



ACH1000 (P/N: 100260)

Control Head for Voice and Data Communication

Installation Guide

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INTRODUCTION

APPLICATION

This guide is applicable to the following components:

Part Number	Component Description
100140A or 100240	D1000A or D1000C Modem Unit
100259	ACH1000 Installation Kit
100260	ACH1000 Control Head
Notes	

OVERVIEW

The information contained in this manual describes the features, functions, technical characteristics, components, approval procedures, installation considerations, setup procedures, checkout procedures and instructions for continued airworthiness for a BLUE SKY NETWORK ACH1000 Control Head for Voice/Data Communication.

Information, drawings and wiring diagrams contained in this manual are intended as a reference for engineering planning only. Drawings and wiring diagrams contained herein do not represent any specific aircraft installation. It is the installer's responsibility to create installation drawings specific to the aircraft. This manual, and drawings and wiring diagrams, contained herein may not be used as a substitute for any drawing package.

SYSTEM DESCRIPTION & OPERATION

SYSTEM DESCRIPTION

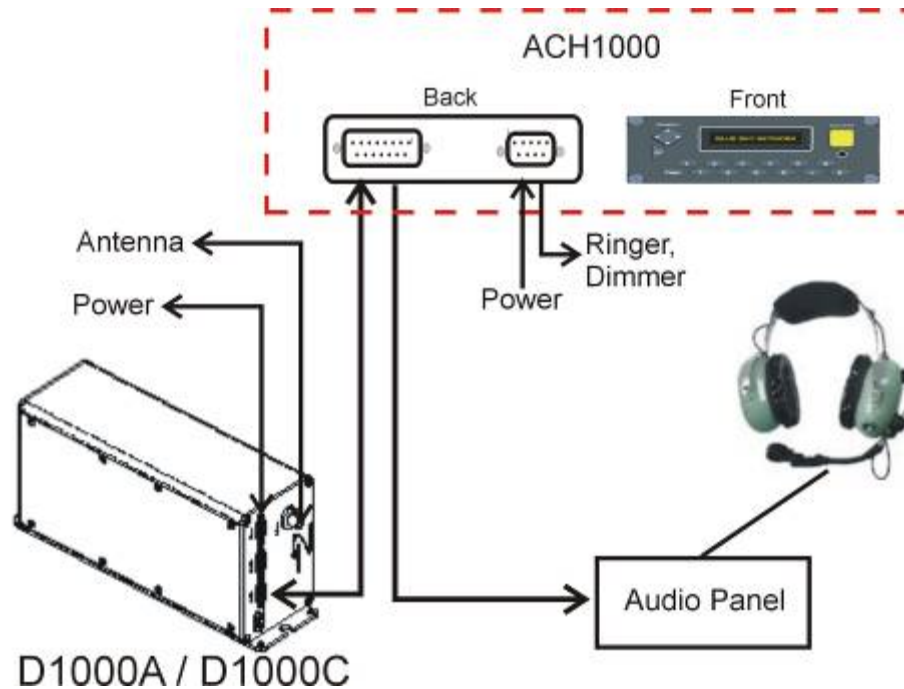
General

The Blue Sky Network ACH1000 Control Head for Voice/Data Communication provides next generation satellite data and voice communications to and from aircraft on a global scale. This affordable and robust terminal provides a simple user interface to control and manage the information flow to and from the cockpit, providing users with complete communication capabilities to make/receive calls, exchange data with operators and fleet administrators, and offer effective asset tracking.

All data services are managed by the customer through our asset management portal SkyRouter (www.skyrouter.com). SkyRouter offers global asset tracking and two-way messaging to and from any computer connected to the Internet. It also offers account management features, such as user and fleet management, and billing information. Access to SkyRouter is highly reliable and secure.



