ANODYNE ELECTRONICS MANUFACTURING CORP.

SPECIAL NOTICE

This product is now licensed to Anodyne Electronics Manufacturing (AEM) from Northern Airborne Technology (NAT). AEM is responsible for all matters related to this product, including sales, support and repair services.

Please note the transition to convert product manuals and supporting documentation is an ongoing process and is being addressed on an ‘as needed’ basis.

All references to NAT product part numbers (and associated images) are equivalent to AEM product part numbers.

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SM35

PA110/220
High Power Audio Amplifiers

INSTALLATION AND OPERATION MANUAL

Rev: 2.01 August 02, 2016

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The status of this installation and operation manual is controlled by issue shown on the title page. The status of each section is controlled by revision shown in the footer of each page. All revisions affecting sections of this manual have been incorporated into the latest issue.

ISSUE/REVISION RECORD			
Manual Issue Number	**Section Revision Number**	**Revision Description**	**Issue Date**
4.00	n/a	Manual split into two sections	May 15, 2006
4.01	Section 1 Rev: 1.00 Section 2 Rev: 1.00 Section 3 Rev: 1.00	Rewritten in latest format New Interconnect drawings	Sep 24, 2008
AEM MANUAL REVISIONS			
Section	**Revision Number**	**Revision Description**	**Date**
All	Rev 2.01	Updated Section 2.4.5.2 (RAS#551)	August 02, 2016
All	Rev 2.00	Updated drawings and format	April 22, 2012

Table of Contents

Section 1.0 Description

1.1 Introduction

Information in this section consists of product description, design features and specifications for the PA110/220 High Power Audio Amplifiers. All derivative product information shall be contained in the applicable manual supplement, which may be obtained from AEM as required.

Review all notes, warning and cautions.

1.2 Product Description

The PA110 and PA220 High Power Audio Amplifiers are remote mounted modular amplifiers capable of producing 110 W of output power, and can be used in conjunction with AEM's Loudhailer/Siren systems.

Lower power systems (30 W) are usually used for sling load control and local external paging in smaller airframes, or internal rear paging in larger airframes. Higher power systems (110 W and up) are used for law enforcement and long distance external paging applications. The PA110/220 can be chained into multiple installations, allowing up to half a kilowatt of audio to be controlled by a single panel mounted controller.

1.3 Design Features

Provision is made for external power switching to activate PA110 and PA220 High Power Audio Amplifiers for increased power output.

All external interconnects, switches and relay contacts are gold plated for maximum reliability. Switches and relays are sealed. G10-FR flame retardant circuit boards are postcoated for maximum moisture resistance and corrosion prevention. Relays are sealed, high vibration rated (50g shock) and dry nitrogen filled.

1.4 Specifications

1.4.1 Electrical Specifications

1.4.1.1 PA110

Power	+28 Vdc nominal at 5.5 A max; Idle current less than 0.1 A
Low Level Input	Impedance 600 Ω ±5%
High Level Input	Impedance 300 Ω ±5%
Output	100 W nominal @ 1kHz into 10 Ω, Transformer coupled

1.4.1.2 PA220

Power	+28 Vdc nominal at 10 A max; Idle current less than 0.1 A
Low Level Input	Impedance 600 Ω ±5%
High Level Input	Impedance 300 Ω ±5%
Output	2 x 100 W nominal @ 1kHz into 10 Ω, Transformer coupled

1.4.2 Physical Specifications

Height	4.10” (104.1 mm)
Depth	6.32” (160.5 mm) excluding mating connector
Width	7.90” (200.7 mm)
Mounting	Bulkhead, using 4 x AN3 bolts
Weight:	
PA110	4.6 lbs (2.09 kg) excluding mating connector
PA220	7.75 lbs (3.52 kg) excluding mating connector

1.4.3 Environmental Specifications

Temperature	-45° C to +50° C (Ambient)
Altitude	25,000 ft. Maximum

1.5 Unit Nomenclature

The following list indicates the models available at the date of publication of this document. Other models may be available.

Model	Description / Distinction
PA110-015	High and low level inputs Optional audio key input Remote power keying Power and level indicators Local level adjustment Used with AA21 and AA22 controllers

PA220-010	High and low level inputs Optional audio key input Remote power keying Dual level indicators and level adjustment Dual 110 W outputs with individual control and fusing for full redundancy Mechanically interchangeable with PA110-015 (different interconnect) Used with AA21 and AA22 controllers

End of Section 1.0

Section 2.0 Installation

2.1 Introduction

Information in this section consists of unpacking and inspection procedures, installation procedures, post-installation checks and installation drawings for the PA110/220 High Power Audio Amplifiers.

Review all notes, warnings and cautions.

2.2 Unpacking and Inspection

Unpack the equipment carefully. Inspect the unit visually for damage due to shipping and report all such claims immediately to the carrier involved. Check that all items listed below are present before proceeding and report any shortage immediately to your supplier:

- PA110/220 High Power Audio Amplifier
- Product Information Card
- Certificate of Conformity or Release Certification

2.2.1 Warranty

All Anodyne Electronics Manufacturing Corp. (AEM) products are warranted for 2 years. See the website www.aem-corp.com/warranty for complete details.

2.3 Continued Airworthiness

Maintenance of the PA110/220 is ‘on condition’ only. Periodic maintenance of this product is not required.

2.4 Installation Procedures

2.4.1 Warnings

WARNING:

Never ground any output line from the unit or permanent damage may result. Use of a fully floating audio wattmeter or transformer coupled meter is recommended. Always check ADF and compass calibration after installing external speakers or ‘PA’ amplifiers. Significant single cycle errors may be caused by the concentration of steel and magnetic material. **Do not** bundle any lines from these units with transmitter coax lines. **Do not** bundle any lines from this unit with 400 Hz synchro wiring, or AC power lines.

2.4.2 Cautions

CAUTION:
Use shielded cable exactly as shown and **ground as indicated**. All audio installations can be severely degraded by incorrect wiring and shielding. Unusual buzzes, hums or other background audio are symptomatic of multiple grounds, or noisy external systems such as blowers or pumps sharing wiring with the audio system. Never operate any of the PA amps below their rated impedance of 10 Ω, except as indicated for the PA110.

2.4.3 Cabling and Wiring

All wire shall be selected in accordance with the original aircraft manufacturer's Maintenance Instructions or AC43.13-1B Change 1, Paragraphs 11-76 through 11-78. Unshielded wire types shall qualify to MIL-W-22759 as specified in AC43.13-1B Change 1, Paragraphs 11-85, 11-86, and listed in Table 11-11. For shielded wire applications, use Tefzel MIL-C-27500 shielded wire with solder sleeves (for shield terminations) to make the most compact and easily terminated interconnect. Follow the connector map in Section 2.6 as required.

Allow 3" from the end of the shielded wiring to the shield termination to allow the connector hood to be easily installed. Reference the interconnect drawing in Section 2.6 for shield termination details. Note that the hood is a "clamshell" hood, and is installed after the wiring is complete. Aircraft harnessing shall permit the unit to be removed from the panel for easy access.

Maintain wire segregation and route wiring in accordance with the original aircraft manufacturers Maintenance Instructions.

Unless otherwise noted, all wiring shall be a minimum of 22 AWG, except power and ground lines, which shall be a minimum of 16 AWG, and speaker wires which should be at least 18 AWG. Reference the Interconnect drawing for additional specifications. Check that the ground connection is clean and well secured, and that it shares no path with any electrically noisy aircraft accessories such as blowers, turn and bank instruments or similar loads. Power to this unit must be supplied from a separate circuit breaker or fuse (fast blow), and not attached to any other circuit breaker without additional protection. Verify that the selected circuit breaker size and wire gauge are adequate for the installation using the techniques specified in AC43.13-1B Change 1, Paragraphs 11-47 through 11-51 and 11-66 through 11-69.

