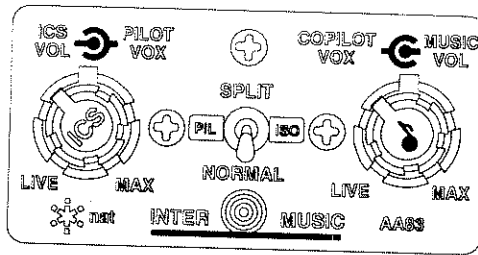




AA83 InterMUSIC™
Stereo Crew Intercom System



INSTALLATION AND OPERATION MANUAL

REV 2.00 APRIL 18/94

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Section 1.0 Description

1.1 Introduction

The AA83 InterMUSIC™ is a stereo intercom system that supports a pilot, co-pilot and two passengers. It provides entertainment and communication audio in full stereo to all four headsets, and transceiver control for both the pilot and co-pilot. The InterMUSIC™ family of stereo intercoms allows several installation configurations from single unit systems to fully independent stations for the pilot, co-pilot and passengers. Tie Line connections are compatible with other NAT systems including AA80, AA82, AMS40 and AA95 series units.

1.2 Purpose of Equipment

The AA83 InterMUSIC™ provides full boom-mic transmit and ICS functions for the pilot and co-pilot, and provides ICS and radio monitor operation for two additional passengers. Pilot priority on transmit and pilot isolation are standard features on all NAT intercom systems.

The front panel controls permit user adjustment of frequently needed signals, such as Intercom Audio Level, VOX Threshold (2), and Music Level. Internal adjustments set default values for Receive Audio Level, Receive Balance, ICS Balance, ICS Bass, Music Muting Depth and Music Balance. These extensive controls allow some unique features, such as making the intercom and radio sources appear from distinct aural positions to aid in recognition. Muting depth allows the dynamic change of the music muting function to be set to suit individual preferences, and Bass adjustments allow tailoring to the characteristics of the headsets chosen.

1.3 Design Features

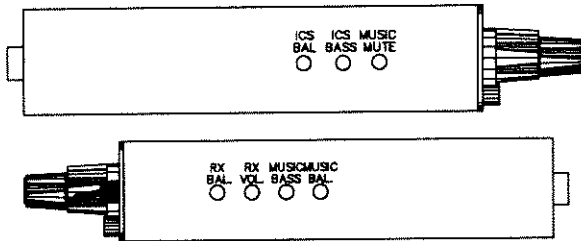
The InterMUSIC™ system employs NAT's unique audio processing which reduces noise and tailors the frequency response to produce clean, crisp intercom audio. Having high output power and low distortion results in better on-board communication and greatly reduces noise fatigue. Employing highly integrated stereo audio processors and surface mount components, product reliability and assembly is improved, and with the reduction of component size, more features were incorporated than could have been achieved with conventional assembly.

To keep a common design style between all NAT intercoms, the AA83 was designed into the same physical chassis as the AA80 InterVOX. By keeping ICS

Tie Line characteristics fully compatible with existing NAT products, it is possible to chain multiple systems together to a maximum of 3 units. The AA83 has over voltage and reverse voltage protection, to insure operability in severe aircraft environments.

The stereo music audio is muted during transmit or intercom operation, and when radio receive audio is detected, permitting greater intelligibility of incoming transmissions. The new AA83 Muting Depth adjustment ranges from complete music muting to gentle background music on command, with a fast attack and slow level return for optimum user comfort. Each microphone is individually gated for the best possible noise performance during VOX operation. This is unquestionably the best VOX system ever produced at NAT, and has been very highly rated by flight crews for unobtrusive and accurate operation. A front panel annunciator allows easy visual setting of the VOX threshold for either group, and also indicates transmit operation.

Unusual New Features



Of particular significance in the AA83 are the unique **balance** and **bass adjustments**. The bass adjustment pots permit the tone emphasis of each signal group to be set for user preferences, and to match the capability of the headsets in use. Many headsets have very poor bass response (below 300 Hz), and excessive drive in this frequency range causes objectionable break-up and distortion. Extensive testing at NAT revealed that user perception of music quality was greatly improved when the signal frequency range was reduced with lower quality, narrow bandwidth aviation headsets. The bass pots allow the frequency range to be tailored to the exact installation circumstances and equipment for the best possible audio quality.

The corresponding balance pots permit signals to be shifted in the user's **acoustic listening space** so that tower transmissions appear to come from one area, and intercom from another. This greatly aids in signal recognition and more accurately reproduces a natural listening environment for the flight crew.

