reflex Cab	PART: Parts Exploded View				
NOTES:	REVISION: Rev.1A	SCALE:	DIMENSIONS: MM TOLERANCE LINEAR ± 0.4, HOLES +0.1/-0.0, NONE - CUMULATIVE	SHEET: 9 OF 24	



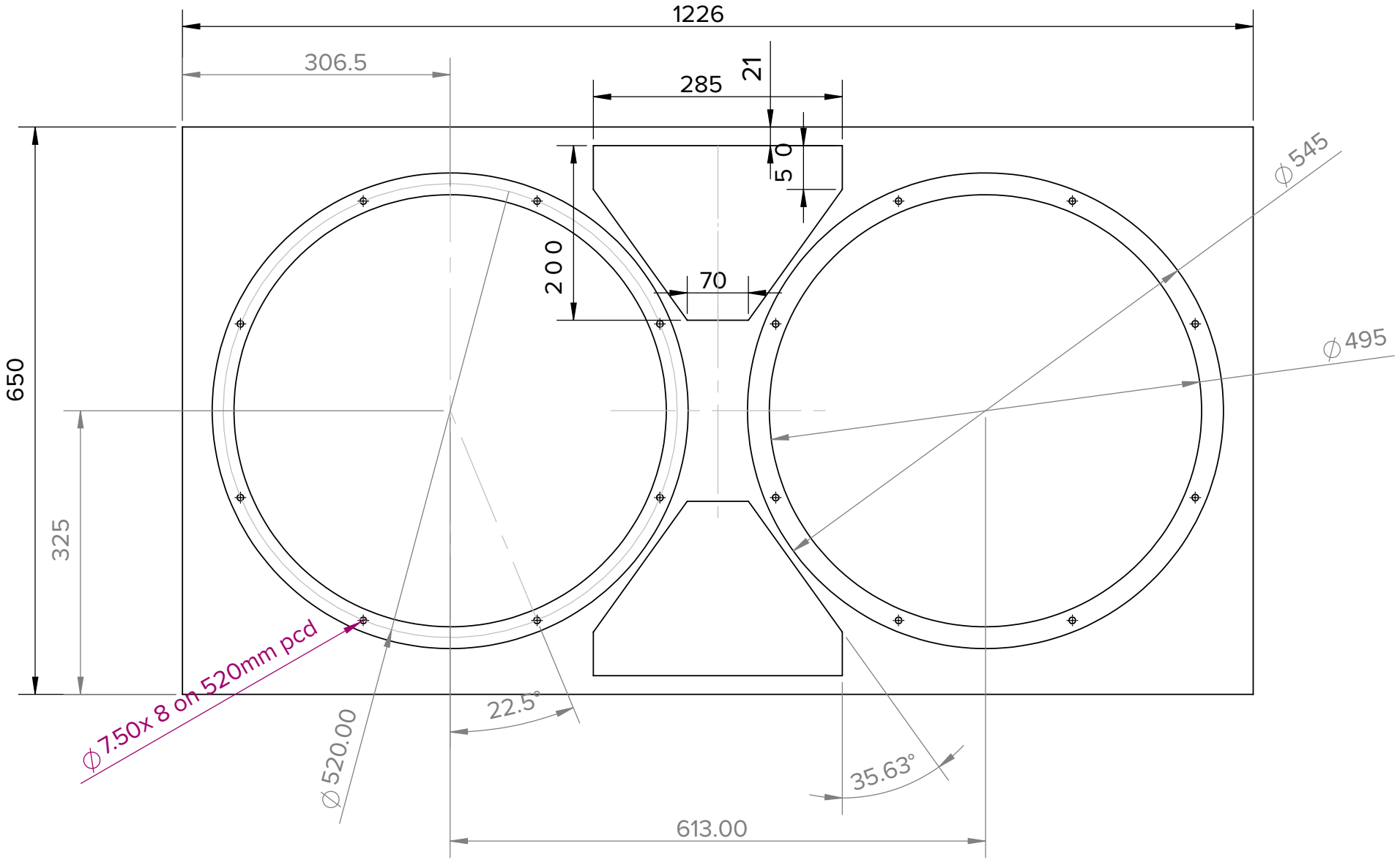




Net Volume 477 ltr - Tuning 35Hz
HPF: Butterworth 24 dB/oct @30Hz
LPF: Butterworth 12 dB/Oct @95 Hz
135dB Maximum SPL
2800 watts with 4 Ohm Load

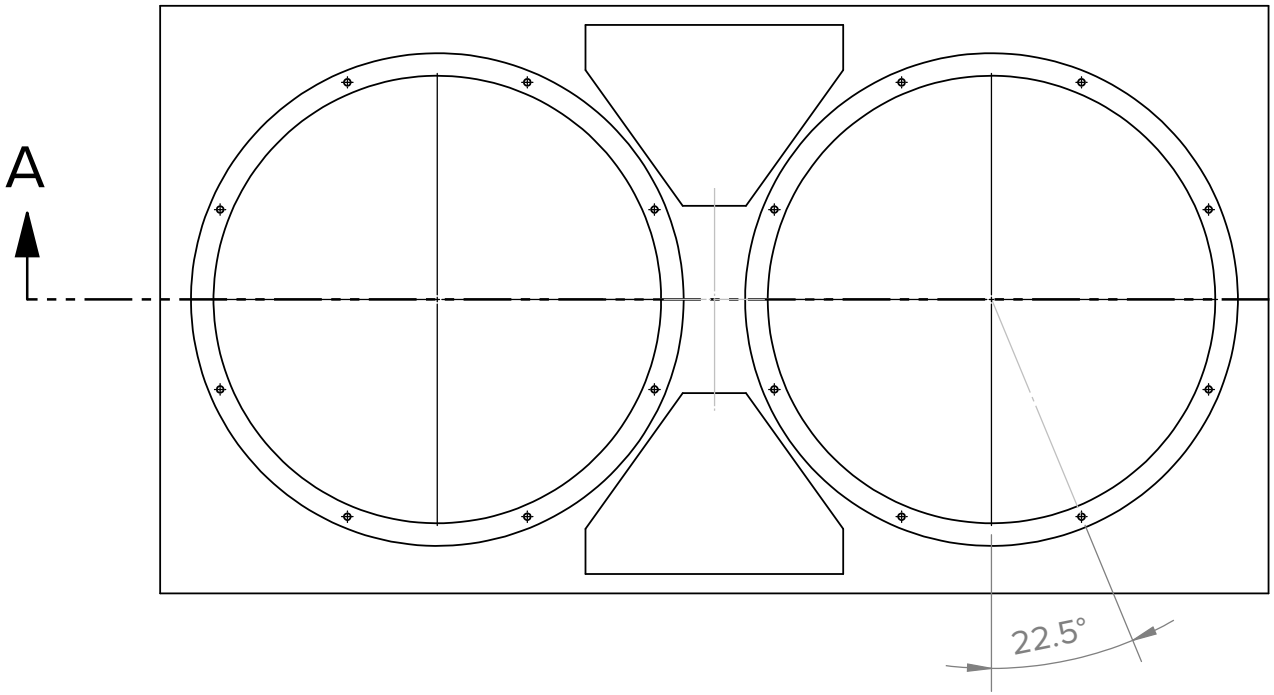
FANE

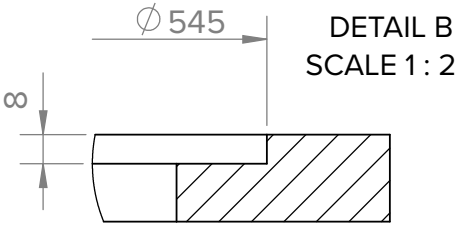
PROJECT: **Fane 221XS Dual 21" Reflex Cab**	PART:			
NOTES:	REVISION: **Rev.1A**	SCALE:	DIMENSIONS: MM TOLERANCE LINEAR ± 0.4, HOLES +0.1/-0.0, NONE - CUMULATIVE	SHEET: 10 OF 24



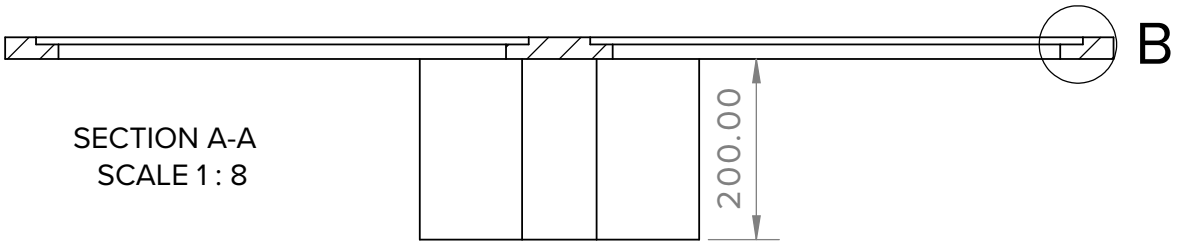
FANE

PROJECT: Fane 221XS Dual 21" Reflex Cab	PART: A. Baffle and Port Construction			
NOTES:	REVISION: Rev.1A	SCALE:	DIMENSIONS: MM TOLERANCE LINEAR ± 0.4, HOLES +0.1/-0.0, NONE - CUMULATIVE	SHEET: 11 OF 24