2.4.4 External Switches

If the PA110 is driven directly from an AA90 controller via an amplifier, or if for any reason an AA21/22 is not used, then a remote power switch (to disable the PA amp) may be desired.

2.4.5 Post Installation Checks

2.4.5.1 Voltage/resistance checks

Do not attach the power amplifier until the following conditions are met.

PA110

Check the following:

a) P101 pins **<6>, <18>** and **<19>** for +28 Vdc relative to ground.
b) P101 pins **<4>, <5>** and **<17>** for continuity to ground (below 0.5 Ω).
c) Speaker connections are correct for the speaker impedance, and are not shorted.

PA220

Check the following:

a) P101 pins **<6>, <24>** and **<25>** for +28 Vdc relative to ground.
b) P101 pins **<4>, <5>** and **<23>** for continuity to ground (below 0.5 Ω).
c) Speaker connections are correct for the speaker impedance, and are not shorted.

2.4.5.2 Power On checks

a) Install the power amplifier and power up the aircraft's systems. Turn on all of the radios and other accessories required for this system. Check that the **PWR** 'on' LED on the PA110 illuminates when the power switch is up. When the PA220 is powered on, listen for the Power Relay energizing in the PA. This will indicate that power is being supplied to the unit and it is turned on.

b) Select the rest of the audio system as required to allow connection of the pilot's mic to the 'PA' and key the cyclic switch for transmit. Check for correct radio operation and note what volume settings will produce a suitable external paging level. Refer to the AA21 or AA22 Operator's Manual for more detailed instructions.

Note: A faint audio signal heard at the speaker (even when the system is not paging) is common due to the very high gain of this system and stray coupling in the wiring. It is not audible in flight.

Upon satisfactory completion of all performance checks, make all required log book entries, electrical load, weight and balance amendments and other documentation as required by your local regulatory agency before releasing the aircraft for service.

2.5 Accessories Required But Not Supplied

These units require installation kits to complete the installation.

2.5.1 PA110 Installation Kit (PA110-IKS)

Quantity	Description	AEM Part #
1	Connector, D-min 25 Socket Solder Cup	20-20-025
1*	Jack Screw Set	20-27-002
1*	Lock Clip set	20-27-004
1	25 Pin Connector Hood	20-29-026

* Use as required.

2.5.2 PA220 Installation Kit (PA220-IKS)

Quantity	Description	AEM Part #
1	Connector, D-min 37 Socket Solder Cup	20-20-037
1*	Jack Screw Set	20-27-002
1*	Lock Clip Set	20-27-004
1	37 Pin Connector Hood	20-29-038

* Use as required.

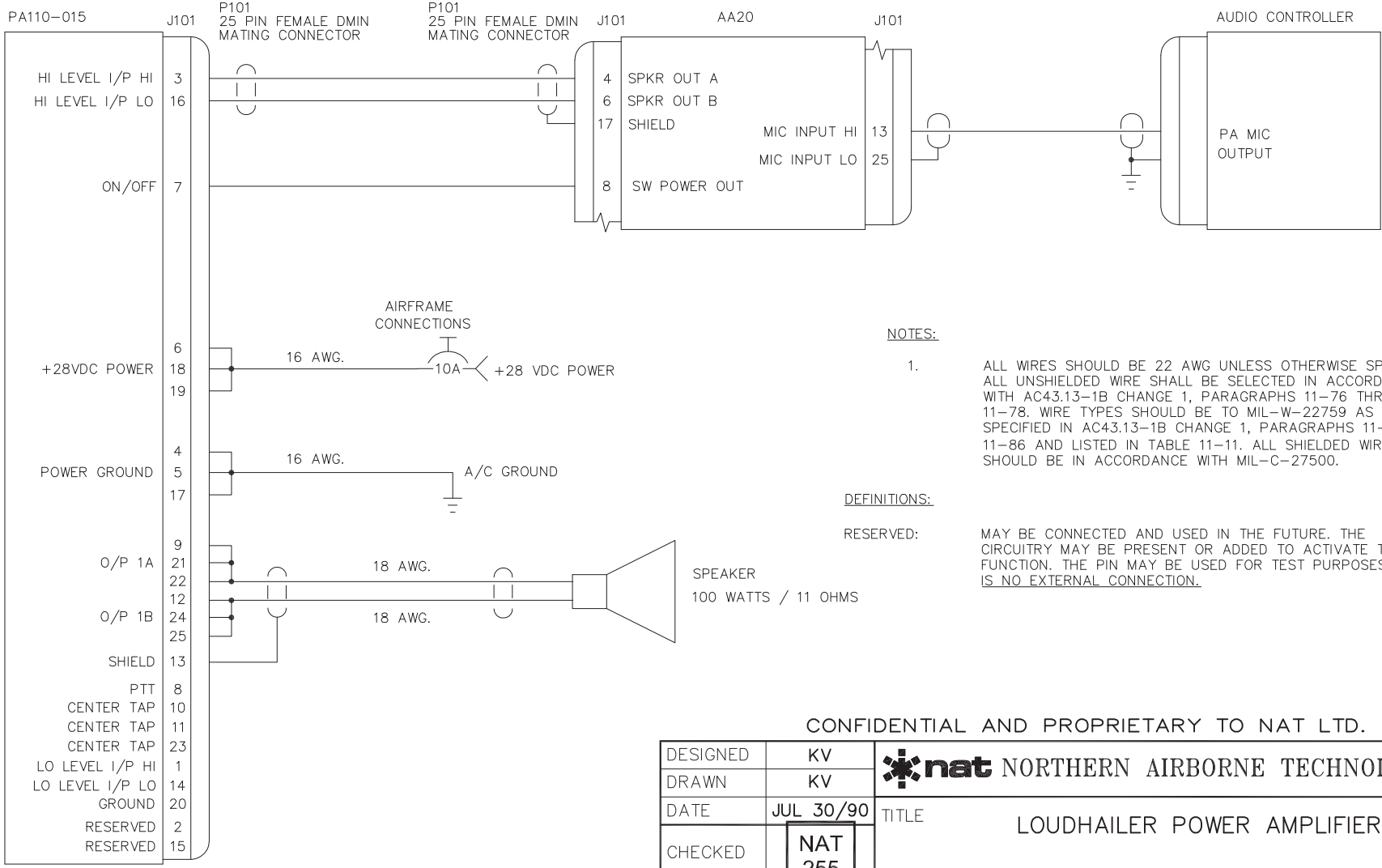
2.6 Installation Drawings

DRAWING	REV.	DESCRIPTION	TYPE
PA110-015			
PA110\015\403-0	1.11	Loudhailer Power Amplifier	Interconnect
PA110\015\403-1	1.11	Loudhailer Power Amplifier	Interconnect
PA110\015\405-0	1.02	Loudhailer Power Amplifier	Connector map
PA110\015\922-0	1.22	Loudhailer Power Amplifier	Mech Installation
PA220-010			
PA220\010\403-0	1.12	Loudhailer Power Amplifier	Interconnect
PA220\010\403-1	1.00	Loudhailer Power Amplifier	Interconnect
PA220\010\403-2	1.00	Loudhailer Power Amplifier	Interconnect
PA220\010\405-0	1.02	Loudhailer Power Amplifier	Connector map
PA220\010\922-0	1.22	Loudhailer Power Amplifier	Mech Installation

Section 2.0 ends following the above documents

PA110–015/AA20 EXTERNAL CONNECTIONS

REVISIONS			
REV	DESCRIPTION	DATE	BY
1.01	FORMAT CHANGES ONLY	MAR 26/98	TGM
1.10	REFER TO DOCCR02098 FOR DETAILS.	FEB 25/08	MWS
1.11	DOCCR02503 – CORRECTED AA22 CONNECTIONS ON SHEET 2.	MAY 8/08	TAT



NOTES:

1. ALL WIRES SHOULD BE 22 AWG UNLESS OTHERWISE SPECIFIED. ALL UNSHIELDED WIRE SHALL BE SELECTED IN ACCORDANCE WITH AC43.13–1B CHANGE 1, PARAGRAPHS 11–76 THROUGH 11–78. WIRE TYPES SHOULD BE TO MIL–W–22759 AS SPECIFIED IN AC43.13–1B CHANGE 1, PARAGRAPHS 11–85, 11–86 AND LISTED IN TABLE 11–11. ALL SHIELDED WIRE/CABLE SHOULD BE IN ACCORDANCE WITH MIL–C–27500.

