Maintenance Manual

RTA-83B
VHF Communications
System

NOTE

IF ANY UNUSUAL OR SPECIAL SERVICE PROBLEMS ARISE, CONTACT ALLIEDSIGNAL COMMERCIAL AVIONICS SYSTEMS CUSTOMER SUPPORT DEPARTMENT.

PROPRIETARY NOTICE

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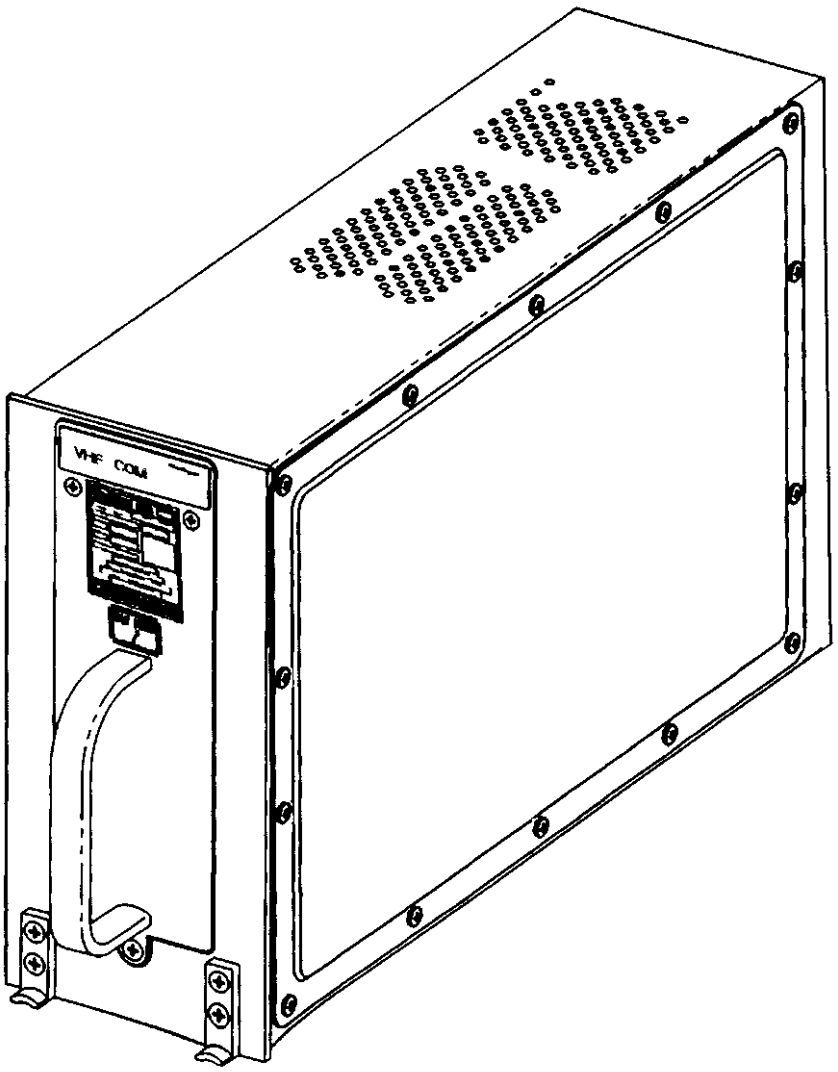
INTRODUCTION

This manual, I.B. 1183-2 (23-20-04), contains information covering description and operation, installation, and checkout procedures for the AlliedSignal Commercial Avionics Systems RTA-83B VHF Communications System.



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RTA-83B VHF Communications Transceiver
Figure 1

DESCRIPTION AND OPERATION

1. General

This section contains descriptive information covering the RTA-83B VHF Communications System and lists other components required for system operation. The RTA-83B VHF Communications Transceiver is illustrated in figure 1.

A. Purpose of Equipment

The RTA-83B VHF Communications System consists of an airborne VHF communications transceiver designed to provide clear voice and data communications between on-board aircraft systems, to other aircraft systems, and to ground based systems. The system provides dependable operation in the European assigned 8.33-kHz spaced channels of the 118.000 to 136.992 MHz band and also in the 25-kHz spaced channels of the 118.000 to 136.975 MHz frequency band. The RTA-83B has two basic types of operation: standard double sideband am analog voice communications and MSK (minimum shift keying) data capability.

The RTA-83B VHF Communications Transceiver (shown in figure 1) conforms to industry standards: Aeronautical Radio Incorporated (ARINC) 716-8 *Airborne VHF Communications Transceiver*, ARINC 429-14 *Mark 33 Digital Information Transfer System*, Radio Technical Commission for Aeronautics (RTCA) documents number DO-186a *Minimum Operational Performance Standards (MOPS) for Airborne Radio Communications Equipment Operating within the Radio Frequency Range 117.975 - 137.000 Megahertz* and number DO-207 *MOPS for Devices that Prevent Blocked Channels Used in Two-Way Radio Communications Due to Unintentional Transmissions*, and European *Organisation* for Civil Aviation Equipment (EUROCAE) ED-23B *Minimum Performance Specification for Airborne VHF Communications Equipment Operating in the Frequency Range 117,975 - 137,000 MHz* and ED-67 *Minimum Operating Performance Specification for Devices that Prevent Unintentional or Continuous Transmissions.*

The RTA-83B is fully interchangeable with the earlier ARINC 716 RTA-44A VHF Communications Transceivers for backward compatibility.

The RTA-83B VHF Communications System requires an antenna for its rf inputs and outputs, a control head or radio management panel, an audio input source and output sink for its analog voice functions, and an Aircraft Communications Addressing and Reporting System (ACARS) Management Unit (MU) or a Communications Management Unit (CMU) for its digital control and data functions. The system may also be connected to a Central Fault Display System (CFDS).