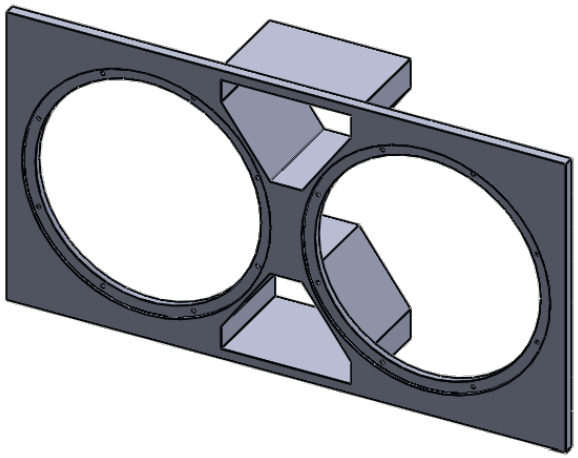




DETAIL B
SCALE 1 : 2

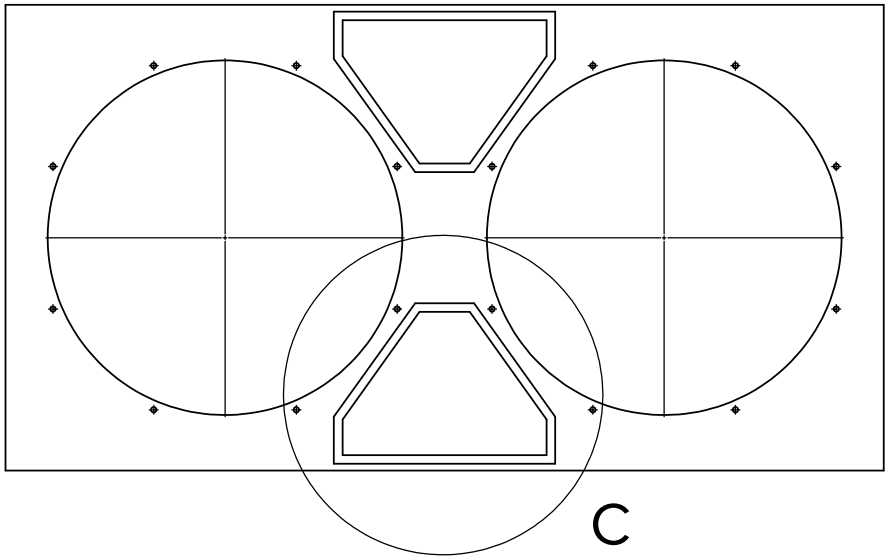


SECTION A-A
SCALE 1 : 8

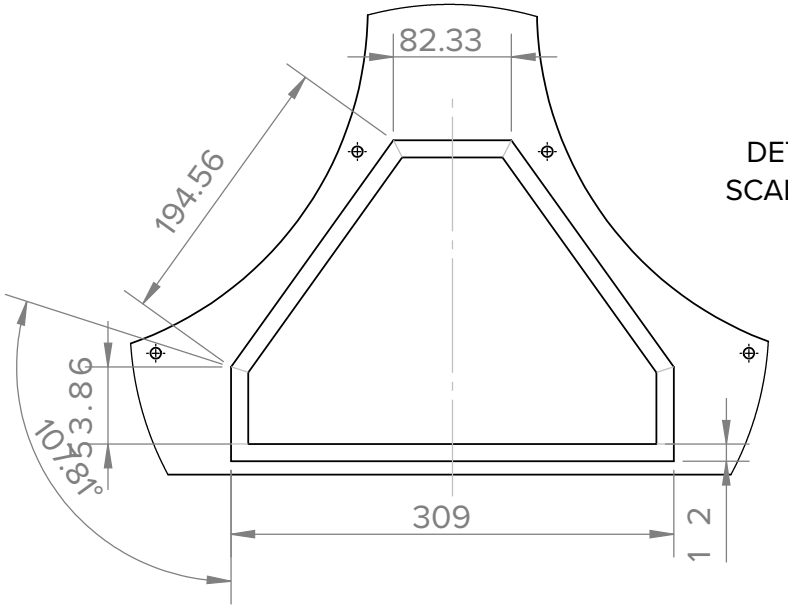


FANE

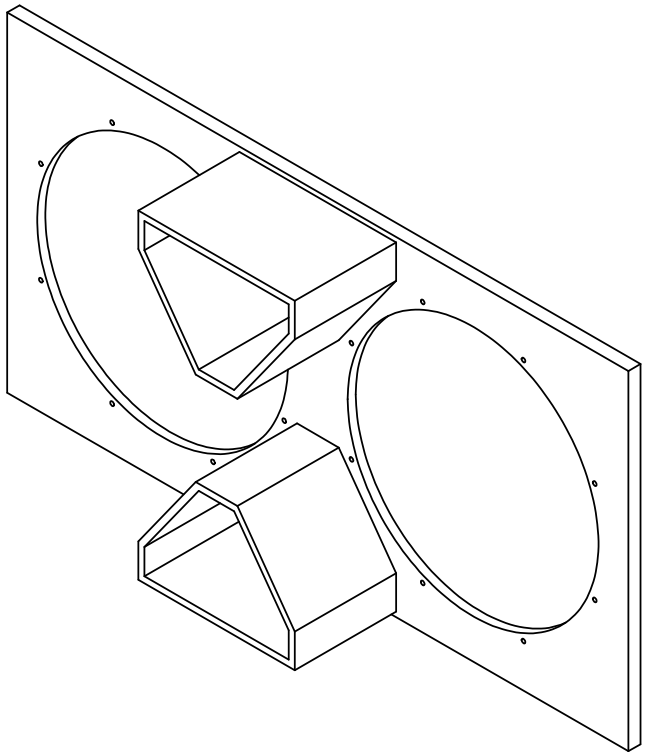
PROJECT: **Fane 221XS Dual 21" Reflex Cab**			PART: **A. Baffle and Port Construction**		
NOTES:	REVISION: **Rev.1A**	SCALE:	DIMENSIONS: MM TOLERANCE LINEAR ± 0.4, HOLES +0.1/-0.0, NONE - CUMULATIVE	SHEET: 12 OF 24	