1.4 Specifications

Input power:	+11 to +32 VDC. For nominal 14/28 VDC systems.
Supply Current:	0.4 ADC Max. (full output power, all users).
Headset Power:	Typical 100 mW into each side each headset (300 Ω ear element). 4 headsets total. Total maximum power 400 mW per channel .
Modes of operation:	Voice track VOX trigger circuit, with two adjustments, Pilot & Co-pilot/Passengers. Adjustable VOX threshold on front panel. "Live or Hot" mic by rotating controls fully ccw. Keyed ICS by rotating controls fully clockwise. Each mic is individually gated in all modes for minimum noise. Pilot Isolate mode, with passive radio connection. Emergency fail mode, automatic pilot connection to radios in fail-passive connection. ICS split/tie function. Permits rear AA82 or other unit to have isolated ICS function. Does not affect internal connections of AA83.
Indicators:	Transmit (Green LED). ICS (Amber LED).
Mounting:	Horizontal or vertical through panel mounting.
Controls:	
Front Panel:	ICS Volume Pilot VOX Threshold Co-pilot/Passenger VOX Theshold Music Volume Mode switch
Internal:	RX Volume RX Balance Music Bass Music Balance ICS Bass ICS Balance Music Mute

Inputs:	4 microphone "carbon equivalent". 250 mVrms for full output. 600 Ω input impedance. 2 TX keylines (active ground) for Pilot & Co-pilot. 4 ICS keylines (active ground) for all users. 2 compatible music inputs (left & right). Configurable for either Walkman™/Discman™ phones compatible (3 Vp-p), or Line Output compatible (100-500 mV @ 10 k Ω). 1 aircraft radio input. 2.5 Vrms for full output. 1 k Ω input impedance. 1 bi-directional ICS Tie Line. 1 Vp-p for full output. 2.2 k Ω input impedance.
Outputs:	4 aircraft stereo headsets (300 Ω /side). Not designed for 8 Ω headsets. 1 radio microphone output to aircraft audio panel. 1 TX keyline output (hard ground for TX).
Logic:	TX, active ICS, and incoming Receive Audio all mute the music channel (Muting depth adjustable). Fast attack, slow return of music signal. Pilot TX priority.
Weight:	283.5 g. (10.0 oz.) excluding external hardware.
Dimensions:	3.30 cm H x 6.60 cm W x 14.22 cm L (1.30" H x 2.60" W x 5.60" L) excluding front panel controls.
Environmental:	Operating Temp.: -40° C. to +70° C. Storage Temp.: -55° C. to + 85° C. (survival) Altitude: 25,000 feet. Humidity: 95% Non-condensing Vibration: DO-160C category "P", panel mounting 6 G.

End of Section 1.0

Section 2.0 Installation

2.1 General

Installation information in this section consists of unpacking and inspection procedures, installation procedures, post-installation checks and installation drawings. Check all notes and cautions before installation.

2.2 Unpacking and Inspection

Unpack the equipment carefully and locate the warranty card. Inspect the unit visually for damage due to shipping and report all such claims immediately to the carrier involved. Note that each complete unit should have the following:

- Warranty Card
- Installation Manual (this document)
- Inspection Release.
- **Installation kit, including:**
 - 44 solder type pins with connector, hood and jackscrew locks
 - 1 rectangular, reversible faceplate
 - 4 knobs, 2 large, 2 small-ICS/music
 - 3 black mounting screws (6-32)
 - 1/2 A fast fuse
 - Drill Template Guide

Verify that all items are present before proceeding and **report any shortage immediately to your supplier.**

Complete the warranty card information and send it to NAT when the installation is complete. If you fail to complete the warranty card, the warranty will be subsequently activated on the **date of shipment from NAT.**

2.3 Installation Procedures

2.3.1 Warnings ← **IMPORTANT!**

Do not bundle **any lines from this unit** with transmitter coax lines. Do not bundle any logic, audio, or DC power lines from this unit with 400 Hz synchro wiring or AC power lines. Do not position this unit next to any device with a strong alternating magnetic field such as an inverter, motor or blower, or significant audio interference will result.

2.3.2 Cautions

In all installations, use shielded cable exactly as shown and **ground as indicated**. Significant problems may result from not following these guidelines.

All audio installations can be seriously degraded by incorrect wiring and shielding, and may result in abnormal cross-talk, hum and ground-loop noise. Be especially careful with all microphone wiring and Tie Line wiring, as these lines carry the lowest level signals in the aircraft.

All microphone and headset jacks should be electrically isolated from the airframe or significant ground loop noise may result.