Depending upon the selected mode, the RTA-83B operates with the following equipment:

- an ARINC 618 ACARS MU or ARINC 758 CMU,
- an ARINC 604 and Airbus Industrie ABD-0018 Centralized Fault Display Interface Unit (CFDIU), or ARINC 624 Onboard Maintenance System (OMS),
- an ARINC 716-8 voice audio input source and output sink,
- an ARINC 716-8 voice frequency control source,
- an antenna.

B. Equipment Part Numbers

Components of the RTA-83B VHF Communications System supplied by AlliedSignal Commercial Avionics Systems (CAS) are listed in figure 2. The figure lists the currently available components of the system, along with part numbers and equipment type numbers.

EQUIPMENT TYPE NUMBER	EQUIPMENT DESCRIPTION	PART NUMBER
RTA-83B VHF Communications Transceiver	Airborne VHF communications transceiver capable of receiving and transmitting VHF communications signals over a frequency range of 118.000 to 136.992 MHz with 8.33-kHz channel spacing or a frequency range of 118.000 to 136.975 with 25-kHz channel spacing. Complies to RTCA DO-207 "stuck mic" detection which selectively emits a 1-kHz interrupted warning sidetone during last five seconds of 35-second transmission. Meets DO-160C HIRF and lightning protection requirements and 200-ms power interrupt transparency requirements. Meets ICAO Annex 10 FM interference immunity. Capable of interfacing CFDS Airbus Industrie ABD-0018.	064-50002-0101

RTA-83B VHF Communications System Components (CAS Supplied)
Figure 2

C. Equipment Required but Not Supplied

Figure 3 lists equipment required for the RTA-83B system, but not supplied by AlliedSignal Commercial Avionics Systems.

EQUIPMENT	DESCRIPTION
Power Source	DC power supply of 27.5 volts, 1.0 ampere nominal during reception and 8.0 amperes maximum during transmission.
Audio Distribution System	Audio system with an input impedance of 200 to 10,000 ohms.
ARINC Characteristic 716-8 Control Panel	Provides remote control of frequency selection for 8.33-kHz or 25-kHz channel spacing system operation (serial digital, ARINC 429-14) power, on/off, volume, and squelch control.
MU/CMU	Provides control and data source/sink when operating in the data mode.
3 MCU Unit Mount	Provides a means of mounting RTA-83B VHF Communications Transceiver in the aircraft.
VHF Antenna	Capable of receiving and transmitting VHF signals over a frequency range of 118.000 MHz through 136.992 MHz.
Cables and Connectors	Necessary connectors and cables as shown in RTA-83B VHF Communications System Interwiring Diagram, figure 204.

Equipment Required but Not Supplied
Figure 3

D. Related Publications

Figure 4 lists the publications covering the RTA-83B VHF Communications System.

PUBLICATION	CAS IDENTIFICATION NUMBER	ATA IDENTIFICATION NUMBER
RTA-83B VHF Communications Transceiver Component Maintenance Manual	I.B. 1183G	23-20-40

Related Publications
Figure 4

2. Configurations Available

Figure 5 lists the available configurations of the RTA-83B and the features contained in each configuration. Figure 6 contains a brief description of each feature.

CAS PART NUMBER 064-50002	FEATURES				
	BASIC UNIT	FAULT MEMORY	STUCK MIKE ALARM	COMPATIBILITY	
				ACARS	CFDS
-0101	X	X	X	X	X

RTA-83B VHF Communications Transceiver, Configurations Available
Figure 5

FEATURE	DESCRIPTION
Basic Unit	Airborne solid-state RTA-83B is capable of receiving and transmitting ARINC 716-8 voice over a frequency range of 118.000 to 136.992 MHz with 8.33-kHz channel spacing. The unit is also capable of receiving and transmitting ARINC 716-8 voice and data over a frequency range of 118.000 to 136.975 MHz with 25-kHz channel spacing. The basic unit has fault memory, stuck mike alarm, and is compatible with ACARS and CFDS features.
Fault Memory	A nonvolatile, single-chip fault memory that allows the recording of faults associated with a particular flight leg. Sixty-four flight legs are available with each flight leg made up of a flight-leg information header containing a fault record section for recording ten airborne faults and three ground faults. When all flight legs have been used, the oldest flight leg shall be reused.
Stuck Microphone Alarm	After the RTA-83B detects that the microphone is in the transmit (keyed) position for a time duration longer than 30 seconds, a rear connector selective 1-kHz interrupted tone (½ second on, ½ second off) is emitted for five seconds via the audio/sidetone output. After a total of 35 seconds, the RTA-83B turns off the transmitter and the 1-kHz interrupted sidetone. To reactivate the transmitter, the microphone push-to-talk button must be released and then rekeyed. This feature can be disabled via program pins on the rear connector.
ACARS Compatible	The RTA-83B ensures proper processing of the Aircraft Communications Addressing and Reporting System (ACARS) messages.
CFDS Compatible	The RTA-83B interfaces fault memory and BITE data between the RTA-83B and line maintenance Centralized Maintenance Computer (CMC) for the purpose of extracting maintenance information and initiating tests. Designed to conform with Airbus Industrie ABD-0018.

RTA-83B VHF Communications Transceiver Features
Figure 6

. System Leading Particulars

A. Unit Specifications

Figure 7 lists the leading particulars for the RTA-83B VHF Communications System.