DEFINITIONS:

RESERVED: MAY BE CONNECTED AND USED IN THE FUTURE. THE CIRCUITRY MAY BE PRESENT OR ADDED TO ACTIVATE THE FUNCTION. THE PIN MAY BE USED FOR TEST PURPOSES. THERE IS NO EXTERNAL CONNECTION.

DESIGNED	KV
DRAWN	KV
DATE	JUL 30/90
CHECKED	NAT 255
APPROVED	NAT 114
FILE	403–0.DWG

NORTHERN AIRBORNE TECHNOLOGY LTD.

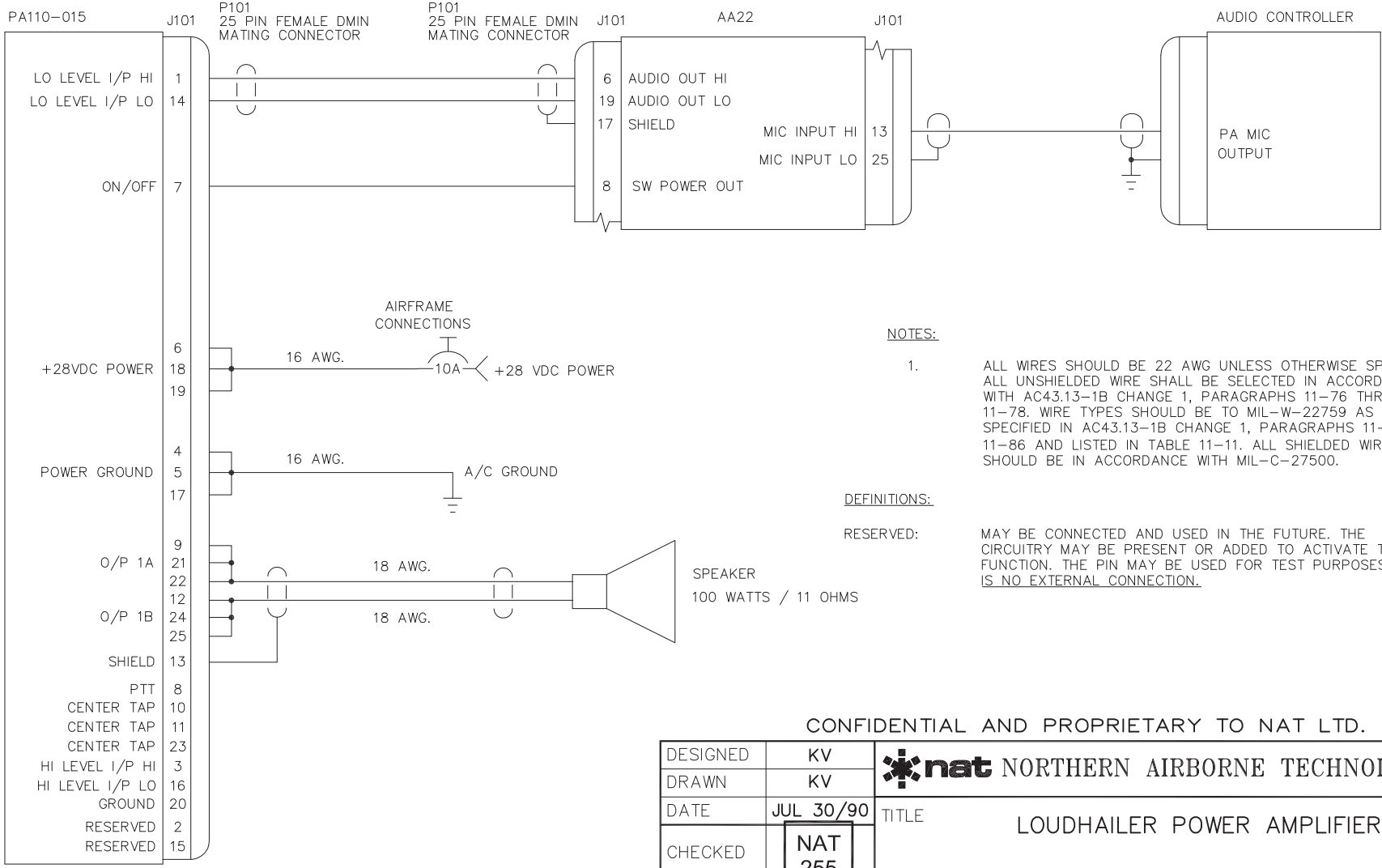
TITLE: LOUDHAILER POWER AMPLIFIER

SIZE	CAGE CODE	PART NO.	REV.	SHEET
A	3AB01	PA110–015	1.11	1/2

DWG. TYPE: INTERCONNECT

DWG. NO. PA110\015\403–0

PA110–015/AA22 EXTERNAL CONNECTIONS



NOTES:

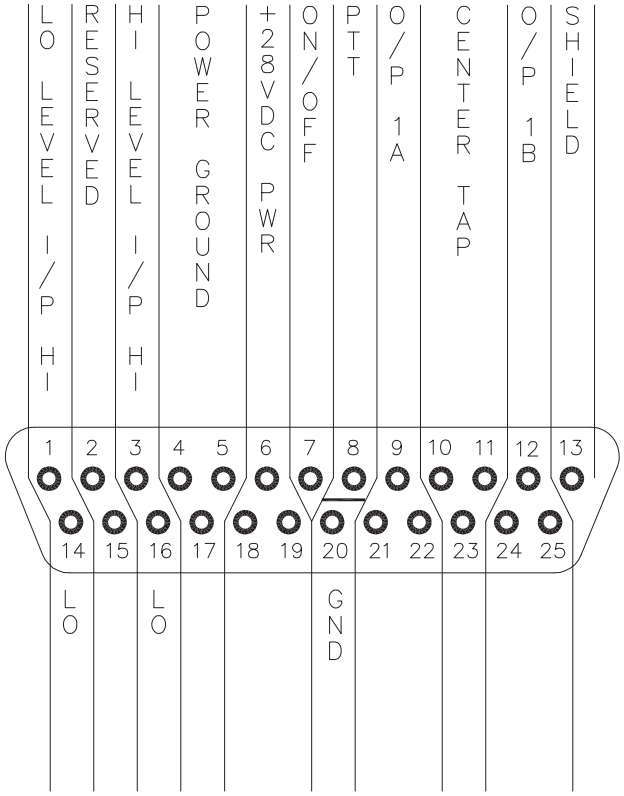
1. ALL WIRES SHOULD BE 22 AWG UNLESS OTHERWISE SPECIFIED. ALL UNSHIELDED WIRE SHALL BE SELECTED IN ACCORDANCE WITH AC43.13–1B CHANGE 1, PARAGRAPHS 11–76 THROUGH 11–78. WIRE TYPES SHOULD BE TO MIL–W–22759 AS SPECIFIED IN AC43.13–1B CHANGE 1, PARAGRAPHS 11–85, 11–86 AND LISTED IN TABLE 11–11. ALL SHIELDED WIRE/CABLE SHOULD BE IN ACCORDANCE WITH MIL–C–27500.