2.3.3 Installation Notes

All AA95/AMS4X Audio Controllers used with the AA83 must have the ICS Tie Line and Gain Modifications installed. This will only be a concern on Audio Controllers with S/N 1918 or before. If the AA83 is used with a second unit such as an AA82, you may wish to install the 2.2 k Ω resistor shown in the installation drawing. This is used to equalize ICS Tie Line loading when changing from the tie to split connections. If you are not familiar with Tie Line techniques, request the installation bulletin from NAT covering Tie Line theory and practice.

2.3.4 Cable and Wiring

Use Tefzel M27500 or Raychem spec. 44 (81044) shielded wire with Raychem solder sleeves (for shield terminations) to make the most compact and easy to terminate interconnect. Follow the wiring diagram provided in Section 2.4.

Allow 3" from the end of the wire to the shield termination to allow the connector hood to be easily installed. Note that the hood is a "clamshell" hood, and is installed after the wiring is complete. Aircraft harnessing should permit the unit to be lowered from the panel for easy access to all side adjustments. Do NOT mount the unit until all adjustments have been carried out.

All wiring should be at least 24 AWG, except power and ground lines which should be at least 22 AWG. Ensure 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 breaker (1/2 A) or fuse (1/2 A fast), and not attached to any other existing breaker without additional protection. The correct fuse is included with the AA83.

2.3.5 Mechanical Mounting

The AA83 InterMUSIC™ can be mounted in a vertical or horizontal attitude directly on the instrument console. A clock mount faceplate is not available, due to interference with the knobs when mounted in a clock hole. An optional instrument hole adapter plate is available (NAT P/N 50-04-83S).

Place the drill template in an appropriate place on the instrument panel, and drill through the indicated locations. **Please note the mounting nuts on the panel pots should not be removed at any time.** Their clearance holes should be 3/8", to allow them to fit into the instrument panel. The unit is secured by three black pan head screws, which require 5/32" holes.

Be sure the knobs are correctly positioned and aligned on the AA83 before tightening the setscrews. The ICS knob goes on the LEFT, and the music knob on the RIGHT. Make sure there is enough clearance between the concentric knobs so that rotating one does not also move the other. A piece of paper makes a good spacer when setting up the clearance.

Before the unit is mounted, make all functional tests and trimpot adjustments. Be sure the harness has enough clearance to permit the unit to be dropped down for re-adjustment, if needed later. Make sure unit is securely fastened to the panel, and that the connector locks are tightened **before any flight is attempted**.

2.3.6 Post-Installation Checks

With the AA83 disconnected from its mating connector, check pin <1> for +12 to +28 VDC relative to ground, and check pin <16> for continuity to ground (below 0.5 Ω). Check all mic, phone, music, and key lines for shorts to ground or adjacent pins. Check all key lines for correct operation. **Do not attach the AA83 until these conditions are met.**

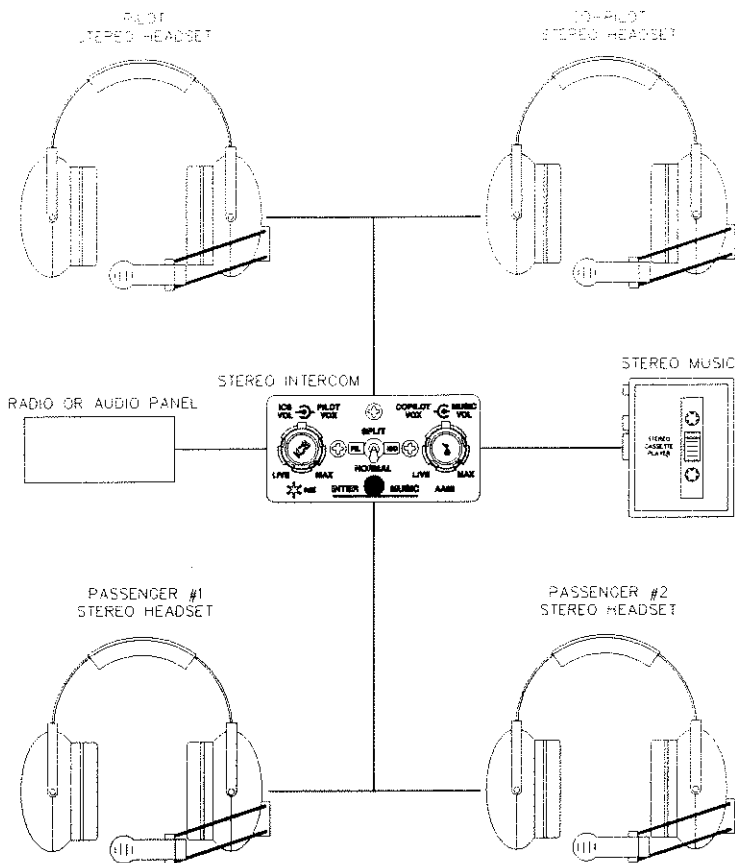
Power up the aircraft's system with the unit installed and turn on the radios and accessories required for the system. Refer to Section 3.0 for operation and set-up information. Check for correct ICS, radio, and entertainment operation. Unusual buzzes, hums or other background audio are symptomatic of multiple grounds or noisy external systems sharing the same wire bundle. Note that incorrect jack wiring is a common fault, especially for passenger stations, and may cause loss of audio, a tone on the headset lines, or other problems.