C



DETAIL C
SCALE 1 : 5



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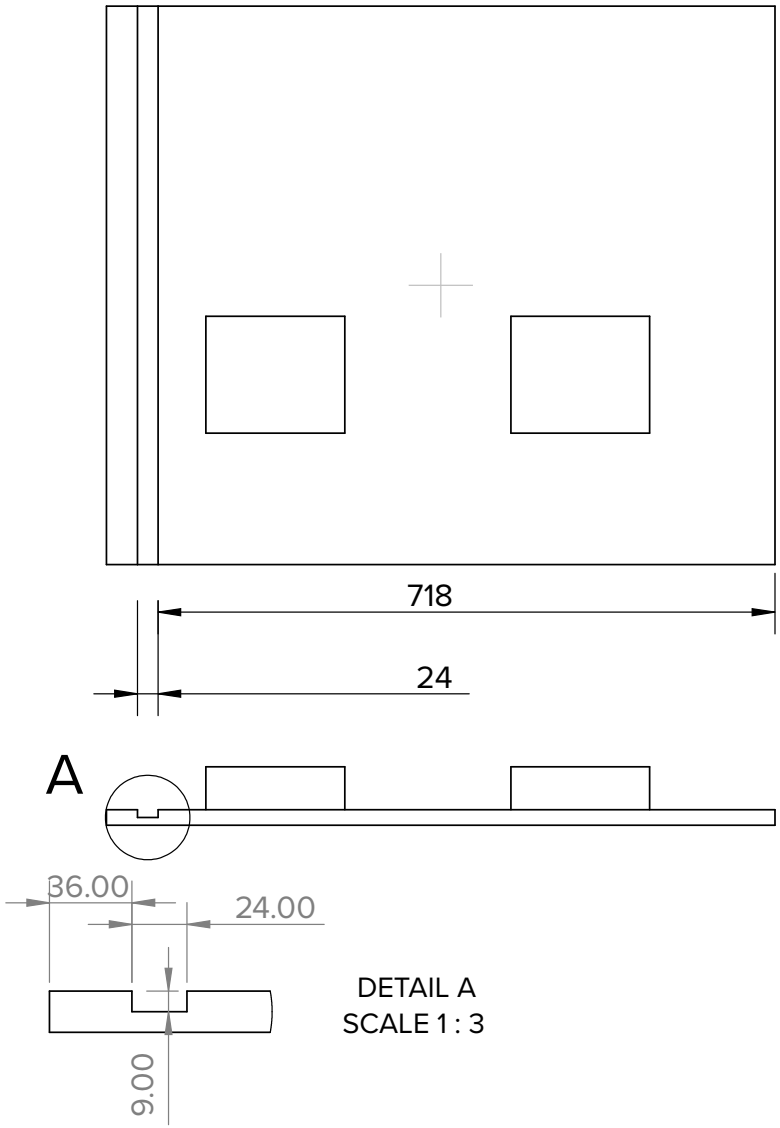
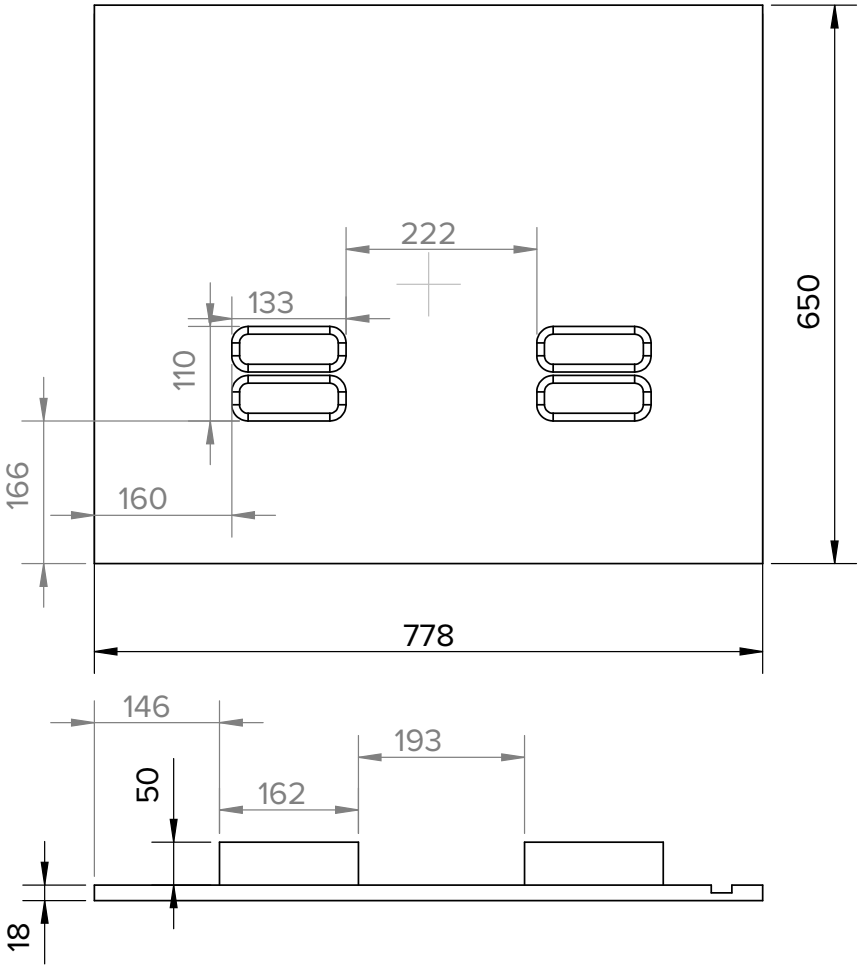
PROJECT: **Fane 221XS Dual 21” Reflex Cab**	PART: **A. Baffle and Port Construction**				
NOTES: **2 Ports Required**	REVISION: **Rev.1A**	SCALE:	DIMENSIONS: MM TOLERANCE LINEAR ± 0.4, HOLES +0.1/-0.0, NONE - CUMULATIVE	SHEET: 13 OF 24	



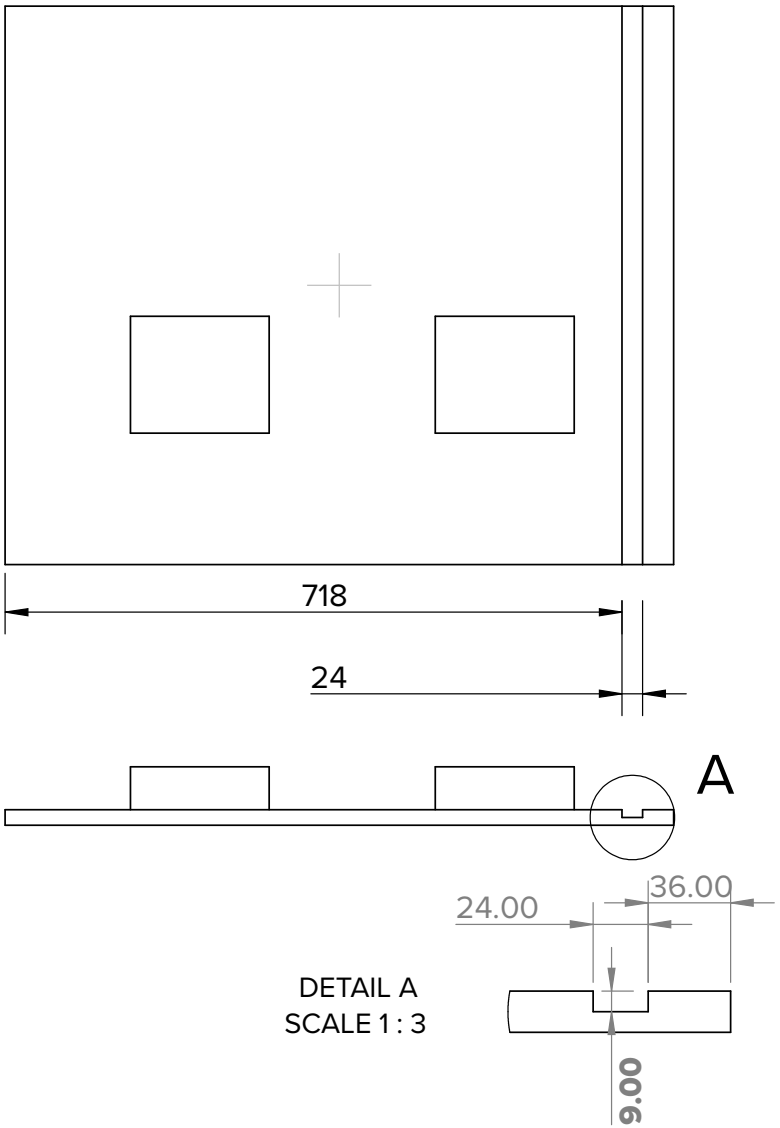
DETAIL A
SCALE 1 : 3



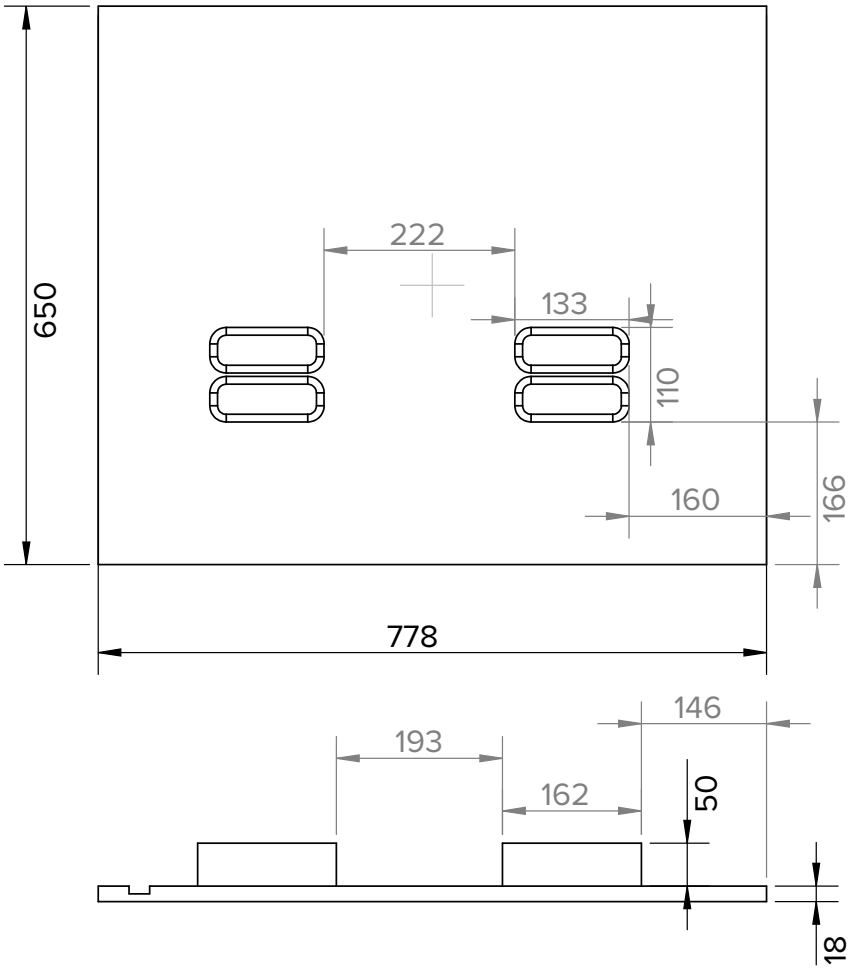
Handle positions for illustration olny:

FANE

PROJECT:	PART:				
Fane 221XS Dual 21” Reflex Cab	**B. Left Side Panel**				
NOTES:	REVISION: **Rev.1A**	SCALE:	DIMENSIONS: MM TOLERANCE LINEAR ± 0.4, HOLES +0.1/-0.0, NONE - CUMULATIVE	SHEET: 14 OF 24	



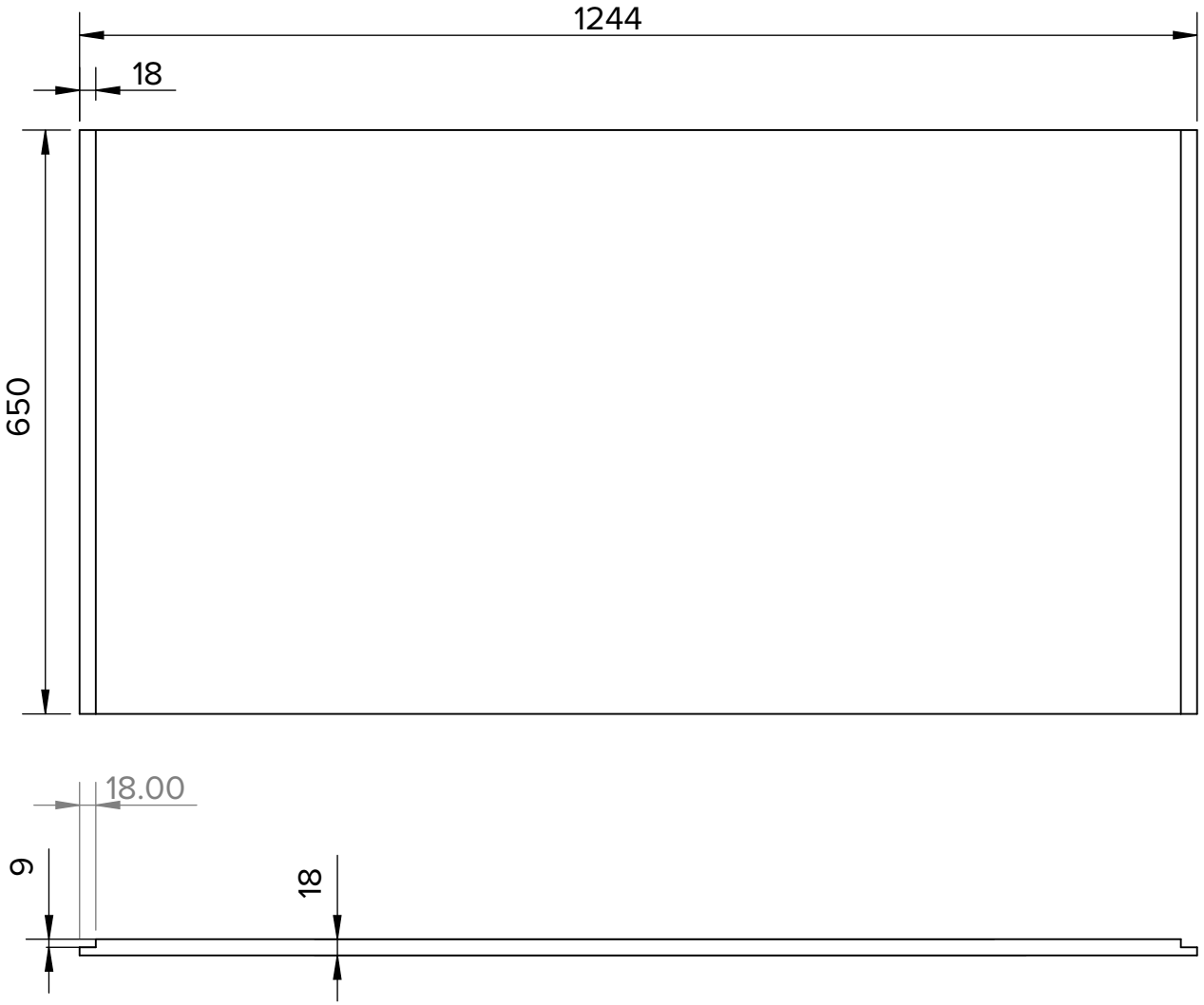
DETAIL A
SCALE 1 : 3



Handle positions for illustration olny:

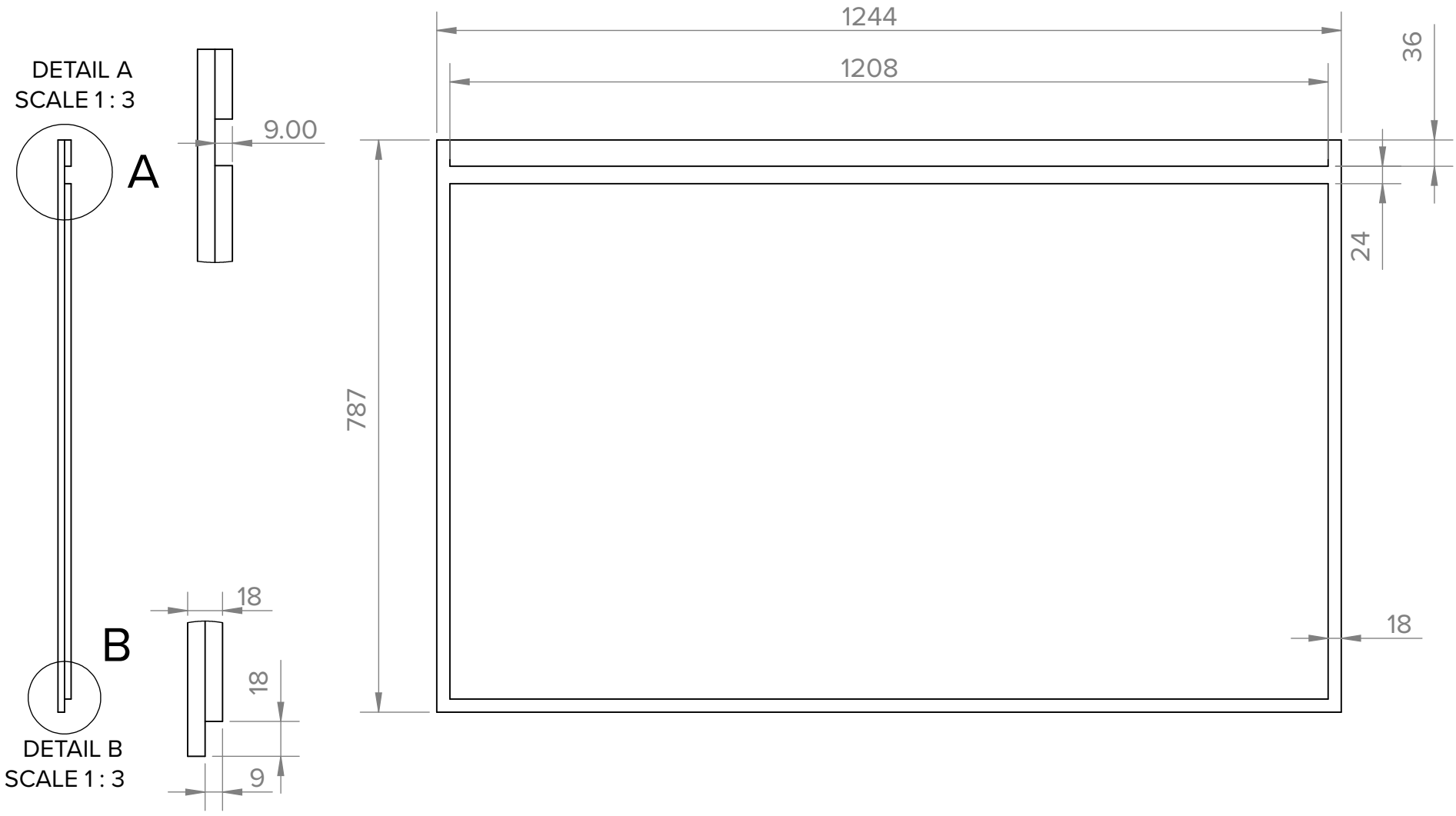
FANE

PROJECT: Fane 221XS Dual 21” Reflex Cab	PART: C. Right Side Panel			
NOTES:	REVISION: Rev.1A	SCALE:	DIMENSIONS: MM TOLERANCE LINEAR ± 0.4, HOLES +0.1/-0.0, NONE - CUMULATIVE	SHEET: 15 OF 24