DEFINITIONS:

RESERVED: MAY BE CONNECTED AND USED IN THE FUTURE. THE CIRCUITRY MAY BE PRESENT OR ADDED TO ACTIVATE THE FUNCTION. THE PIN MAY BE USED FOR TEST PURPOSES. THERE IS NO EXTERNAL CONNECTION.

DESIGNED	KV	nat NORTHERN AIRBORNE TECHNOLOGY LTD.				
DRAWN	KV					
DATE	JUL 30/90	TITLE LOUDHAILER POWER AMPLIFIER				
CHECKED	NAT 255					
APPROVED	NAT 114	SIZE A	CAGE CODE 3AB01	PART NO. PA110–015	REV. 1.11	SHEET 2/2
FILE 403–0.DWG		DWG. TYPE INTERCONNECT		DWG. NO. PA110\015\403–1		

REVISIONS			
REV	DESCRIPTION	DATE	BY
1.01	FORMAT CHANGES ONLY	AUG 19/95	PL
1.02	FORMAT CHANGES ONLY	MAR 24/98	TGM

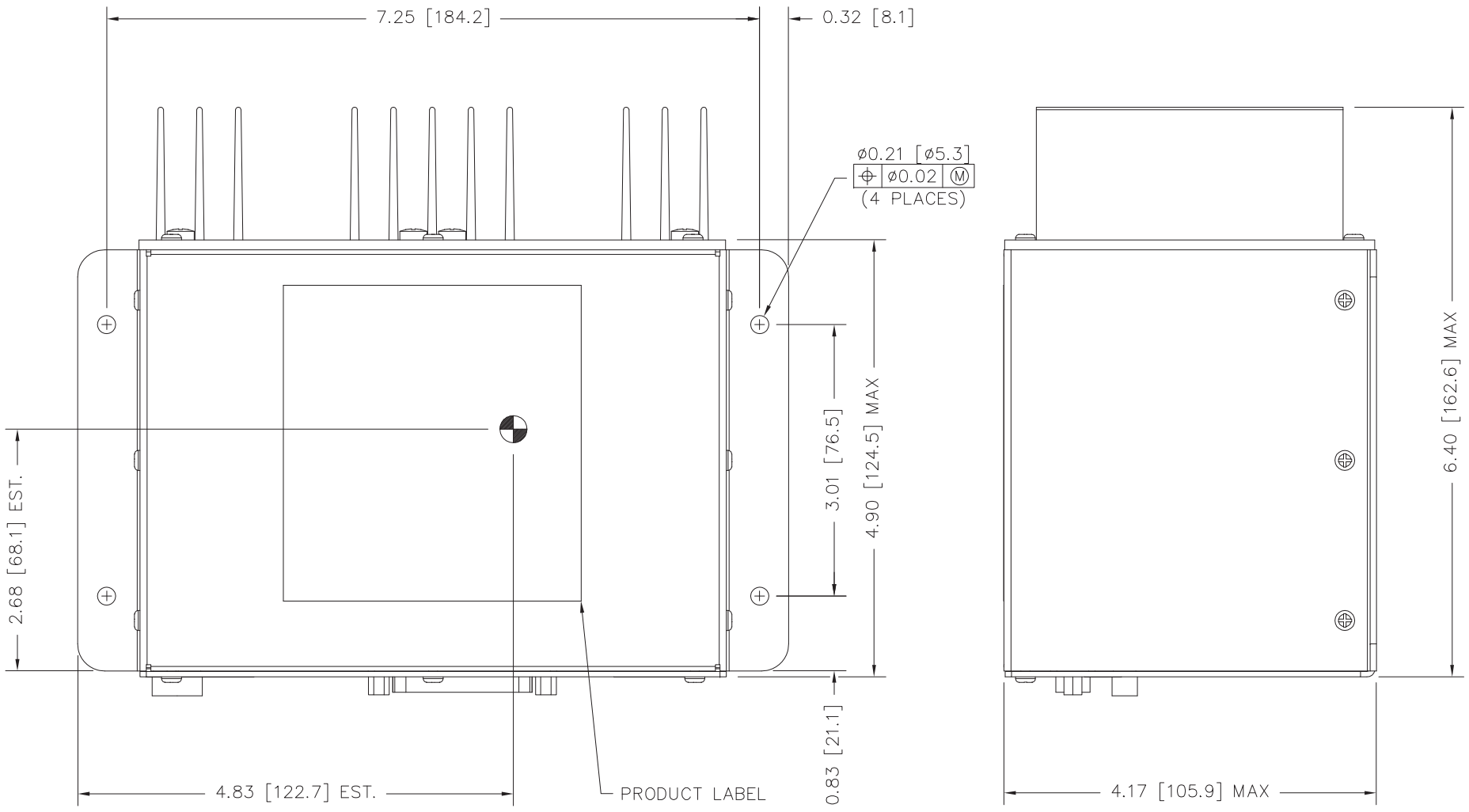


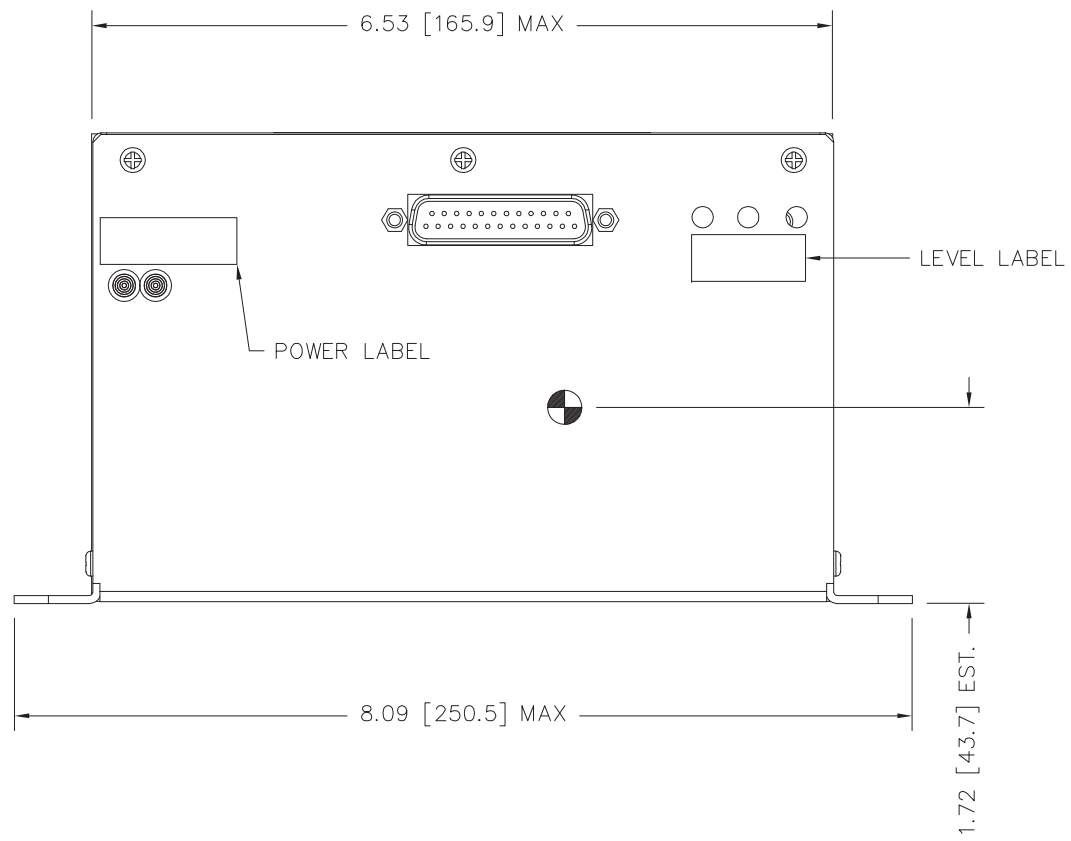
P101
FEMALE 25 PIN D–MIN
MATING CONNECTOR