Diagram



ACH1000 FEATURES

- **System Status:** the ACH1000 provides the GPS and Iridium signal strengths, Iridium network registration and D1000C synchronization information.
- **Voice Communication (PHONE):** this option allows the pilot to use either the "Speed Dial" mode to call one of the pre-stored numbers or "Standard Dial" when entering a new number. The audio should be interfaced to the aircraft audio panel and/or intercom system (see wiring details).
- **Data Communication (MESSAGE):** this option allows the user to send pre-stored short messages and to read and acknowledge incoming short text messages (up to 200 characters).
- **Data Communication (FLIGHT PLAN):** this option allows the crew to send a flight plan to SkyRouter. Please note that this is not a formal filing of a flight plan, but just used for informational purposes for users of SkyRouter.
- **SETUP:** The setup menu provides features such as Volume, Brightness, Contrast control. This way the user can control the volume when making/receiving calls and the intensity of the front panel backlight. The ACH1000 can also be reset from this menu option.

Please refer to the ACH1000 User Guide for further information on operating the product.

FAA/JAA APPROVAL

GENERAL

Acceptance for the installation and use of the ACH1000 must be sought through the appropriate offices of the Federal Aviation Administration (FAA), Joint Aviation Authorities (JAA) or other certifying agency.

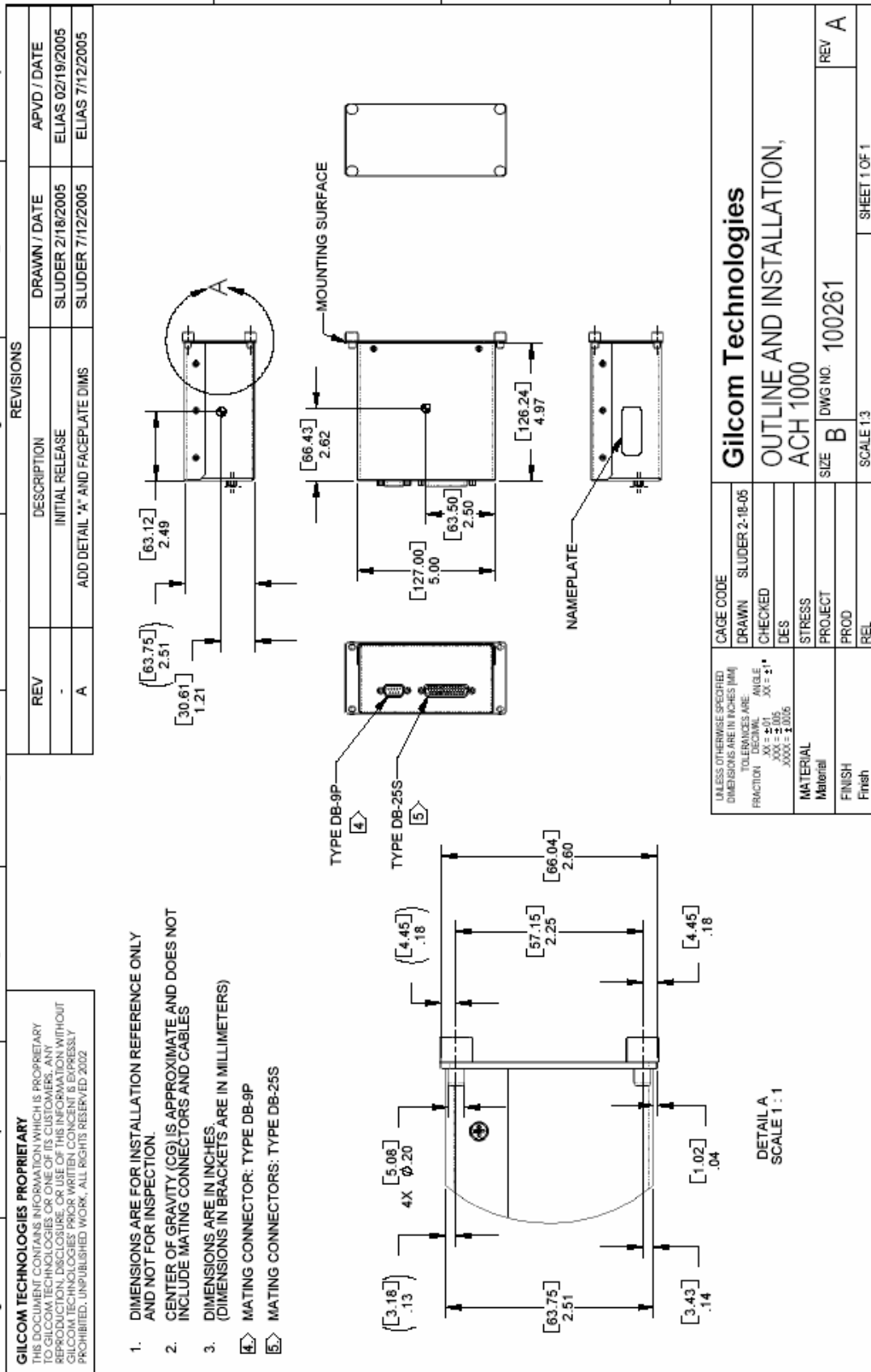
The ACH1000 System is approved by the FAA (Federal Aviation Administration) as compliant with the airworthiness requirements as defined in 14 CFR (Code of Federal Regulations), Part 23.