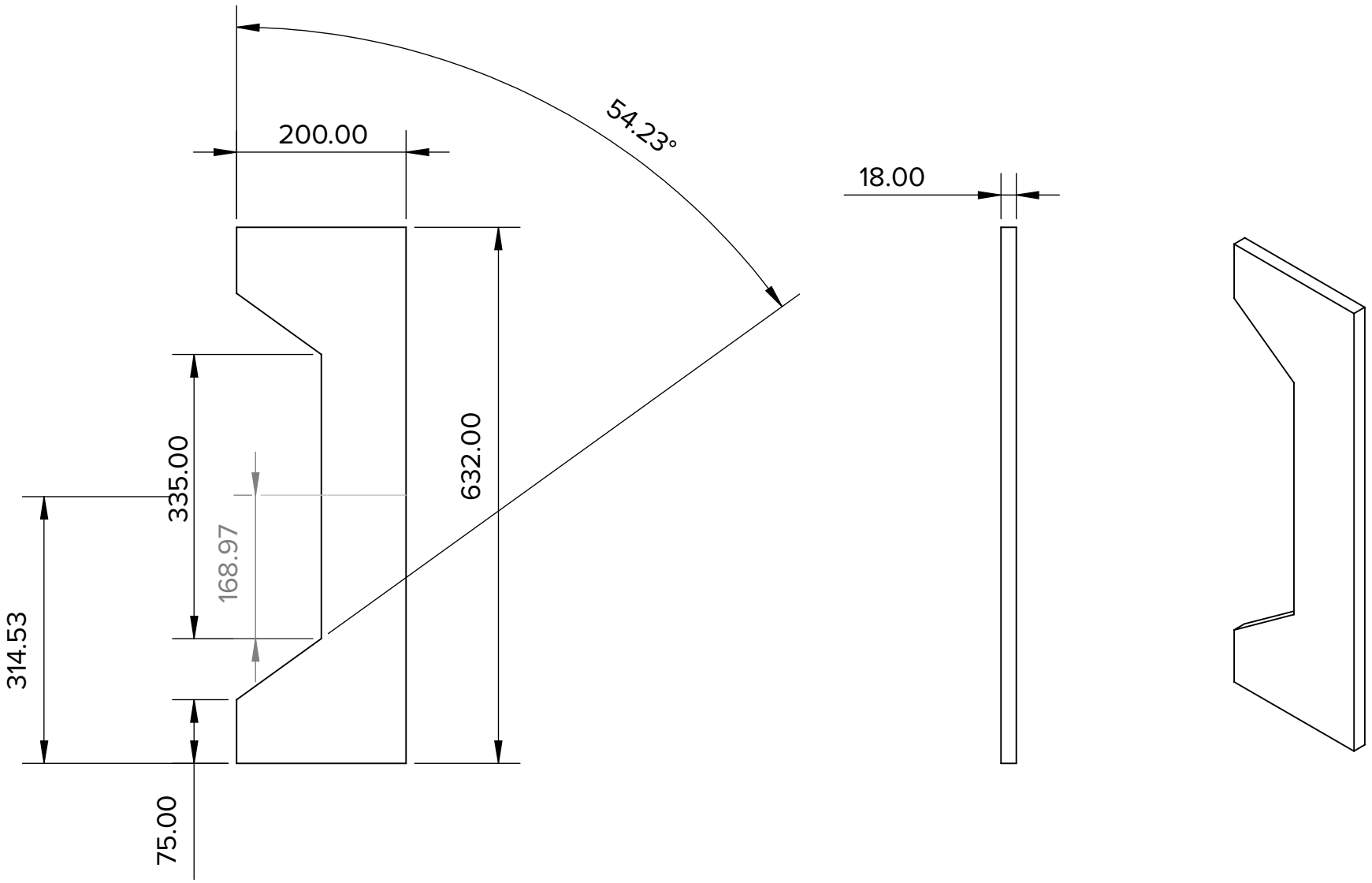
FANE

PROJECT: **Fane 221XS Dual 21” Reflex Cab**	PART: **D. Back Panel**				
NOTES:	REVISION: **Rev.1A**	SCALE:	DIMENSIONS: MM TOLERANCE LINEAR ± 0.4, HOLES +0.1/-0.0, NONE - CUMULATIVE	SHEET: 16 OF 24	



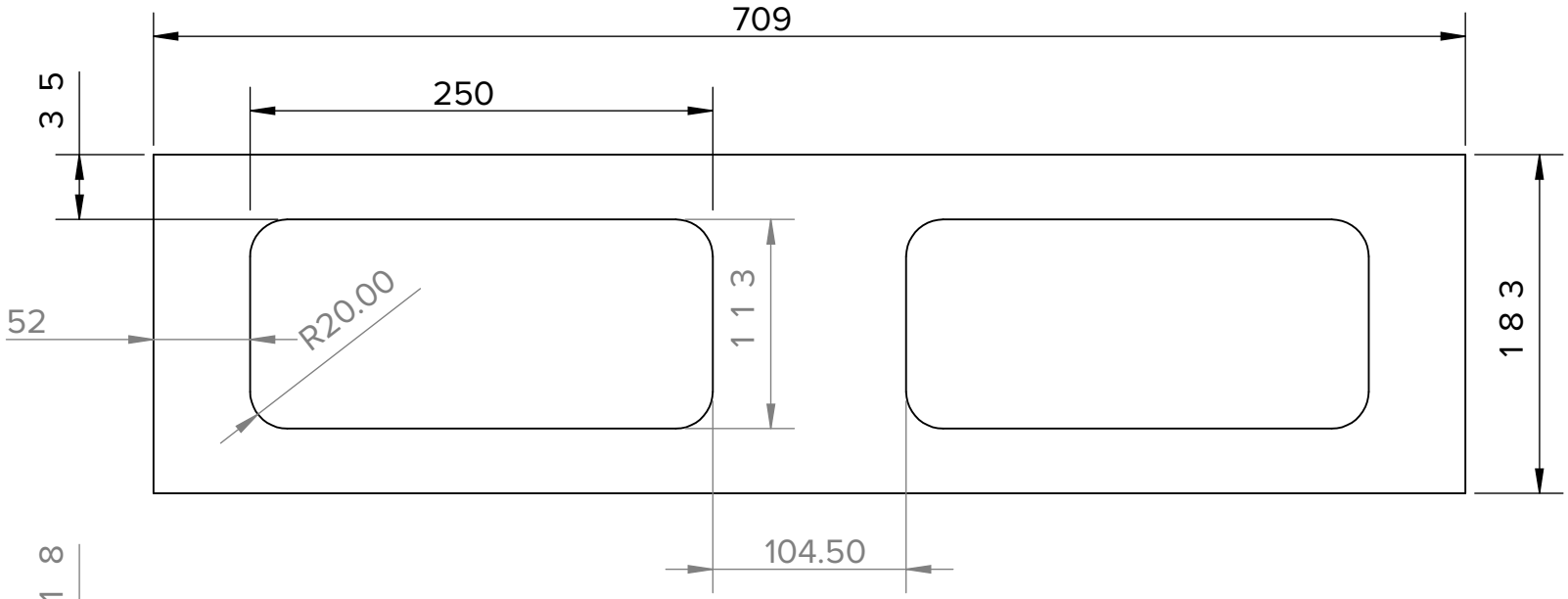
FANE

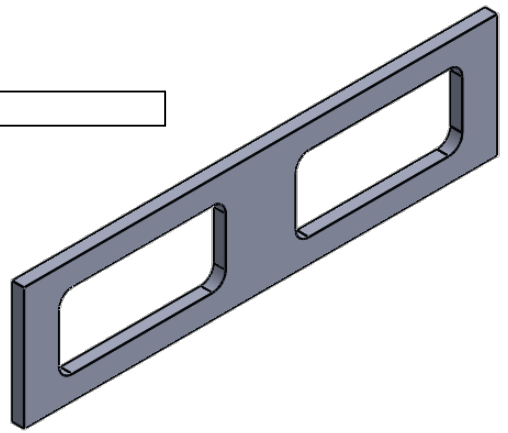
PROJECT:	PART:			
Fane 221XS Dual 21” Reflex Cab	**E. Top and Bottom Panels**			
NOTES:	REVISION:	SCALE:	DIMENSIONS:	SHEET:
2 Required	**Rev.1A**		MM TOLERANCE LINEAR ± 0.4, HOLES +0.1/-0.0, NONE - CUMULATIVE	17 OF 24