VIEW IS FROM REAR OF AIRFRAME CONNECTOR

DESIGNED	KV	NORTHERN AIRBORNE TECHNOLOGY LTD.				
DRAWN	KV					
DATE	NOV 12/85	TITLE: LOUDHAILER POWER AMPLIFIER				
CHECKED	NAT PROD. 130					
APPROVED	NAT 214 / NAT 107	SIZE: A	CAGE CODE: 3AB01	PART NO.: PA110–015	REV.: 1.02	SHEET: 1/1
FILE: 405–0102.DWG		DWG. TYPE: CONNECTOR MAP		DWG. NO.: PA110\015\405–0		

REVISIONS			
REV	DESCRIPTION	DATE	BY
1.10	REDESIGN, ADJUSTMENTS AND CONNECTORS MOVED.	NOV 24/94	TGM
1.11	MOUNTING HOLES MOVED.	OCT 27/95	TGM
1.12	C OF G AND WEIGHT ADDED, FORMAT CHANGES.	APR 3/98	TGM
1.20	ECR #1708 – LABEL UPDATED, FORMAT CHANGES.	JAN 23/04	TAT
1.21	DOCCR01066 – DIM CORRECTIONS, FORMAT CHANGES.	APR 12/06	MWS
1.22	ECR#10026 – REPOSITION CONNECTOR.	MAR 31/09	MWS





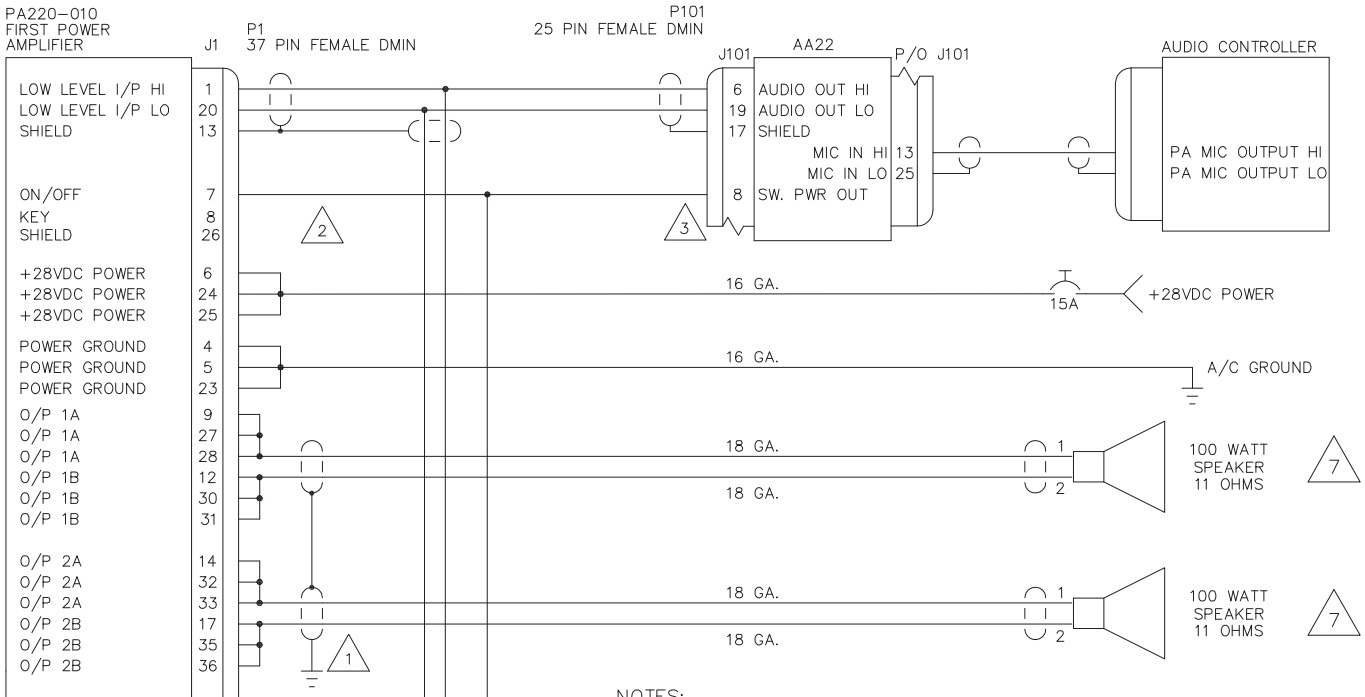
NOTES:
1. DIMENSIONING AND TOLERANCING IN ACCORDANCE WITH ASME Y14.5M–1994

CENTER OF GRAVITY

CONFIDENTIAL AND PROPRIETARY TO NAT LTD.

TOLERANCES UNLESS STATED OTHERWISE 0.X=+/–0.030 0.XX=+/–0.010 0.XXX=+/–0.005 0.XXXX=+/–0.002 ANGLE=+/– 0.5 DEG.	DIMENSIONS IN INCHES THIRD ANGLE PROJECTION	DESIGNED	KV	nat NORTHERN AIRBORNE TECHNOLOGY LTD.			
		DRAWN	TGM				
		DATE	FEB 17/98	TITLE	LOUDHAILER POWER AMPLIFIER		
		CHECKED	NAT 231 / NAT 255				
MASS: 4.83 lbs. (2.2 Kg)		APPROVED	NAT 129	SIZE B	CAGE CODE 3AB01	PART NO. PA110–015	REV. 1.22 / SHEET 1/1
MATERIAL: –							
FINISH: POWDER COATING		FILE	922–0.DWG	DWG. TYPE	MECH. INSTALLATION	DWG. NO.	PA110\015\922–0

REVISIONS			
REV	DESCRIPTION	DATE	BY
B	FORMAT CHANGES.	OCT 13/93	KV
1.11	ADDED NOTES 1–3, FORMAT CHANGES	DEC 20/94	KV
1.12	ECR #1397 – RENUMBERED NOTES, FORMAT CHANGES.	APR 3/03	TAT



NOTES:

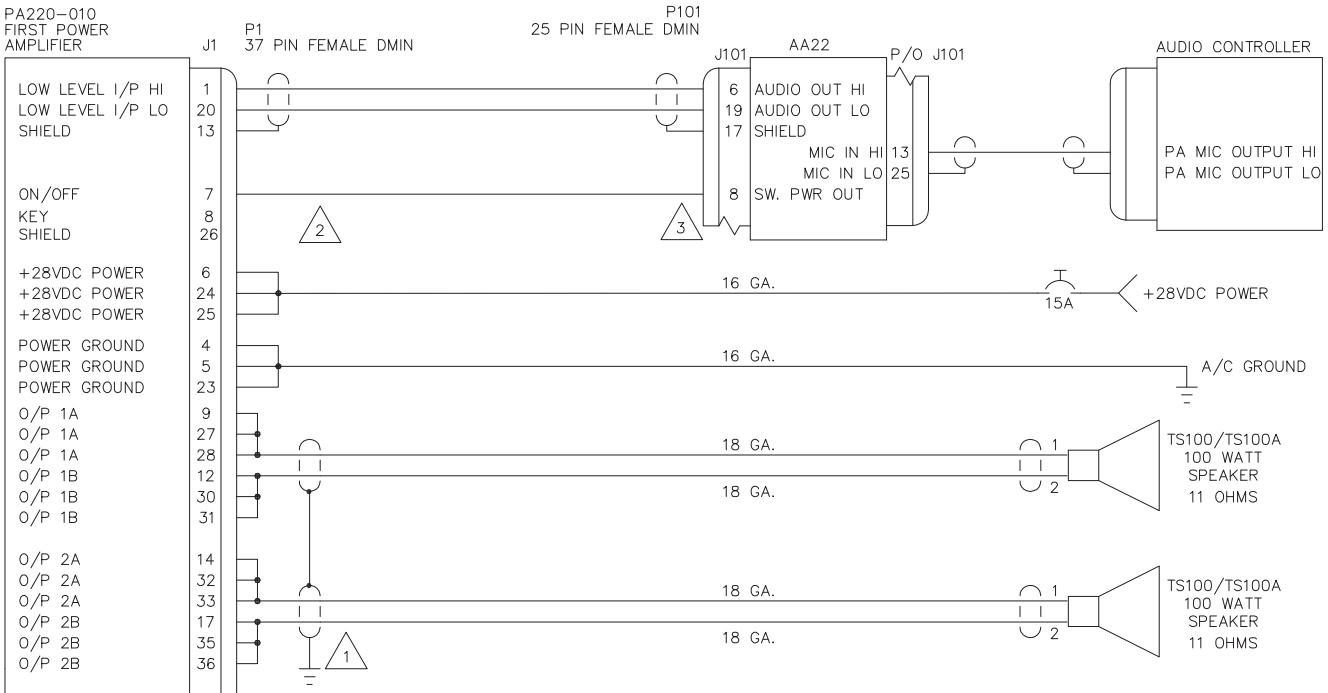
1. LOCAL AIRFRAME GROUND. MAX. LENGTH 3 FEET.
2. CONTACT FACTORY FOR INSTALLATION OPTION.
3. OLDER UNITS USE PINS 4 & 5
4. UNLESS OTHERWISE SPECIFIED USE TEFZEL MIL–M–27500, MIL–M–22759 OR MIL–M–81044 SHIELDED WIRE WITH SOLDER SLEEVES.
5. ALL WIRE 22 AWG UNLESS OTHERWISE NOTED.
6. ALL REMAINING CONNECTIONS ARE SIMILIAR TO FIRST POWER AMPLIFIER:
   POWER VIA A SECOND 10AMP BREAKER,
   GROUND VIA AIRCRAFT GROUND.
   SECOND SPEAKER PAIR CONNECTED TO OUTPUT 1 & 2 OF PA220–010 #2 RESEPECTIVELY.
7. USE EITHER 2 x TS100xx OR 1 x TS200xx.

DEFINITIONS:

N/C: NO CONNECTION. THE PIN IS NOT CONNECTED TO ANYTHING INTERNALLY, AND THEREFORE SHALL HAVE NO CONNECTION EXTERNALLY.

RESERVED: MAY BE CONNECTED AND USED IN THE FUTURE. THE CIRCUITRY MAY BE PRESENT OR ADDED TO ACTIVATE THE FUNCTION. THE PIN MAY BE USED FOR TEST PURPOSES. THERE IS NO EXTERNAL CONNECTION.

DESIGNED	KV	NORTHERN AIRBORNE TECHNOLOGY LTD.				
DRAWN	KV					
DATE	JUL 23/90	TITLE: LOUDHAILER POWER AMPLIFIER 2 x 200 WATT CONFIGURATION WITH AA22 PA/SIREN SYSTEM				
CHECKED	NAT 114 / NAT 255					
APPROVED	NAT 107	SIZE: A	CAGE CODE: 3AB01	PART NO.: PA220–010	REV.: 1.12	SHEET: 1/1
FILE: 403–0112.DWG		DWG. TYPE: INTERCONNECT		DWG. NO.: PA220\010\403–0		



NOTES:

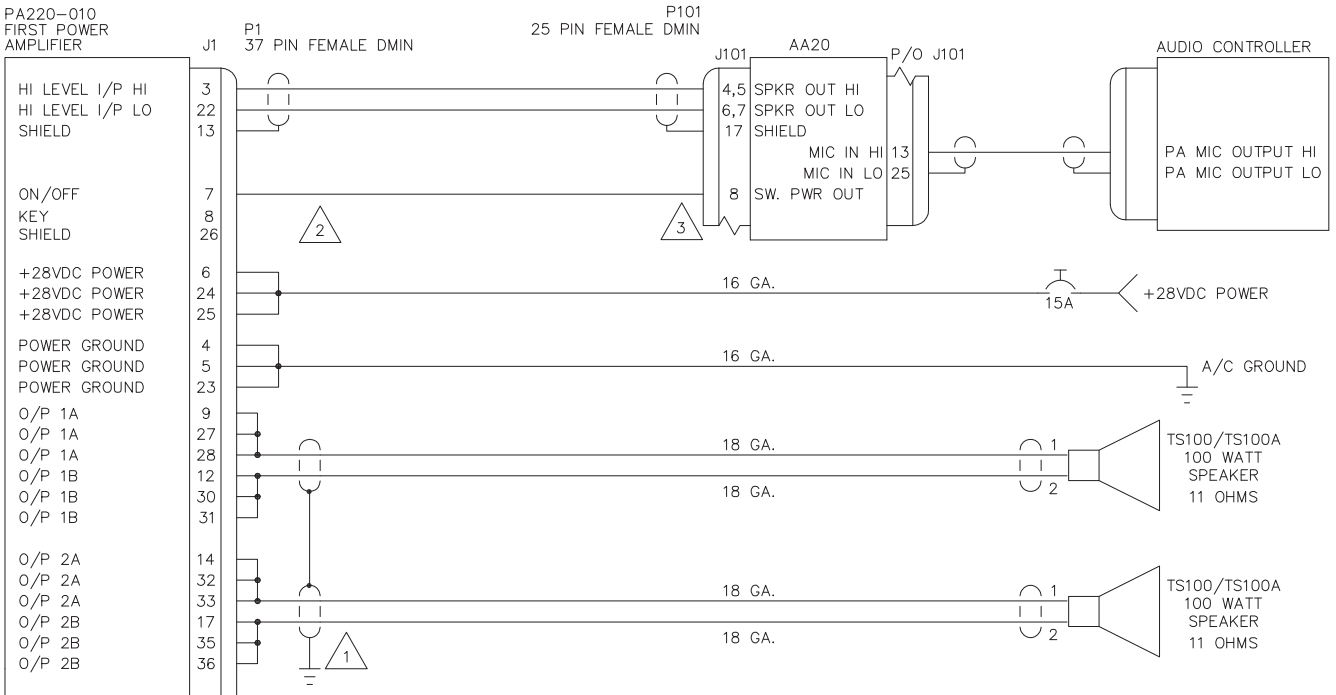
1. LOCAL AIRFRAME GROUND. MAX. LENGTH 3 FEET.
2. CONTACT FACTORY FOR INSTALLATION OPTION.
3. OLDER UNITS USE PINS 4 & 5
4. UNLESS OTHERWISE SPECIFIED USE TEFZEL MIL-M-27500, MIL-M-22759 OR MIL-M-81044 SHIELDED WIRE WITH SOLDER SLEEVES.
5. ALL WIRE 22 AWG UNLESS OTHERWISE NOTED.