Be sure headsets are of good quality and are installed correctly. **NEVER USE MONO AIRCRAFT HEADSETS** in this system, as they will short out one side of the AA83 power amplifier when installed in stereo jacks. This may result in eventual unit failure, which IS NOT COVERED BY WARRANTY.

2.4 Installation Drawings

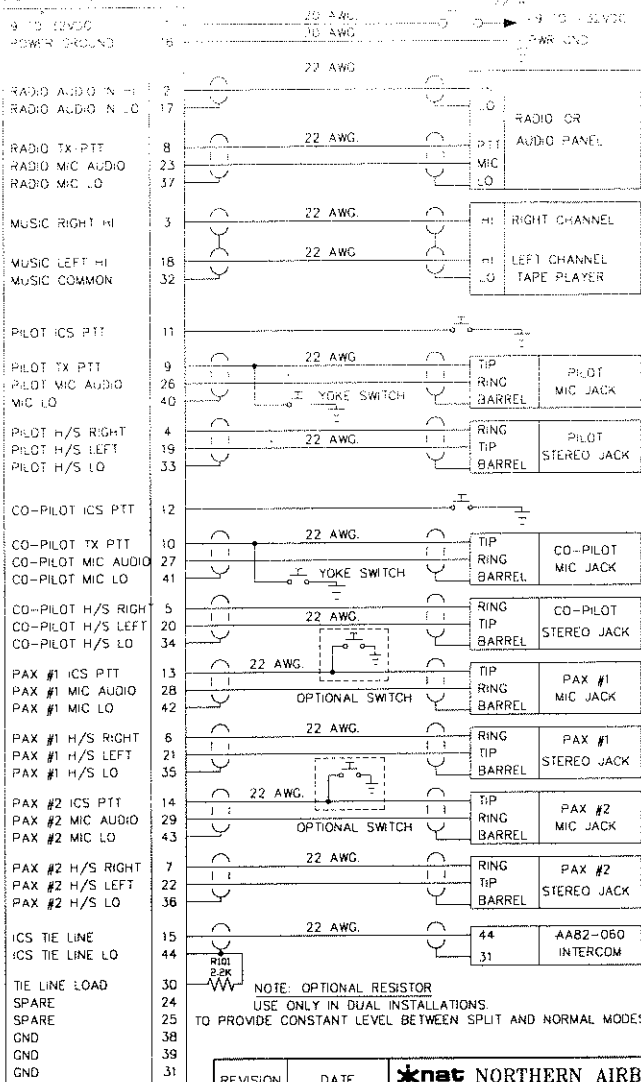
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AA83-001\302-0	1.00	InterMUSIC System	Block Diagram
AA83-001\403-0	1.11	Installation Diagram	Interconnect
405-83-001	-	InterMUSIC Interconnect	Connector Map
AA83-001\921-0	1.00	AA83-001 Drill Template	Mechanical

Section 2.0 ends after these Drawings



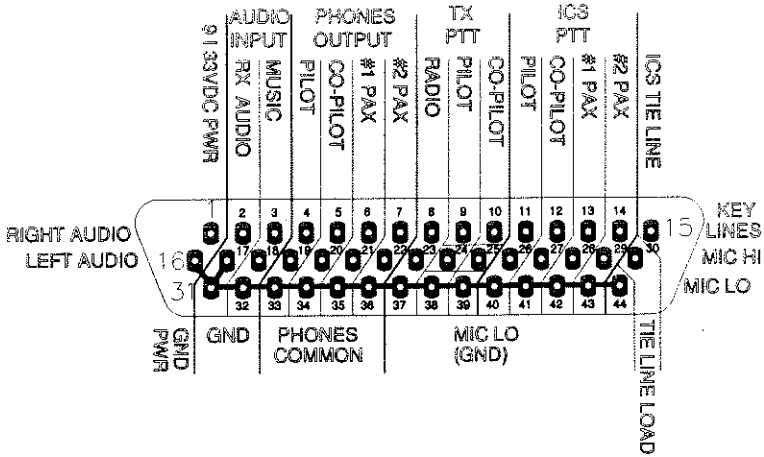
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1.00		MAY 6/94		DESIGNED BY	DESCRIPTION		
				K. V.	INTERMUSIC SYSTEM		
				DRAWN BY	PART NUMBER	DRAWING TYPE	SHEET
				T. MASTERS	AA83-001	BLOCK DIAGRAM	1/1
				APPROVED BY	DRAWING NUMBER	FILE NUMBER	
				NAT R&D	AA83-001\302-0	AA83-001\302-0100	