FANE

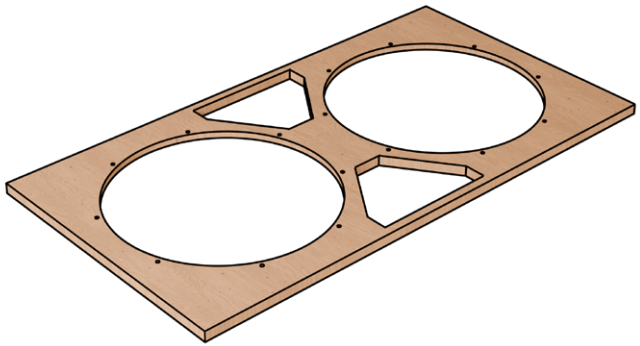
PROJECT:	PART:				
Fane 221XS Dual 21” Reflex Cab	F. Brace Panels				
NOTES:	REVISION:	SCALE:	DIMENSIONS:		SHEET:
4 Required	Rev.1A		MM	TOLERANCE LINEAR ± 0.4, HOLES +0.1/-0.0, NONE - CUMULATIVE	18 OF 24

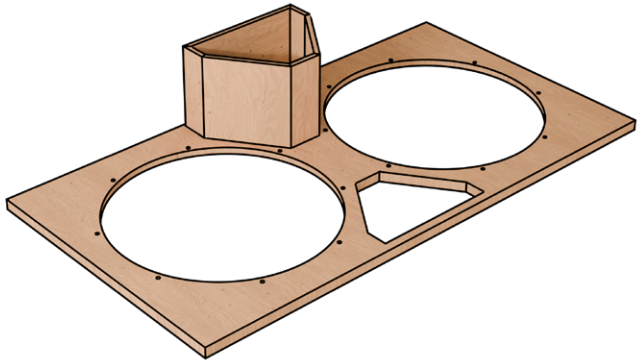


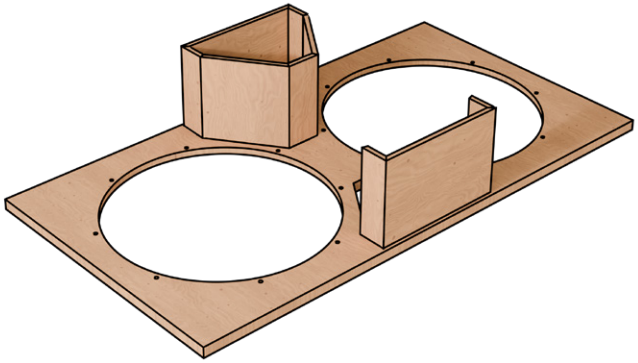


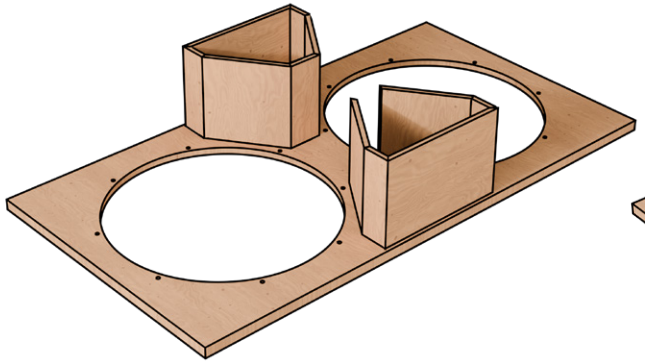
FANE

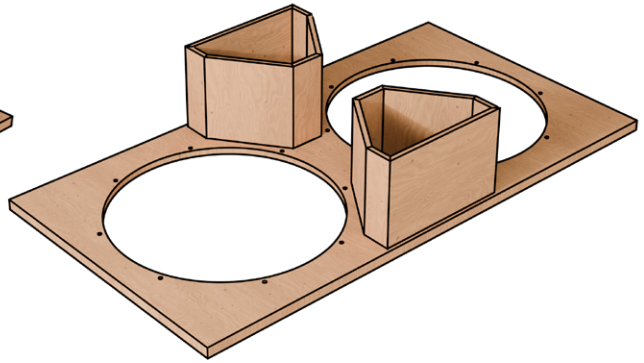
PROJECT: Fane 221XS Dual 21” Reflex Cab	PART: F. Front/ Rear Cross-brace Panel				
NOTES: 4 Required	REVISION: Rev.1A	SCALE:	DIMENSIONS: MM TOLERANCE LINEAR ± 0.4, HOLES +0.1/-0.0, NONE - CUMULATIVE	SHEET: 19 OF 24	





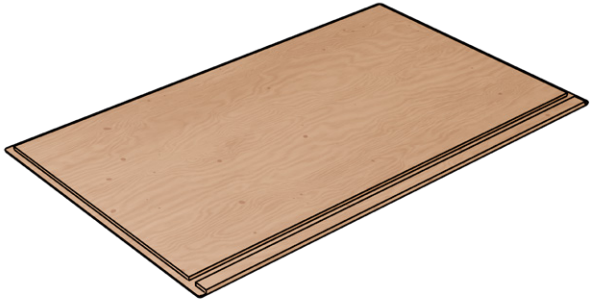


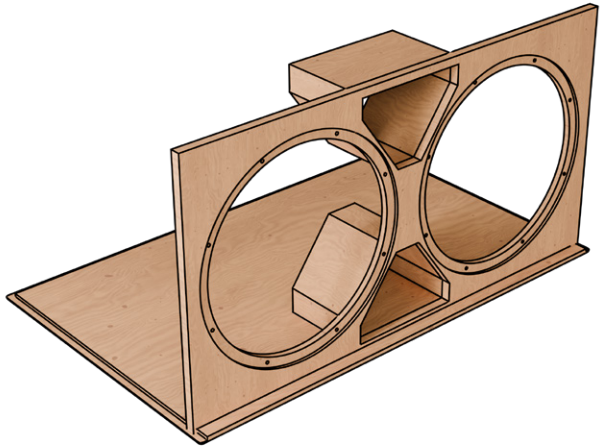


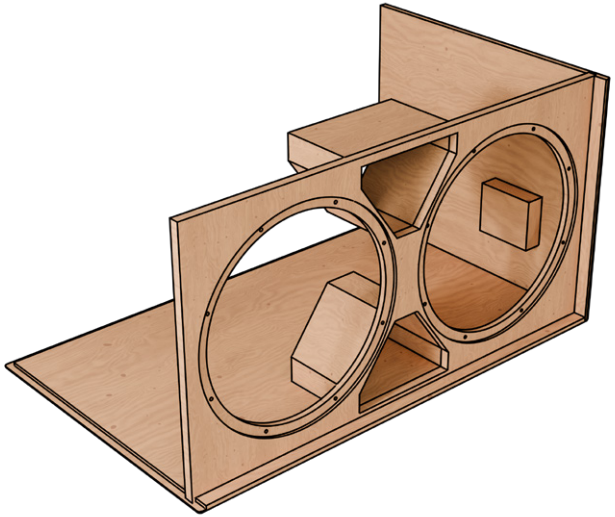


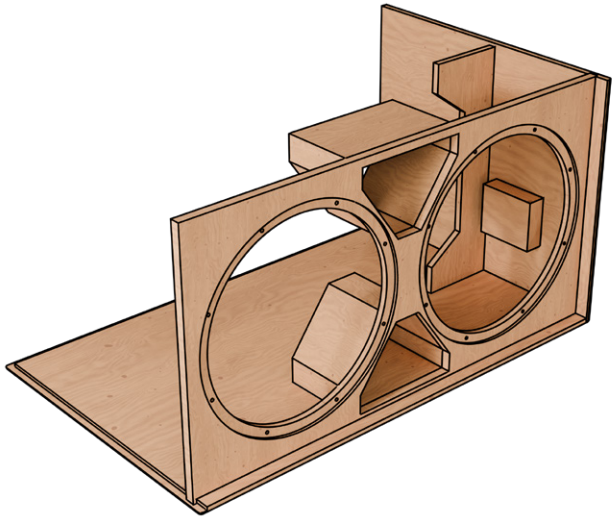
FANE

PROJECT: **Fane 221XS Dual 21” Reflex Cab**			PART: **Assembly Views**		
NOTES:	REVISION: **Rev.1A**	SCALE:	DIMENSIONS: MM TOLERANCE LINEAR ± 0.4, HOLES +0.1/-0.0, NONE - CUMULATIVE	SHEET: 20 OF 24	