DEFINITIONS:

N/C: NO CONNECTION. THE PIN IS NOT CONNECTED TO ANYTHING INTERNALLY, AND THEREFORE SHALL HAVE NO CONNECTION EXTERNALLY.

RESERVED: MAY BE CONNECTED AND USED IN THE FUTURE.
THE CIRCUITRY MAY BE PRESENT OR ADDED TO ACTIVATE THE FUNCTION.
THE PIN MAY BE USED FOR TEST PURPOSES.
THERE IS NO EXTERNAL CONNECTION.

DESIGNED	KV	nat NORTHERN AIRBORNE TECHNOLOGY LTD.					
DRAWN	TAT						
DATE	JAN 31/00	TITLE	LOUDHAILER POWER AMPLIFIER 200 WATT CONFIGURATION WITH AA22 PA/SIREN SYSTEM				
CHECKED	NAT PROD. 223 190						
APPROVED	NAT 107	SIZE A	CAGE CODE 3AB01	PART NO. PA220-010		REV. 1.00	SHEET 1/1
FILE 403-1100.DWG		DWG. TYPE INTERCONNECT		DWG. NO. PA220\010\403-1			



NOTES:

1. LOCAL AIRFRAME GROUND. MAX. LENGTH 3 FEET.
2. CONTACT FACTORY FOR INSTALLATION OPTION.
3. OLDER UNITS USE PINS 4 & 5
4. UNLESS OTHERWISE SPECIFIED USE TEFZEL MIL-M-27500, MIL-M-22759 OR MIL-M-81044 SHIELDED WIRE WITH SOLDER SLEEVES.
5. ALL WIRE 22 AWG UNLESS OTHERWISE NOTED.

DEFINITIONS:

N/C: NO CONNECTION. THE PIN IS NOT CONNECTED TO ANYTHING INTERNALLY, AND THEREFORE SHALL HAVE NO CONNECTION EXTERNALLY.

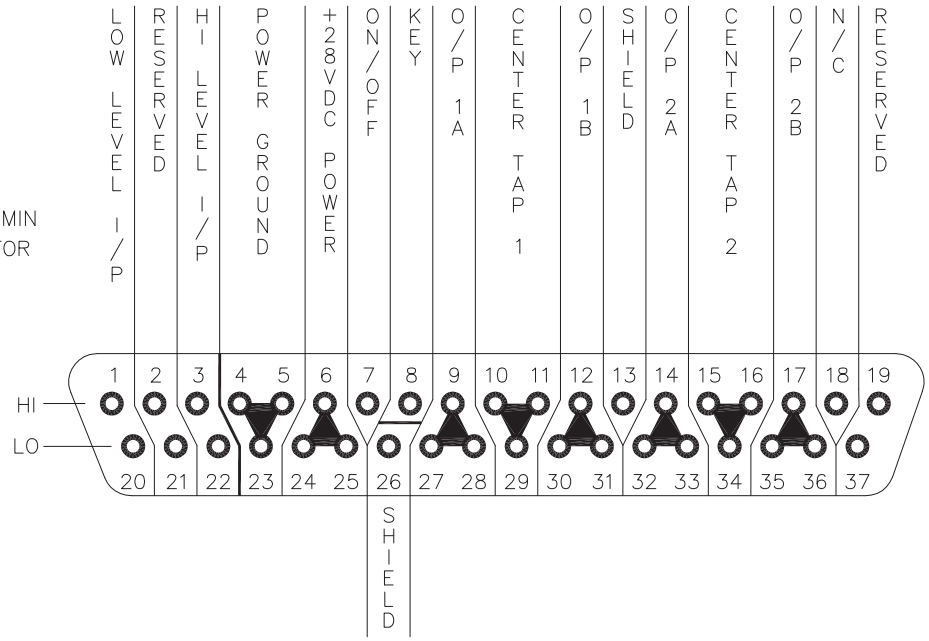
RESERVED: MAY BE CONNECTED AND USED IN THE FUTURE.
THE CIRCUITRY MAY BE PRESENT OR ADDED TO ACTIVATE THE FUNCTION.
THE PIN MAY BE USED FOR TEST PURPOSES.
THERE IS NO EXTERNAL CONNECTION.

DESIGNED	KV	nat NORTHERN AIRBORNE TECHNOLOGY LTD.				
DRAWN	TAT					
DATE	FEB 2/00	TITLE: LOUDHAILER POWER AMPLIFIER 200 WATT CONFIGURATION WITH AA20 PA/SIREN SYSTEM				
CHECKED	NAT PROD. 223 190					
APPROVED	NAT 107	SIZE A	CAGE CODE 3AB01	PART NO. PA220-010	REV. 1.00	SHEET 1/1
FILE 403-2100.DWG		DWG. TYPE INTERCONNECT		DWG. NO. PA220\010\403-2		

REVISIONS			
REV	DESCRIPTION	DATE	BY
1.01	FORMAT CHANGES.	NOV 24/94	TB
1.02	ECR #1397 – CORRECTED LABELS, FORMAT CHANGES	MAR 31/03	TAT