CHARACTERISTICS	DESCRIPTION
General	
Power Requirements	27.5 Vdc nominal (+10%, -20%) 1.0 ampere - Receive 5.5 ampere - Transmit
Weight	4,0 kg (8.8 lbs)
Dimensions	Refer to outline drawing, figure 203
Form Factor	3 MCU per ARINC Characteristic 600
Cooling	Forced air per ARINC Characteristic 600
Temperature Operating Storage	 -55°C to +70°C (-67°F to +158°F) -65°C to +85°C (-85°F to +185°F)
Frequency Range and Channel Spacing	118.000 MHz to 136.992 MHz with 8.33 kHz channel spacing or 118.000 MHz to 136.975 MHz with 25 kHz channel spacing
Frequency Selection	Serial Digital per ARINC Specification 429
Certification	TSO C37d Class 3 and 5 and C38d Class C and E; DO-160C Categories /A2D2/ZCA/MNB/XXXXXXAAAZZUZ/XXE2/XX DO-186a, DO-207, and EUROCAE ED-23B, ED-67
Transmitter	
Output Power	25 watts (nominal)
Frequency Stability	±0.0005%
Modulation Level	90% modulation at 1000 Hz will be provided by not more than 100 mVrms at the microphone input

Leading Particulars
Figure 7 (Sheet 1 of 3)

CHARACTERISTICS	DESCRIPTION
Transmitter (cont)	
Audio Distortion	10% maximum at 90% modulation (1000 Hz); sidetone 7% maximum
Frequency Response	Within 6 dB from 300 to 2500 Hz
Spurious Radiation	Minimum of 110 dB from carrier level
Harmonic Radiation	Minimum of 100 dB from carrier level
Receiver	
Sensitivity	6 dB S+N/N for 2 μV (hard) signal modulated 30% by 1000 Hz
Frequency Stability	±0.0005%
Selectivity 8.33 kHz 25 kHz	 ±2.78 kHz at 6 dB; ±7.365 kHz at 60 dB ±8 kHz at 6 dB; ±17 kHz at 60 dB
Cross Modulation	Meets requirements of ARINC Characteristic 716-8, Section 3.6.4
Intermodulation	Meets ICAO Annex 10, RTCA DO-186a, and EUROCAE ED-23B and ED-67
AGC	Audio output will vary not more than 3 dB with inputs 5 μV to 200 kμV and not more than 6 dB to 500 kμV
Audio Output	50 milliwatts minimum into a 200 ohm to 600 ohm resistive load for 30% modulation at 1000 Hz
Audio Distortion	With 1000 μV input signal modulated 30% at 1000 Hz, total harmonic distortion will not exceed 5%
Audio Frequency Response	Within 6 dB from 300 Hz to 2500 Hz
Audio Output Regulation	Less that 0.8 dB voltage change from a 10 mW reference level into 600 ohms for resistive load variations of 200 ohms to 10,000 ohms NOTE: This specification reflects performance with a 20 ohm source impedance over ARINC Characteristic 716-8 load variations.

Leading Particulars
Figure 7 (Sheet 2)

CHARACTERISTICS	DESCRIPTION
Receiver (cont)	
Spurious Rejection	90 dB minimum
Image Rejection	80 dB minimum
SELCAL/Data Output	0.5 Vac into 600 (±20%) ohm load for 30% modulation at 1000 Hz
SELCAL/Data Response	Less than 3 dB output variation from the frequency range of 312 Hz to 1200 Hz and less than 6 dB from 300 Hz to 6600 Hz
SELCAL/Data Distortion	Less than 5% for a 1000 μV input modulated 30% at 1000 Hz producing 0.5 Vrms into 600 ohms
Phase Shift	There is no phase inversion through the receiver.
AGC Attack/Delay Time	Less than 50 milliseconds

Leading Particulars
Figure 7 (Sheet 3)

B. Environmental Certification

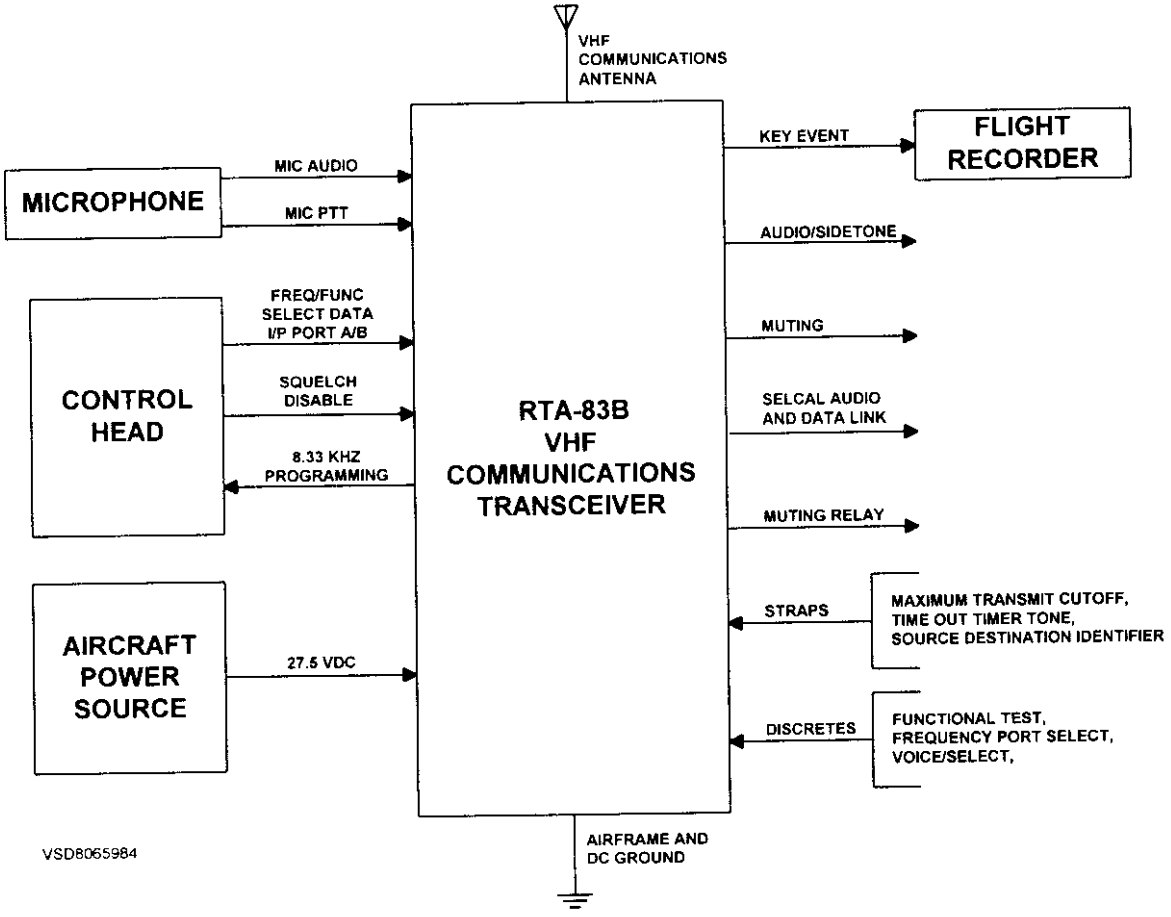
The RTA-83B VHF Communications Transceiver meets the environmental conditions of the Radio Technical Commission for Aeronautics (RTCA) document number DO-160C, "Environmental Conditions and Test Procedures for Airline Electronic/Electrical Equipment and Instruments." The environmental certification categories of the RTA-83B are /A2D2/ZCA/MNB/XXXXXXAAAZZUZ/XXE2/XX (see figure 8). The RTA-83B also meets 18-hour "no cooling-air test."