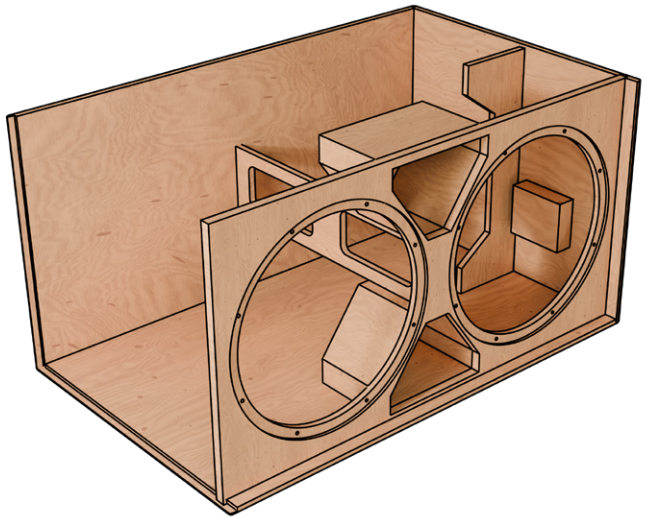


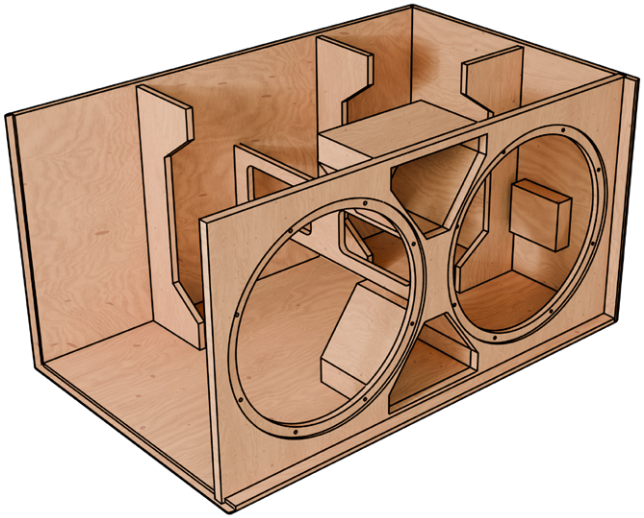


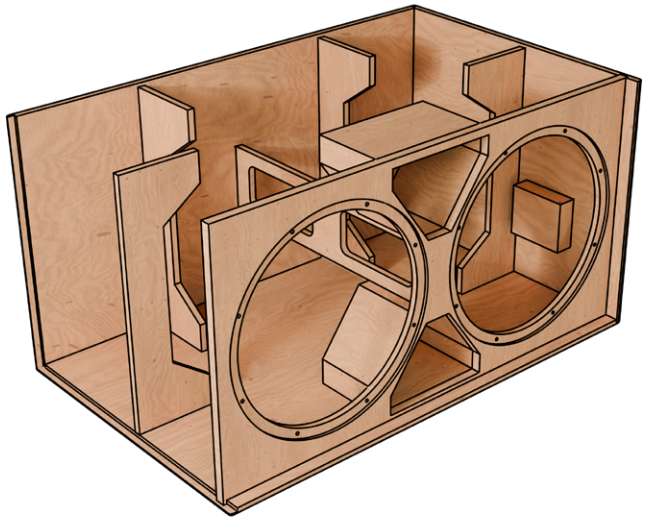


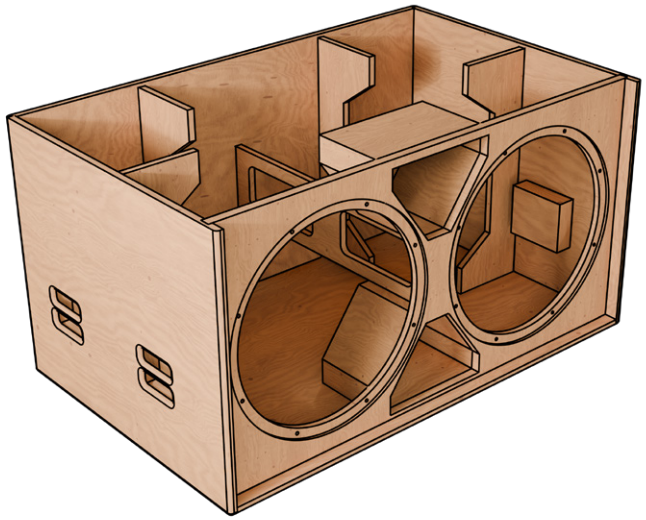
FANE

PROJECT: **Fane 221XS Dual 21” Reflex Cab**	PART: **Assembly Views**				
NOTES:	REVISION: **Rev.1A**	SCALE:	DIMENSIONS: MM TOLERANCE LINEAR ± 0.4, HOLES +0.1/-0.0, NONE - CUMULATIVE	SHEET: 21 OF 24	





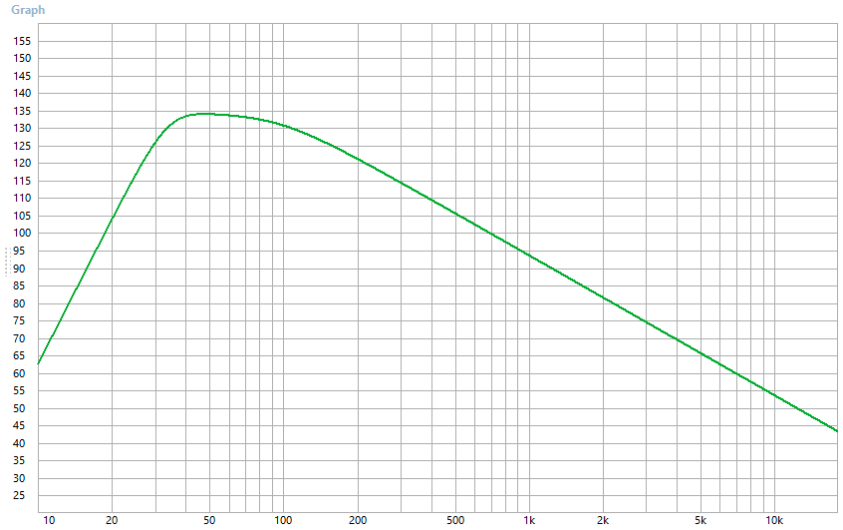




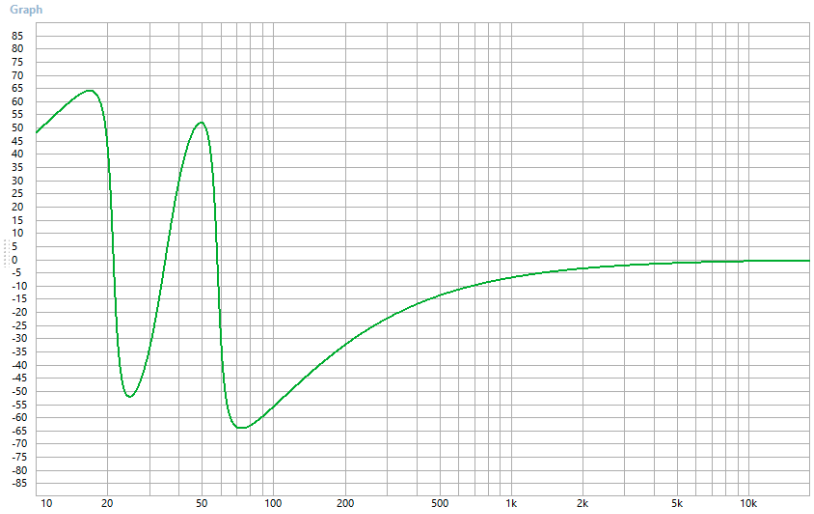
FANE

PROJECT: **Fane 221XS Dual 21” Reflex Cab**	PART: **Assembly Views**				
NOTES:	REVISION: **Rev.1A**	SCALE:	DIMENSIONS: MM TOLERANCE LINEAR ± 0.4, HOLES +0.1/-0.0, NONE - CUMULATIVE	SHEET: 22 OF 24	