P1

37 PIN FEMALE DMIN
MATING CONNECTOR

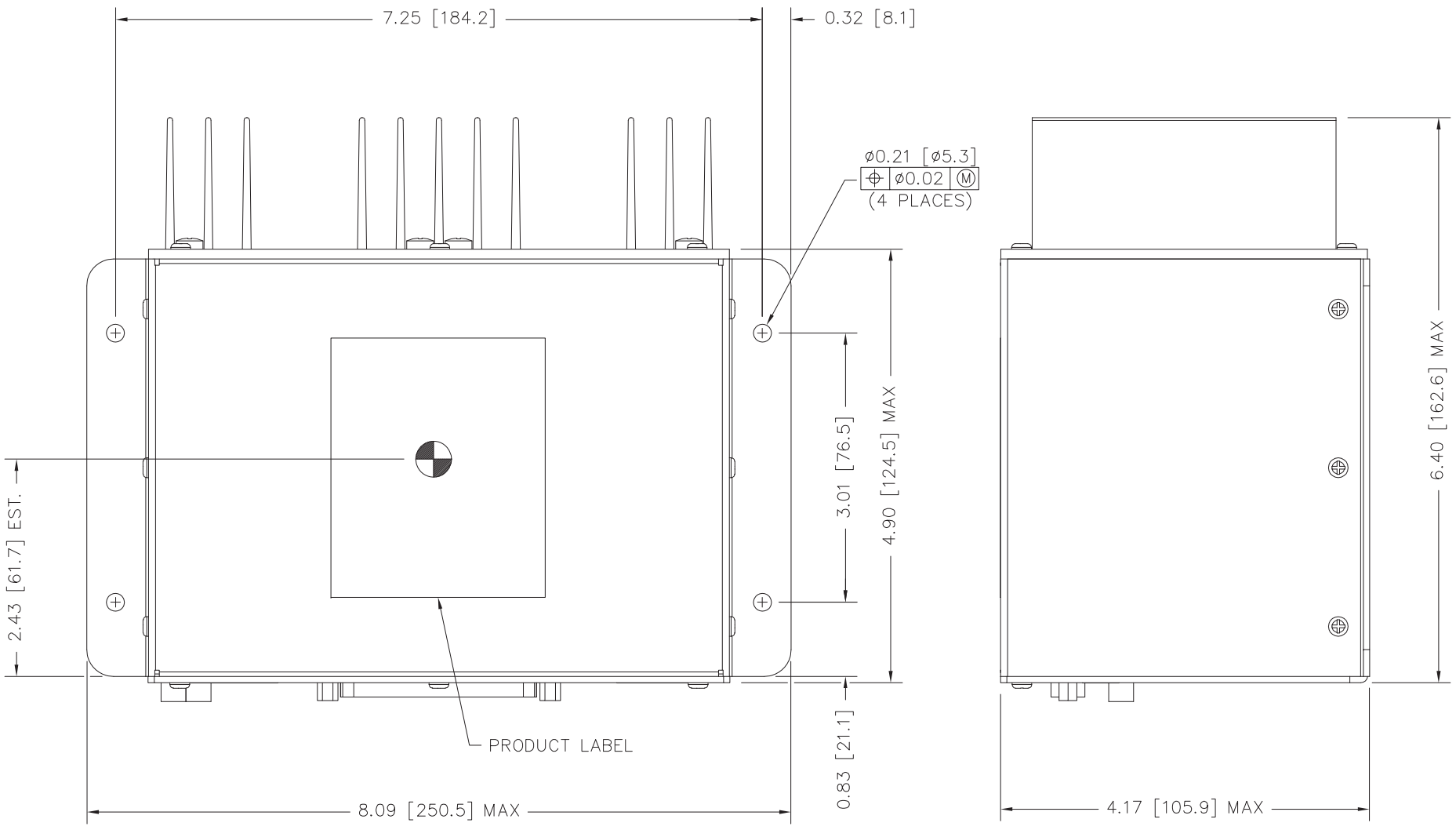


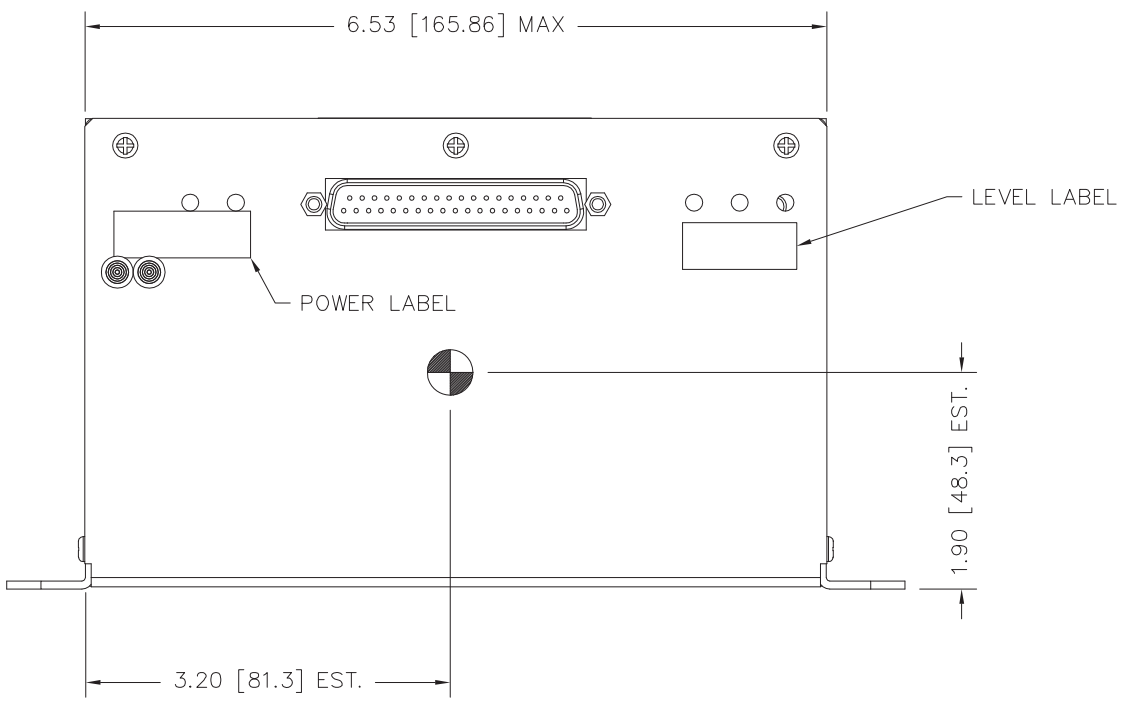
▲ DENOTES PINS CONNECTED INTERNALLY.

VIEW IS FROM REAR OF AIRFRAME CONNECTOR

DESIGNED	KV	nat NORTHERN AIRBORNE TECHNOLOGY LTD.				
DRAWN	KV					
DATE	MAY 15/98	TITLE	LOUDHAILER POWER AMPLIFIER			
CHECKED	NAT 114 / NAT 255					
APPROVED	NAT 107	SIZE A	CAGE CODE 3AB01	PART NO. PA220–010	REV. 1.02	SHEET 1/1
FILE 405–0102.DWG		DWG. TYPE CONNECTOR MAP		DWG. NO. PA220\010\405–0		

REVISIONS			
REV	DESCRIPTION	DATE	BY
1.10	CHANGED TO NEW DRAWING FORMAT	NOV 24/94	KV
1.11	HOLE LOCATIONS CHANGED	OCT 27/95	KV
1.12	ECR #1397 – ADDED DIMENSIONS, TOP LABEL AND CENTER OF GRAVITY, FORMAT CHANGES.	FEB 2/00	TAT
1.20	ECR #1708 – LABEL UPDATED, FORMAT CHANGES.	JAN 23/04	TAT
1.21	DOCCR01066 – DIM CORRECTIONS, FORMAT CHANGES.	APR 12/06	MWS
1.22	ECR#10026 – REPOSITION CONNECTOR.	MAR 31/09	MWS





CENTER OF GRAVITY

NOTES:
1. DIMENSIONING AND TOLERANCING IN ACCORDANCE WITH ASME Y14.5M–1994

TOLERANCES UNLESS STATED OTHERWISE 0.X=+/–0.030 0.XX=+/–0.010 0.XXX=+/–0.005 0.XXXX=+/–0.002 ANGLE=+/– 0.5 DEG.	DIMENSIONS IN INCHES THIRD ANGLE PROJECTION	DESIGNED KV DRAWN KV DATE JUN 1/89 CHECKED NAT 231 / NAT 255 APPROVED NAT 129	nat NORTHERN AIRBORNE TECHNOLOGY LTD. TITLE: LOUDHAILER POWER AMPLIFIER
MASS: 7.14 lbs. (3.69 Kg) MATERIAL: –			SIZE B · CAGE CODE 3AB01 · PART NO. PA220–010 · REV. 1.22 · SHEET 1/1
FINISH: POWDER COATING		FILE 922–0.DWG	DWG. TYPE MECH. INSTALLATION · DWG. NO. PA220\010\922–0

Section 3.0 Operation

3.1 Introduction

Information in this section consists of the functional and operational procedures for the PA110/220 High Power Audio Amplifiers.

3.2 General Information

The PA110/220 High Power Audio Amplifiers are designed for use in high power external loud hailer systems where high power levels are the primary requirement. Because high power (not high fidelity) is the goal, the PA110 and PA220 ARE NOT ACCEPTABLE for use as a high power cabin audio system.

The PA110/220 High Power Audio Amplifiers have no operator accessible controls. Refer to the AA21 or AA22 Operator's Manual for more detailed information.

WARNING:
High volume settings can cause hearing damage.
Prior to operation, set any volume control to the minimum setting, and slowly increase the volume to a suitable level.

Section 3.0 ends