AAB3-001 EXTERNAL CONNECTIONS
 (REV. 11-84)



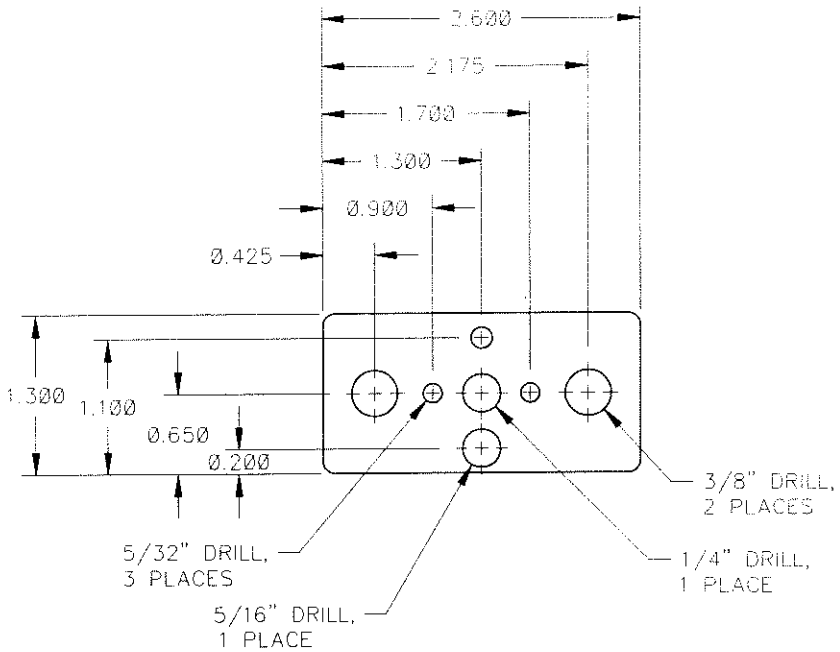
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1.10	MAY 20/94	K. VEITCH	INTERMUSIC STEREO INTERCOM		
1.11	AUG 16/94	DRAWN BY	PART NUMBER	DRAWING TYPE	SHEET
		K V./T.M.	AAB3-001	INTERCONNECT	1/1
		APPROVED BY	DRAWING NUMBER	FILE NUMBER	
		NAT R&D	AAB3-001\403-0	AAB3-001\403-0111	

AA83-001
 INTERMUSIC
 INTERCONNECT



REVISION	DATE	NORTHERN AIRBORNE TECHNOLOGY LTD. 1925 KIRSCHNER RD. KELOWNA, B.C.		
		DESCRIPTION	PART NUMBER	DRAWING NUMBER
		CONNECTOR MAP	AA83-001	405-83-001
		DATE	DRAWN BY	APPROVED BY
		MAY 27/91	K VEITCH	NAT PROD

AA83-001 DRILL TEMPLATE



NOTE: ALL TOLERANCES ± 0.01

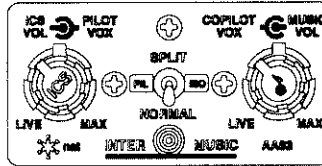
REVISION	DATE	TOLERANCES UNLESS STATED OTHERWISE	*nat NORTHERN AIRBORNE TECHNOLOGY LTD.			
1.00	MAY 18/94	0.X=+/-0.030 DIM. IN INCHES 0.XX=+/-0.010 0.XXX=+/-0.005 0.XXXX=+/-0.0005 ANGLE=+/- 0.5 DEG.	DESIGNED BY	DESCRIPTION		
			K. V.	DRILL TEMPLATE		
			DRAWN BY	PART NUMBER	DRAWING TYPE	SHEET
			T. MASTERS	AA83-001	MOUNTING PLATE	1/1
THIRD ANGLE PROJECTION		MATERIAL/FINISH	APPROVED BY	DRAWING NUMBER	FILE NUMBER	
			NAT R&D	AA83-001\921-0	AA83-001\921-0100	

Section 3.0 Operation

3.1 General

The AA83 InterMUSIC™ is a stereo intercom system that supports a pilot, co-pilot and two passengers. It provides entertainment and communication audio in full stereo to all four headsets, and transceiver control for both the pilot and co-pilot. The InterMUSIC™ family of stereo intercoms allows several installation configurations from single unit systems, to fully independent stations for the pilot, co-pilot and passengers. Tie Line connections are compatible with other NAT systems including AA82, AMS40 and AA95 series units for expanded systems.