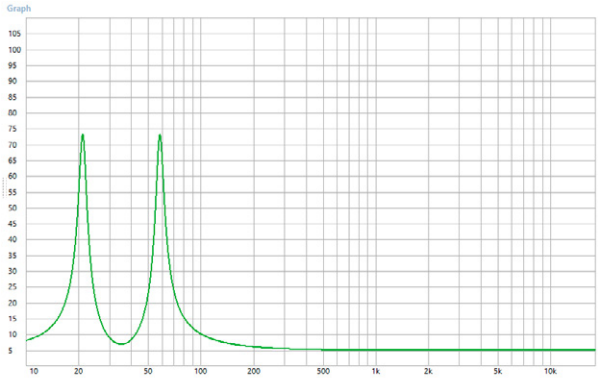
Predicted Bass Response (Colossus Prime 21XS)



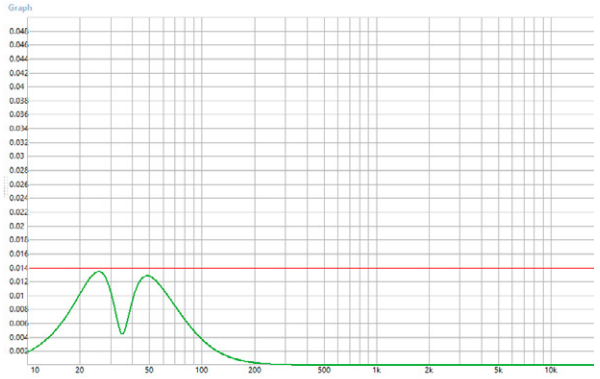
Phase Chart (Colossus Prime 21XS)



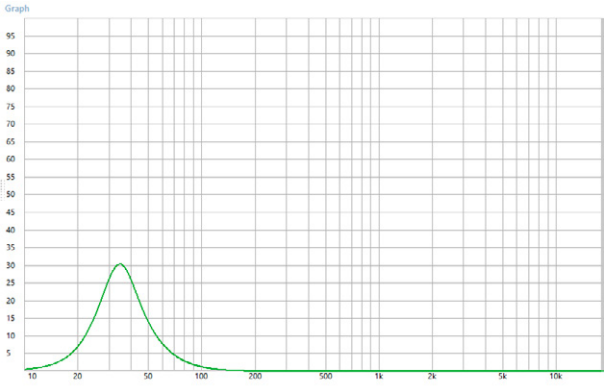
Impedance (Colossus Prime 21XS)



Cone Displacement (Colossus Prime 21XS)



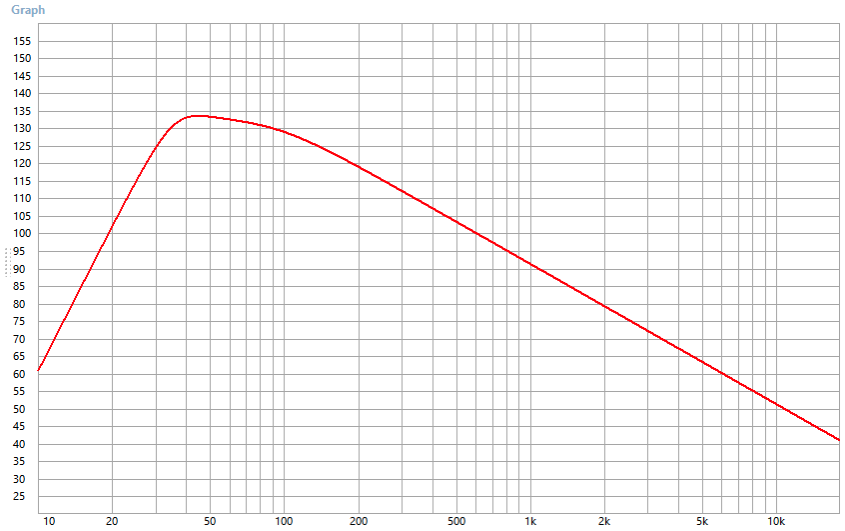
Vent Air Velocity (Colossus Prime 21XS)



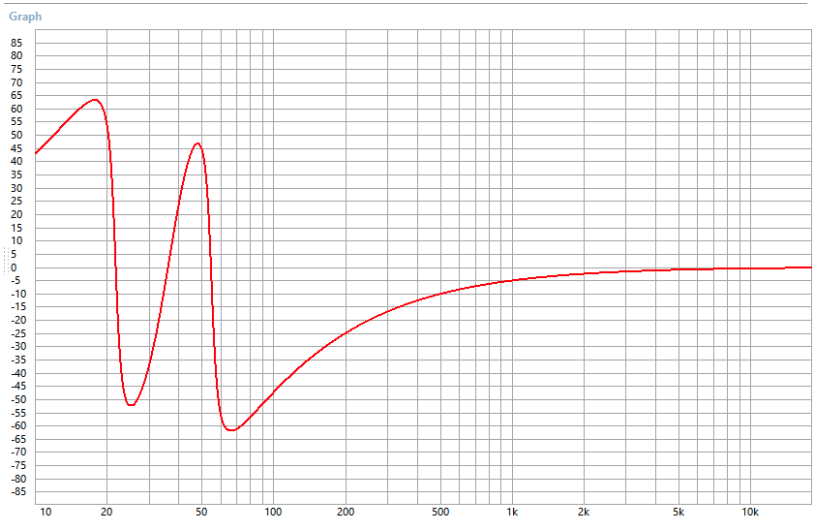
FANE

PROJECT: **Fane 221XS Dual 21” Reflex Cab**	PART: **Measurements**				
NOTES:	REVISION: **Rev.1A**	SCALE:	DIMENSIONS: MM TOLERANCE LINEAR ± 0.4, HOLES +0.1/-0.0, NONE - CUMULATIVE	SHEET: 23 OF 24	

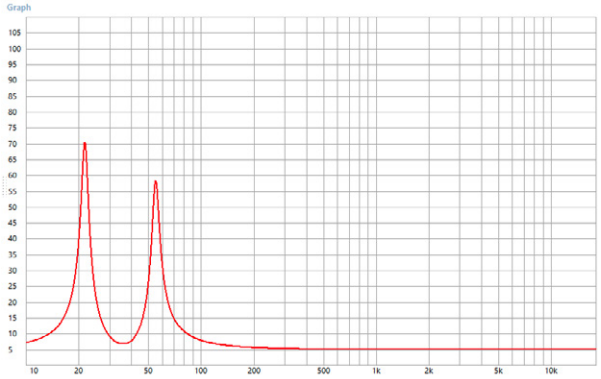
Predicted Bass Response (Colossus Prime 21NDXL)



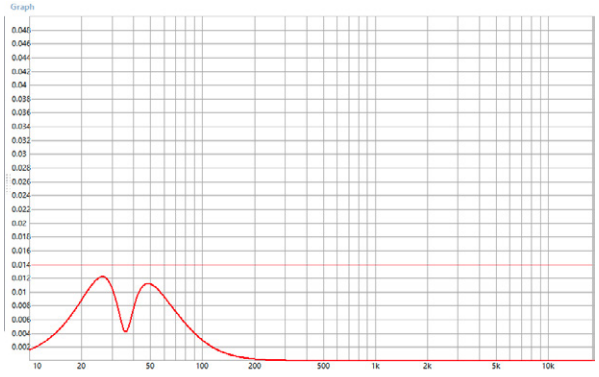
Phase Chart (Colossus Prime 21NDXL)



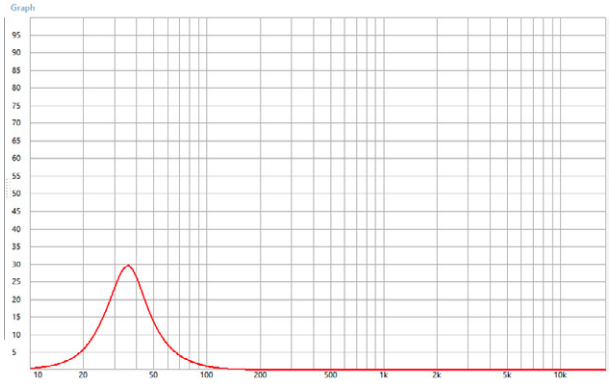
Impedance (Colossus Prime 21NDXL)



Cone Displacement (Colossus Prime 21NDXL)



Vent Air Velocity (Colossus Prime 21NDXL)



FANE

PROJECT: Fane 221XS Dual 21” Reflex Cab	PART: Measurements			
NOTES:	REVISION: Rev.1A	SCALE:	DIMENSIONS: MM TOLERANCE LINEAR ± 0.4, HOLES +0.1/-0.0, NONE - CUMULATIVE	SHEET: 24 OF 24