TEST	CATEGORY
Temperature and Altitude	A2D2
In-Flight Loss of Cooling	Z
Temperature Variation	C
Humidity	A
Operational Shocks and Crash Safety	Meets Specification
Vibration	MNB
Explosion Proofness	X
Waterproofness	X
Fluids Susceptibility	X
Sand and Dust	X
Fungus Resistance	X
Salt Spray	X
Magnetic Effect	A
Power Input	A
Voltage Spike	A
Audio Frequency Conducted Susceptibility - Power Inputs	Z
Induced Signal Susceptibility	Z
Radio Frequency Susceptibility (Radiated and Conducted)	U
Emission of Radio Frequency Energy	Z
Lightning Induced Transient Susceptibility	XXE2
Lightning Direct Effects	X
Icing	X

Environmental Certification Categories of RTA-83B
Figure 8

4. System Description

The RTA-83B VHF Communications System is an airborne VHF communications system designed to provide dependable, clear voice and data communication between on-board aircraft systems, to other aircraft systems, and to ground-based systems in the assigned 8.33-kHz and 25-kHz spaced channels of the 118.000 MHz to 136.992 MHz band and 118.000 MHz to 136.975 MHz band, respectively. Figure 9 is a simplified system block diagram.



RTA-83B VHF Communications System Block Diagram
Figure 9

5. System Component Description

A. RTA-83B VHF Communications Transceiver

The RTA-83B VHF Communications Transceiver is a lightweight VHF transmitter-receiver that provides double-sideband a-m operation in the 8.33-kHz spaced channels of the 118.000 MHz to 136.992 MHz band for voice communication. The unit also operates with double-sideband a-m operation in the 25-kHz spaced channels of the 118.000 MHz to 136.975 MHz band for voice and ACARS data communication. Frequency selection is entirely electronic; serial digital frequency selection system per ARINC Characteristic 429 is used to control the operation of the RTA-83B.

The RTA-83B is completely solid-state and is housed in a 3 MCU case per ARINC Characteristic 600. A handle is located on the front panel of the RTA-83B to facilitate installation, removal, and transport.

The RTA-83B operates in all aircraft cooling environments; however, optimum reliability is obtained when cooling with forced air in accordance with ARINC Characteristic 600. The RTA-83B meets 18-hour loss of cooling-air test.

An ITT/Cannon connector, type BKAFI-68100-50, is mounted at the rear of the unit to provide the interface between the transceiver and the system interconnect. Refer to figure 204 for the pertinent details.

The RTA-83B is partitioned into five subassemblies: transceiver assembly, analog/digital module, CMC Module, power supply, and rear interconnect module (refer to figure 10).

B. Other Components in the System

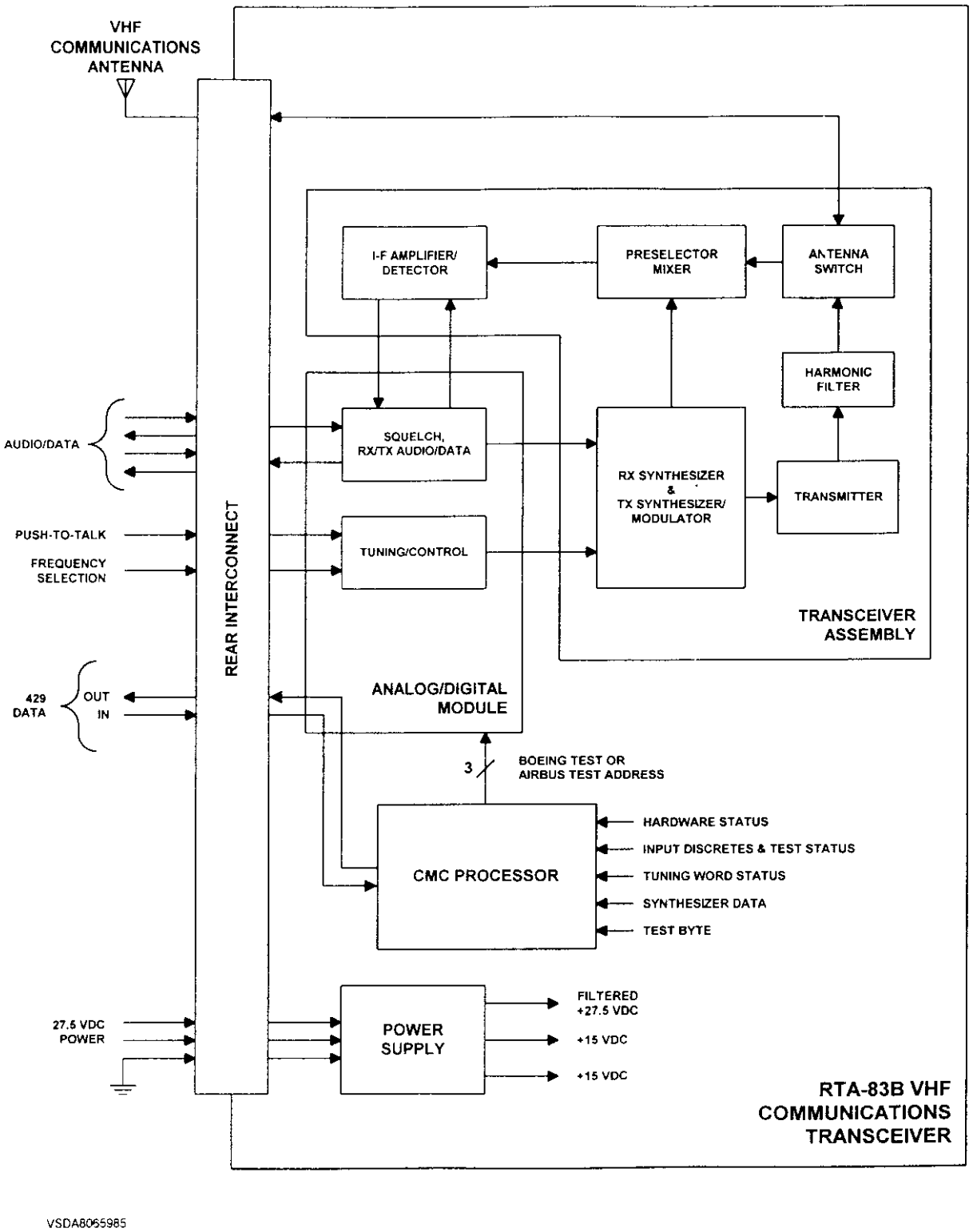
Other RTA-83B system components are not supplied by AlliedSignal Commercial Avionics Systems. Information on these units must be obtained from their respective manufacturers.