Front View of AA83



ICS Vol/Pilot VOX

Mode Switch
& Annunciator

Music Vol/Co-Pilot VOX

3.1.1 Stereo & Intercom Special Features

The stereo music audio is muted during transmit or intercom operation and when radio receive audio is detected, permitting greater intelligibility of incoming transmissions. The AA83 Muting Depth adjustment ranges from complete music muting to gentle background music on command, with a fast attack and slow level return for optimum user comfort. Each microphone is individually gated, for the best possible noise performance during VOX operation. This is unquestionably the best VOX (voice-activated) intercom system ever produced at NAT, and has been very highly rated by flight crews for unobtrusive and accurate operation. A front panel annunciator allows easy visual setting of the VOX threshold for either group, and also indicates transmit operation.

3.1.2 Communication Functions

The AA83 InterMUSIC™ provides full boom-mic transmit and ICS functions for the pilot and co-pilot, and provides ICS and radio monitor operation for two additional passengers. Pilot priority on transmit and pilot isolation (direct connection to the aircraft radio system) are standard features on all NAT intercom systems. The AA83 can support PTT ICS operation for all users, and can be wired to cyclic/yoke switches for both TX and ICS functions. The VOX must be set to maximum (squelched completely off) for correct PTT ICS operation.

3.1.3 Control Overview

The front panel controls permit user adjustment of frequently needed signals, such as Intercom Audio Level, Microphone VOX Threshold (2), and Music Level. The Co-pilot VOX setting also controls the passengers VOX threshold.

Internal adjustments set default values for Receive Audio Level, Receive Balance, ICS Balance, ICS Bass, Music Muting Depth and Music Balance. These extensive controls allow some unique features, such as making the intercom and radio sources appear from distinct listening space positions to aid in recognition.

Music Muting depth allows the dynamic range of the music muting function to be set to suit individual preferences, and Bass adjustments allow tailoring to the exact characteristics of the headsets chosen. Music muting occurs in a smooth, fast attack/slow return sequence, for maximum comfort and clarity of communication in all modes.

3.1.4 Important Operating Considerations

Ensure headsets are of good quality and are installed correctly. **NEVER USE MONO AIRCRAFT HEADSETS** in this system, as they will short out one side of the AA83 power amplifier when installed in stereo jacks. This may result in eventual unit failure, which IS NOT COVERED BY WARRANTY. Use **only stereo headsets** with this system, and be sure the aircraft is placarded appropriately.

3.2 AA83 Set-up

Most of these internal adjustments will have been set up by your avionics installer, but so you will understand **how** they work, the following procedure explains all the adjustments in the AA83. This unit has very sophisticated audio processing and settings have other implications for safe operation. Ensure you understand each adjustment before making any changes. If you have any questions **see your avionics shop for assistance**.

3.2.1 Radio Settings

To achieve correct **radio volume settings**, make sure that the radio level in the pilot's headset is acceptable in the **PILOT ISO** mode (this is a direct connection to the radio, bypassing the internal amplifier in the AA83). This adjustment should have the radio volume itself set to about 50%. Adjust your headset volume control (if it exists) for something **LESS** than full, such as 75% (full output on active headsets will give the **WORST** over-all signal to noise ratio, as it will pump up the low level noise floor under all conditions).

Once that resulting volume is satisfactory, you can return the AA83 to **NORMAL** operation with the mode switch, and adjust the **RX VOL(ume)** trimpot for suitable radio volume during regular operation. Be sure that the music is muting at this stage when a radio signal is received. If not, you have the **radio itself set too low**, and it must be increased at the radio to properly activate the internal muting circuit in the AA83. Once the radio settings are OK, go ahead and make all other adjustments. The **RX VOL(ume)** trimpot sets only the radio level heard during normal operation, and has no effect on any other function, including muting.

3.2.2 Setting Up Muting and Music

Rotate the front panel **VOX** pots until the **VOX** indicator is off. The music audio can now be heard. Adjust the music to a comfortable level with the front panel pot. If the music is louder in one ear than the other, the side panel **MUSIC BAL(ance)** control needs adjusting, although this may be a problem with your music source, as this adjustment should be correct from the factory.