6. Operation

A. General

The RTA-83B VHF Communications Transceiver provides dependable two-way air to ground VHF communications in the assigned 8.33-kHz and 25-kHz spaced channels of the 118.00 to 136.992 MHz and 118.000 to 136.975 MHz band, respectively.

Operation of the RTA-83B VHF Communications Transceiver is controlled by a control unit which provides manual on/off control of the system power, squelch threshold, and operating frequency selection.



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RTA-83B VHF Communications Transceiver, Simplified Block Diagram
Figure 10

B. Basic Theory

(1) Transceiver Assembly

The transceiver assembly consists of an rf module assembly configured as a standard double sideband amplitude modulated (am) analog voice transceiver. When receiving, the RTA-83B rf module amplifies and converts the rf signals received by the antenna into analog signals for processing by the analog/digital module. Conversely, when transmitting, the rf module modulates the analog signals provided by the analog/digital module into rf signals for transmission through the antenna.

(2) Analog/Digital Module

The detected output (received analog signals) from the rf module is received by the analog section of the analog/digital module where squelch and all audio processing and amplifying is performed. The processed signals (data, voice, and sidetone outputs) are fed through the rear interconnect module to the aircraft audio circuits.

In the transmit mode, the microphone or data input is processed by the analog/digital module and fed to the rf module where the microphone or data input is modulated, amplified, and filtered before being transmitted from the antenna.

The digital section of the analog/digital module, checks the 429 tuning information for validity, and converts it to the proper format to tune the rf module synthesizers. The voice/data, receive/transmit, and other discretes are also processed by the digital section of the analog/digital module.

(3) CMC Processor Module

The CMC (Central Maintenance Computer) processor module interfaces with the analog/digital module to monitor hardware status, input discrete and test status, tuning word status, and synthesizer data of the RTA-83B.

The CMC processor module output defines which functional test (Boeing or Airbus) is to be initiated by the analog/digital module.

(4) Power Supply Module

The 27.5 volts dc aircraft power is converted by the power supply module into the dc operating voltages required by the various modules within the RTA-83B.

(5) Rear Interconnect Assembly

To prevent High Intensity Radiation Fields (HIRF) or lightning from affecting operation by entering via rear connector cables, a HIRF compartment is formed in the rear of the RTA-83B. The signal and power cables are filtered by using discrete and distributed filter elements and limiting devices on the rear interconnect module located inside this HIRF compartment. The filtered lines are then fed to the appropriate points in the RTA-83B.

FAULT ISOLATION

General

Fault isolation is the process of isolating the source of a system failure to an LRU (line replaceable unit) or to the aircraft wiring.

Fault isolation in the RTA-83B VHF Communications System includes a continuity check of the interwiring and the assurance that proper installation techniques and procedures have been followed.

A complete functional test of the system can be performed as described in paragraph 7.B. in the "Maintenance Practices" section 200 of this manual. System performance can also be determined by communications with ground facilities when available. If necessary, replace the RTA-83B VHF Communications Transceiver with a known good unit.

MAINTENANCE PRACTICES

1. General

This section of the manual provides service personnel with installation and maintenance information for the RTA-83B VHF Communications System. Installation instructions are supported by mechanical outline drawings and an electrical interconnection diagram. These drawings, located at the back of this section, should be reviewed by the installer, and requirements peculiar to the airframe should be established before starting the installation.

2. Inspection After Unpacking

CAUTION: THIS EQUIPMENT CONTAINS ELECTROSTATIC DISCHARGE SENSITIVE (ESDS) DEVICES. EQUIPMENT, MODULES, AND ESDS DEVICES MUST BE HANDLED WITH APPROPRIATE PRECAUTIONS.

Visually inspect the RTA-83B VHF Communications System and all associated equipments for possible damage which may have occurred during shipment. Inspect for dents, deep abrasions, chipped paint, etc. If any equipment is damaged, notify the transportation carrier immediately.

An AlliedSignal Commercial Avionics Systems (CAS) test and inspection record and quality report tag is included with each shipped unit. This ensures the customer that the necessary production tests and inspection operations have been performed on that particular unit.