With the front panel **VOX** pots turned fully counter-clockwise (**LIVE ICS**, the indicator should be **ON**), adjust the **MUSIC MUTE** trimpot to the desired level of music audio in the background. This is the level the music will go to whenever it is muted, and can range from **OFF** to only slightly muted, as you prefer. Be sure that the selected muting level **DOES NOT INTERFERE with ATC transmissions to the aircraft**. Reduce the music level if any significant interference with ATC is found. Remember that flight safety is **far more**

important than music, and you must ensure that incoming ATC communication is clear under all conditions.

3.2.3 Setting Balance and Bass Pots

With the **VOX** controls still in the LIVE ICS position, talk back and forth on the intercom, and determine what the voice quality is like. If you wish more bass, you may adjust the **ICS BASS** pot for the correct tone. Be sure this adjustment is compatible with your headsets, and that it does not increase distortion. If the ICS audio seems distorted, reduce the **ICS BASS** pot for best results. Some aircraft headsets do not have very good internal microphone amplifiers, and achieve "noise reduction" by shunting the microphone with a large capacitor to reduce high frequency noise. This may make the voice very bass heavy and muffled. Best results were obtained in NAT testing with the following headsets:

Bose (may require re-wiring of plug for stereo)

David Clark (may require modification for stereo)

Most aircraft headsets do not do a good job of reproducing wide bandwidth music information which will seriously compromise the performance of the AA83. NAT will test any headset you wish for system compatibility, if you supply a unit for evaluation with the AA83.

If you wish the ICS audio to come from a particular location (left to right), adjust the **ICS BAL(ance)** pot for the desired position. Note that if you have not controlled the Left/Right headset jack wiring, it may appear to change locations between different users. Set the location to suit your preference. Listen to an incoming radio transmission and position it (ideally) in the opposite location with the **RX BAL(ance)** trimpot. The best setup should give some perceived difference in location for these two sources (radio & ICS), as it will greatly improve recognition of who is speaking in the system.

3.2.4 Other ICS Functions

Run through all installed functions, and check the ICS and TX functions for all users. The **VOX** pots on the front control the Pilot and the Co-Pilot & passengers. Adjust them as needed for the best performance. Note that significantly different headsets may have different microphone characteristics, which will affect **VOX** squelch settings. Note that the David Clark M-7 mic is *much more active* than M-4 or M-1 mics, and may aggravate headset imbalance if used in a mixed system.

To test **KEYED** ICS operation (if installed), be sure the **VOX** pots are set fully clockwise and all ICS audio is shut off. Keying the ICS switches should now

activate the specific mic involved. Note that *each mic is individually gated* in the AA83, and only the mic involved with a key signal is activated.

The front panel indicator should light orange when there is activity on the intercom. When transmitting from the Pilot or Copilot position (**NORMAL** operation), the intercom should be muted.

3.2.5 Final Check

Fly the aircraft and check levels and operation of all functions. You may wish to change Bass or Balance controls after flight, depending on how the system performs with regard to ambient noise.

Before leaving the aircraft, insure that **THE MATING CONNECTOR IS SECURELY FASTENED TO THE AA83, AND THE UNIT IS SECURELY FASTENED TO THE AIRCRAFT PANEL.**

If any preset requires adjustment, be sure this is carried out before the aircraft leaves, and that the unit and its mating connector are secured before departure.

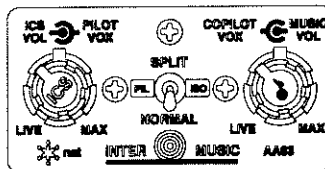
3.3 Normal Operation

In normal use, the AA83 serves as a common intercommunication system for up to four users, and a flow-through interface for connection to the ship's external communication system. The front panel controls allow both the Pilot and Co-pilot (plus the passengers) to set their respective VOX trigger points independently to match different headsets or noise locations.

The **VOX** controls are the outer or rear knobs on the front of the AA83, with the Pilot on the LEFT, and the Co-pilot on the RIGHT.

VOX Control

VOX Control



If either **VOX** control is rotated fully counter-clockwise, the intercom will go **LIVE**, or into a "hot mic" condition for the user that selected that function. The front panel indicator will light orange when the **VOX** is activated. If the controls are rotated fully clockwise, the **VOX** will be in its fully **OFF** position (**MAX**), and can be run via external **ICS PTT** switches on the yoke or cyclic. Intercom volume is set via the **ICS** control on the left side of the AA83.