One copy of the report tag is affixed to each unit by the first assembly inspector. As the unit proceeds through production and stock to the shipping area, the appropriate blocks on the test and inspection record of the tag are stamped. This tag accompanies the unit when it is shipped to the customer. Customers are requested to complete the quality report portion of the tag and return it to the AlliedSignal Commercial Avionics Systems (CAS), Quality Assurance Department, Olathe, Kansas. This portion of the tag provides the necessary information required to evaluate shipping methods as well as test and inspection effectiveness.

Completed cards are accumulated to provide information for a periodic analysis.

3. Preinstallation Testing

The components in the RTA-83B VHF Communications System have been adjusted and tested prior to shipment. Therefore, preinstallation testing is not required. However, if preinstallation testing of the units is desired, refer to the customer acceptance criteria given in the Component Maintenance Manual for the appropriate unit in the system. Refer to figure 4 in the "Description and Operation" section of this manual for a list of related Component Maintenance Manuals.

4. Equipment Changes and Marking

AlliedSignal Commercial Avionics Systems uses a standardized marking system to identify equipment and their subassemblies which have had changes incorporated. Refer to the front of the appropriate Component Maintenance Manual for a list of Service Bulletins affecting the unit.

5. Interchangeability

The RTA-83B VHF Communications System will operate in any installation that complies with ARINC Characteristic 716-8. Refer to system interwiring diagram figure 204 for particulars. Contact original equipment manufacturer (OEM) for certification status.

6. Installation

A. General

The RTA-83B VHF Communications System should be installed in the aircraft in a manner consistent with acceptable workmanship and engineering practices, and in accordance with the instructions set forth in this publication. To ensure that the system has been properly and safely installed in the aircraft, the installer should make a thorough visual inspection and conduct an overall operational and functional check of the system on the ground prior to flight.

CAUTION: AFTER INSTALLATION OF THE CABLING AND BEFORE INSTALLATION OF THE EQUIPMENT, A CHECK SHOULD BE MADE WITH AIRCRAFT PRIMARY POWER BEING SUPPLIED TO THE MOUNT CONNECTORS TO ENSURE THAT POWER IS APPLIED ONLY TO THE PINS SPECIFIED IN INTERWIRING DIAGRAM FIGURE 204.

B. Location of Equipment

Location of the RTA-83B VHF Communications System in the aircraft is not critical, as long as the environment is compatible with the equipment design. Refer to the Leading Particulars, figure 7, in the "Description and Operation" section of this manual. Forced air cooling is required for cooling the RTA-83B VHF Communications Transceiver in accordance with ARINC Characteristic 600. The

associated cooling equipment must be mounted in accordance with the manufacturer's instructions.

The RTA-83B can use the existing mounting tray or any other equivalent mounting tray that is compatible for securing a unit meeting the 3 MCU form factor per ARINC Characteristic 600.

Antenna mounting should be in accordance with the manufacturer's instructions for the antenna being used. The coaxial cable connecting the antenna to the mount should be as short and direct as possible and any required bends should be gradual. When two or more RTA-83B VHF Communications Systems are installed in an aircraft, it is necessary to provide adequate space isolation between antennas of each system to ensure that the use of one unit does not interfere with reception from another system. A minimum of 35 dB of space isolation should be provided, and any steps which can be taken to provide further isolation should be considered.

Control unit location and mounting can be determined by mutual agreement between the user and airframe manufacturer.

C. Interwiring and Cable Fabrication

(1) General

Figure 204 is a complete interwiring diagram for a single RTA-83B VHF Communications System and associated components. This diagram requires thorough study before the installer begins installation of the aircraft wiring.

When two systems are being installed in the aircraft, the interconnecting wiring shown in figure 204, as well as all other installation instructions must be duplicated.

Cabling must be fabricated by the installer in accordance with figure 204. Wires connected to parallel pins should be approximately the same length, so that the best distribution of current can be effected. AlliedSignal Commercial Avionics System recommends that all wires, including spares, shown on interwiring diagram figure 204 be included in the fabricated harness. However, if full ARINC wiring is not desired, the installer should ensure that the minimum wiring requirements for the features and functions to be used are incorporated.

NOTE: To allow for inspection or repair of the connector, or the wiring to the connector, sufficient lead length should be left so that the rear connector assembly can be pulled forward several inches when the mounting hardware for the test connector assembly is removed. A bend should be made in the harness near the connector to allow water droplets, that might form on the harness from condensation, to drop off at the bend and not collect at the connector.

When the cables are installed in the aircraft, they must be supported firmly enough to prevent movement and should be carefully protected against chafing. Additional protection should also be provided in all locations where the cables may be subject to abuse. In wire bundles, the cabling should not be tied tightly together as this tends to increase the possibility of noise pick-up and similar interference. When routing cables through the airframe, try to avoid running cables or wire close to power sources (400-Hz generator, etc). If unavoidable, the cables should cross high-level lines at a right angle, or high-quality shielded conductors should be used.

If a cable must pass through a bulkhead between pressurized and unpressurized zones, this passage must conform to the aircraft manufacturer's specifications.

The assembler must be knowledgeable of any system variations peculiar to the installation, and must thoroughly understand the complexities associated with handling related problems of line lengths, capacitance, and of susceptibility to interference.

The following determinants are the responsibility of the installation agency for fabrication of the wiring harness, see figures 201 and 204.