In normal operation, the **MODE** switch is set to the **NORMAL** position. A transmit command from either the Pilot or Co-pilot will send their microphone signal through to the aircraft communication system. Correct operation will be indicated by the front panel indicator lighting green.

3.3.1 Logic Explanation

When transmitting, any music will be muted quickly, and will slowly return when transmission is completed. Music will also be muted when **ICS** or **RX** functions are active. The degree of muting is set via the **MUSIC MUTE** adjustment explained in Section 3.2.2. The relative volume of the music can be changed from the front panel by the knob marked with a musical note.

Below is a simple chart to aid in understanding audio switching in the **NORMAL** Operation mode. The following terms are used:

"Active" - Function being used.

"Muted" - Functions that are overridden by the active condition.

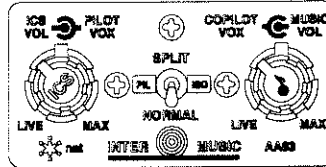
Music	ICS	RX	Pilot TX	Copilot TX
Active				
Muted	Active			
Muted		Active		
Muted	Muted		Active	Muted
Muted	Muted			Active

3.4 Pilot Isolation Operation

In normal operation, the Pilot, Co-pilot, and passengers hear the same signals from the aircraft communication system. Sometimes this is not desirable from the pilot's perspective, such as when he needs to communicate with the tower on approach or has a heavy traffic load, and is not interested in the discussions on the intercom. Many times the Co-pilot is simply another passenger, and the pilot may wish to be isolated from them.

The **MODE** switch has a middle position, marked **PILOT ISO**, which disconnects the pilot from the internal amplifier of the AA83 and connects the pilot directly to the aircraft communication system. All other users are unaffected and continue to use the entertainment and intercom functions of the AA83.

MODE Switch



The pilot has no ICS operation when selected to **PIL ISO**, and all his signals are presented in mono format during this mode.

This mode is "fail-passive", meaning that it requires no power to operate and is the same mode the box goes into *automatically when power is lost to the AA83*. In this way, switch over is immediate for the pilot and there is no possibility of lost communication because of a lack of pilot action. Note that the pilot's boom mic is sent directly to the radio in this mode, and only a PTT key input is needed to transmit.

3.5 Tie/Split Operation

The **MODE** switch has one further position, which can be used in expanded systems for more complex audio circuits. If an outboard AA82 has been installed (or some other NAT system with tie line capability), then this switch will open and close the tie line output to create common or split intercom circuits with the external system.

In all positions other than **SPLIT**, the ICS tie line is sent to outside systems for common intercom operation. This can be used for common communication from front to rear (for example) in a larger aircraft. When set to the **SPLIT** position, the AA83 cuts the tie line, breaking the two units into individual intercom circuits with isolated conversations. In this way, many different circuit combinations can be set up, depending on what device is hooked to the tie line.

With no external unit, the **SPLIT** position has no function within the AA83.

3.6 -002 Information

3.6.1 General

The AA83-001 was originally designed to accept music inputs from a Walkman™/Discman™ type head phone output. Through the use of coupling transformers, it is also possible to utilize the speaker outputs from automotive type stereo units. Numerous requests were received at NAT to make the music inputs compatible with the pre-amp output from better quality stereo devices, eliminating the need for the matching transformers. This request was evaluated and implemented as the AA83-002 version of the InterMUSIC™, defining the internal changes to the music input circuits. This concept is applicable to AA83 units S/N 1001 to 1090 inclusive, which use the Rev. A PCB.

With the introduction of the Rev. B PCB, beginning at S/N 1091, all AA83 units can now be configured in the field for either a -001 or -002 type music circuit. This is determined by the configuration of two internal jumpers (J103 and J104) which can be accessed by removing the cover from the AA83 and top PCB. **The AA83 is normally shipped from the factory as a -001 version.**

3.6.2 Implementation Instructions

Note: The AA83 is a static sensitive device. Use proper ESD handling procedures when the cover is removed.

The two types of music inputs are configured by the position of jumpers J103 and J104, located on the main PCB near the access hole for Q101. Music input type is determined as follows:

-001 Type (Low Z/Walkman™ compatible)	J103 Installed ➤
	J104 Installed ➤
-002 Type (High Z/Pre-Amp compatible)	J103 Removed ➤
	J104 Removed ➤

To gain access to the jumpers, remove the cover from the AA83. Remove the top PCB by removing the three pan head screws and carefully lifting it straight up. When reassembling the unit ensure the pins and connector are aligned properly before screwing the PCB down.

End of Section 3.0