PIN NO.	TYPE	SIGNAL NAME	FUNCTION
MPA1	Input	Mic Audio Input (HI)	Microphone audio input. Part of the standard four-wire microphone interwiring as described in Attachment 6 of ARINC 716-8.
MPB1	Input	Mic Audio Input (LO)	

RTA-83B VHF Communications Transceiver Connector Determinants
Figure 201 (Sheet 1 of 5)

PIN NO.	TYPE	SIGNAL NAME	FUNCTION
MPC1	Input	Mic PTT	Microphone push-to-talk discrete input. Gnd/Low = Transmitter keyed; Open/High = Transmitter not keyed.
MPD1	Input	Key Event	Discrete input to Flight Recorder. Follows the state of Mic PTT input. Gnd/Low = Transmitter keyed; Open/High = Transmitter not keyed.
MPA2	Input	Max. Trans Time Cutoff Function	Discrete input that enables the maximum transmit cutoff function. Gnd/Low = Cutoff disabled; Open/High = Cutoff enabled.
MPB2	-	Spare	
MPC2	-	Spare	
MPD2	-	Spare	
MPA3	-	Spare	
MPB3	-	Spare	
MPC3	-	Spare	
MPD3	-	DC Ground	Required for ARINC 716-8 VHF COMM.
MPA4	Input	Functional Test	Discrete input that activates LRU functional test function. Gnd/Low = activate functional test.
MPB4	-	Spare	
MPC4	-	Spare	
MPD4	-	Spare	

RTA-83B VHF Communications Transceiver Connector Determinants
Figure 201 (Sheet 2)

PIN NO.	TYPE	SIGNAL NAME	FUNCTION
MPA5	Input	Data Link Data Input (HI)	Analog 2400 bps ACARS data input.
MPB5	Input	Data Link Data Input (LO)	
MPC5	-	Spare	
MPD5	Output	8.33 kHz Programming	Discrete output that indicates to the Control Panel that the unit is capable of 8.33 kHz or 25 kHz operation.
MPA6	-	Spare	
MPB6	-	Spare	
MPC6	-	Spare	
MPD6	-	Spare	
MPA7	Input	Freq/Funct Select Data I/P Port B (A)	One of two low speed 429 input ports to provide frequency tuning data.
MPB7	Input	Freq/Funct Select Data I/P Port B (B)	
MPC7	Input	Voice/Data Select	Discrete input that enables either the PTT key line (MPC1) or the Data key line (MPD7). Gnd/Low = Data key line enabled; Open/High = PTT enabled.
MPD7	Input	Data Key Line	Discrete input that keys the transmitter in data mode. Gnd/Low = Transmitter keyed; Open/High = Transmitter not keyed.
MPA8	-	Spare	
MPB8	-	Spare	
MPC8	-	Spare	

RTA-83B VHF Communications Transceiver Connector Determinants
Figure 201 (Sheet 3)

PIN NO.	TYPE	SIGNAL NAME	FUNCTION
MPD8	-	Data Key line Return	Provides return for data key line (MPD7).
MPA9	Input	SDI Bit 0 Prog	A discrete input pair prewired at the rear connector to identify the specific VHF radio location in the aircraft.
MPB9	Input	SDI Bit 1 Prog	
MPC9	-	SDI Prog Pin Common	Ground for the SDI code inputs.
MPD9	-	Reserved for AGC	Primary AGC Monitor used in laboratory testing.
MPA10	-	Spare	
MPB10	Input	Time Out Timer (T.O.T.) Tone	Ground for 1-kHz intermittent tone for 5 seconds after 30 second continuous transmit.
MPC10	-	Spare	
MPD10	-	Spare	
MPA11	Input	Freq/Funct Select Data I/P Port A (A)	One of two low speed 429 input ports to provide frequency tuning data.
MPB11	Input	Freq/Funct Select Data I/P Port A (B)	
MPC11	-	Spare	
MPD11	Input	Freq Port Select	Discrete input used to select either Frequency/Function Select Data I/P Port A or B. Gnd/Low = Select Port A; Open/High = Select Port B.
MPA12	-	Spare	
MPB12	-	Spare	
MPC12	-	Spare	
MPD12	-	Spare	

RTA-83B VHF Communications Transceiver Connector Determinants
Figure 201 (Sheet 4)

PIN NO.	TYPE	SIGNAL NAME	FUNCTION
MPA13	Output	SELCAL Audio and Data Link Output (HI)	An analog output to provide 2400 bps MSK data to the ACARS MU. May also be used for SELCAL provisions.
MPB13	Output	SELCAL Audio and Data Link Output (LO)	
MPC13	Input	Squelch Disable	A discrete input to provide squelch override or disable capability.
MPD13	-	Squelch Disable Return	
MPA14	-	Spare	
MPB14	-	Spare	
MPC14	-	Spare	
MPD14	-	Spare	
MPA15	Output	Audio/Sidetone Output (HI)	An analog output for receiver audio during receive mode and sidetone audio during voice transmit modes.
MPB15	Output	Audio/Sidetone Output (LO)	
MPC15	Input	Muting	An optional two wire discrete output to provide a switch closure internal to the VHF COMM for external system muting applications during transmit modes.
MPD15	-	Muting Return	
BP1	Input/ Output	Antenna RF Input/Output	Coaxial connection to RF antenna
BP2	Input	DC Power Input +27.5VDC	Required for ARINC 716 VHF COMM radio
BP3	-	Spare	
BP4	-	DC Power Gnd	Required for ARINC 716 VHF COMM radio
BP5	-	Spare	

RTA-83B VHF Communications Transceiver Connector Determinants
Figure 201 (Sheet 5)

(2) Reserved and Spare Wires

If the installer does not wish to connect all wires, he may select wires reserved for optional functions which his system does not contain and delete these wires. He should also decide which future spare wires to include in the installation. Reserved and spare wires are identified in figure 201 and in interwiring diagram figure 204.

D. Installation of System

(1) Mounting Base

The RTA-83B VHF Communications System units are secured in the airframe with mounting trays that can accommodate a unit that conforms to 3 MCU form factor per ARINC Characteristic 600. The mounts are designed to be removed without rewiring the connectors.

Dimensions for locating the mounting holes should be in accordance with the manufacturer's instructions for the mounting tray being used. When locating the mounts in the aircraft, allow at least one inch (2.54 centimeters) of free space on the top and sides of the unit. This will provide sufficient clearance for sway and ease of removal. Clean all mounting surfaces prior to positioning the mount in the desired location.

To wire the mounts into the system, first remove the mount connector cover and connector plate assembly. Then crimp or solder (as applicable) the interconnecting wiring to the appropriate connector pins. Finally, return the connector plate assembly and cover to their original positions.

(2) RTA-83B VHF Communications Transceiver

NOTE: To allow for inspection or repair of the connector, or the wiring to the connector, sufficient lead length should be left so that the rear connector assembly can be pulled forward several inches when the mounting hardware for the rear connector assembly is removed. A bend should be made in the harness near the connector to allow water droplets, that might form on the harness from condensation, to drip off at the bend and not collect at the connector.

The RTA-83B VHF Communications Transceiver is installed in the mount as follows:

(a) Slide the RTA-83B into the mount until the guide pins are aligned and the electrical connectors are firmly engaged.

(b) Secure the front of the RTA-83B to the mount by tightening the two knurled screw clamps (located on the front of the mount) until they are firmly seated over hold-down hooks located on the front of the unit.

(c) Safety-wire the two screw clamps.

(3) VHF Communications Control Panel

The selected ARINC 716-8 VHF Communications control panel should be wired according to system interwiring diagram figure 204 and the manufacturer's instructions. For installation procedures and mounting dimensions, refer to the manufacturer's instructions.

(4) VHF Communications Antenna

The selected ARINC 716-8 VHF Communications antenna should be wired according to system interwiring diagram figure 204 and the manufacturer's instructions. For installation procedures and mounting dimensions, refer to the manufacturer's instructions.

7. Inspection and System Check Procedures

NOTE: Inspection and check procedures for the RTA-83B VHF Communications System includes checkout of all interfacing units that may affect performance of the RTA-83B.

A. Inspection

Figure 202 is a visual inspection check procedure and should be performed after system installation, prior to system checkout. In addition, the procedure should be used as a periodic inspection check.

EQUIPMENT	INSPECTION/CHECK PROCEDURE
3 MCU Unit Mount	As defined by manufacturer's instructions.
RTA-83B VHF Transceiver	(1) Check that unit is fully inserted in mount and that the knurled screw clamps which secure the unit in the mount are tight and safety wired.
	(2) Inspect the case for deformation, dents, corrosion, and damage to finish; ensure that ventilation holes in the unit are not clogged.
ARINC 716-8 Control Panel	As defined by manufacturer's instructions.
ARINC 716-8 VHF Antenna	As defined by manufacturer's instructions.

Inspection/Check Procedures
Figure 202

B. System Checkout

(1) General

After installation of the RTA-83B VHF Communications System, and inspection of the equipment per previous figure 202, perform a continuity and visual check of the system interwiring per paragraph 7.B.(2). A post-installation test per paragraph 7.B.(3) should then be performed.

(2) System Interwiring Check

Visually check the system interwiring for abnormalities, such as cables rubbing unprotected metal edges or tightly stretched cables. Check continuity of all interwiring. In particular, check the following:

(a) Check that the RTA-83B is properly installed and the hold-down screw clamps are tight.

(b) Check wiring harness connectors for security and connection to the RTA-83B.

(c) Check that antenna transmission line connectors are securely fastened.

(d) Check that cables do not interfere with aircraft controls or other equipment.

(3) Post-Installation Check

(a) Test Equipment Required

None Required.

(b) System Test

1 Establish the initial control settings listed below.

ARINC 716-8 CONTROL	POSITION
Power	on
Frequency Selector	Tune to any local VHF frequency
Volume Control	midway

2 Using the system's headphone (or speaker) and microphone, check operation of the RTA-83B VHF Transceiver.

3 Key the microphone and speak into it; speech should be audible.

4 Listen through the headphones (or speaker) and press the SQUELCH DISABLE pushbutton. A squelch break should be audible through the headphones.

5 As soon as possible, local flight check should be made to verify system operation for both local and distant stations.

C. Flight Tests

(1) Preflight Test

(a) General

The following test procedure gives instructions for a preflight test which ensures that the RTA-83B VHF Communications System is functioning in an acceptable manner prior to takeoff.

(b) Test Procedures

Repeat the test procedure found in paragraph 7.B.(3)(b).

(2) In-Flight Confidence Test

Upon completion of the post-installation and preflight checks, a local flight may be made to verify system operation for both local and distant stations. Repeat the test procedure found in paragraph 7.B.(3)(b).

8. Removal and Replacement

A. Removal

(1) Loosen the two knurled screw clamps (located on the front of mount) that secure the RTA-83B to the mount.

(2) Gently pull the transceiver forward until it is disconnected from the rear connector and guide pins.

B. Replacement

(1) Slide the RTA-83B onto the tray of the mount and then gently push the transceiver until the guide pins are aligned and the connectors make a firm connection.

(2) Tighten the two knurled screw clamps located on the front of the mount until they are firmly seated over the hold-down hooks located on the front of the transceiver.

(3) Safety wire the two knurled screw clamps.

9. Maintenance Procedures

A. Adjustments and Alignments

There are no adjustments or alignments required for the RTA-83B VHF Communications System. All alignment and adjustment procedures are accomplished during bench maintenance. The technician should remove the unit from the aircraft and reference should be made to the related component maintenance manual when unit performance indicates an adjustment or an alignment is required.

B. System Protection

The system should be protected by a 10-ampere circuit breaker located at the circuit breaker panel in the aircraft.

C. Lubrication Practices

There are no requirements for periodic lubrication of any RTA-83B VHF Communications System components while mounted in the aircraft. Reference should be made to the applicable component maintenance manual for lubrication procedures during routine maintenance of individual units. Refer to figure 4 in "Description and Operation" section 1 for a list of related component maintenance manual publications.

D. Cleaning

When deemed necessary, depending upon the environment to which the equipment is exposed and the intensity of use, periodic cleaning should be performed. Any dust on the RTA-83B VHF Communications System LRU's should be wiped off with a lint-free cloth.

NOTE: Any cleaning of equipment interiors should be limited to that required when performing overhaul (bench-type) work.