STC Number: SA01588LA (rev. F) – Cessna 414A Series as amended November 16, 2005.

EQUIPMENT SPECIFICATIONS AND DRAWINGS

BLUE SKY NETWORK ACH1000 SPECIFICATIONS

Height	Maximum 2.6 inches (6.4 cm)
Width	Maximum 5.75 inches (14.6 cm)
Depth	Maximum 5.0 inches (12.7 cm)
Weight	1.2 pounds
Power Requirements	18VDC - 32VDC
Audio Specs	Mic: 12VDC Bias / Ear: 600 or 8 ohm (software selected)
Nominal Current	< 0.2A Continuous, < 0.5A Peak (at 24VDC)
Operating Temperature Range	-20 degrees C to + 60 degrees C
Altitude	Up to 50,000 feet
Display Indicators	Synchronization with D1000C Iridium and GPS Signal Strength Message Waiting Incoming Call Call Status
FAA Certification	DO-160D / STC



INSTALLATION & WIRING

LICENSE REQUIREMENTS

The ACH1000 Control Head has no licensing requirements.

COOLING AIR REQUIREMENTS

The ACH1000 has very low power usage so forced air cooling is not required for any of the components. However, units should be kept away from heat sources.

AIRCRAFT INTERFACES

The ACH1000 operates independent of aircraft navigation systems. Therefore, no aircraft interface is required other than optional interface to the audio controller and the 18-33Vdc Power Input, Power Return and Chassis Ground.

Power Input

The ACH1000C requires aircraft power.

The ACH1000 power interface supports wide voltage input in the range of 18V to 33V DC. The following input connection is the most commonly used:

28 VDC nominal, typically less than 0.5A (up to 1A max)

A circuit breaker is recommended to protect the aircraft power distribution system.

EQUIPMENT REQUIRED BUT NOT SUPPLIED

1. Circuit Breaker
2. Interconnect Wiring for power
3. Interconnect Wiring for data and audio
4. Mounting Hardware

WIRE HARNESS FABRICATION & INSTALLATION CONSIDERATIONS

Referring to the appropriate section of this manual, assemble a wiring harness as required for the installation. All wires must be MIL-SPEC in accordance with current regulations. Two-conductor shielded wire must be used where indicated and be MIL-SPOEC-27500 or equivalent specification. Shields should only be grounded at the Modem Unit end of the interconnect cable. Other ends remain floating.

It is imperative that the correct wiring be used and that proper stripping, shielding, grounding, crimping and soldering techniques be used at all times. Failure to correct techniques may result in poor performance, electrical noise or unit failure.

Power Wiring

To assure that the ACH1000 will operate properly down to its rated minimum input voltage, ensure that power wires of at least the recommended size are connected in accordance with the installation drawings. It is recommended that power and ground wires are a twisted pair to reduce signal noise.

Ground Bonding

In order to assure installation characteristics match the DO-160 RF and Lightning test conditions, ensure that ground wires of at least the recommended size are installed and these wires are connected to a bonded aircraft ground.

Note: The ACH1000 needs to be grounded for proper operation. See Pinout tables for correct pin information.

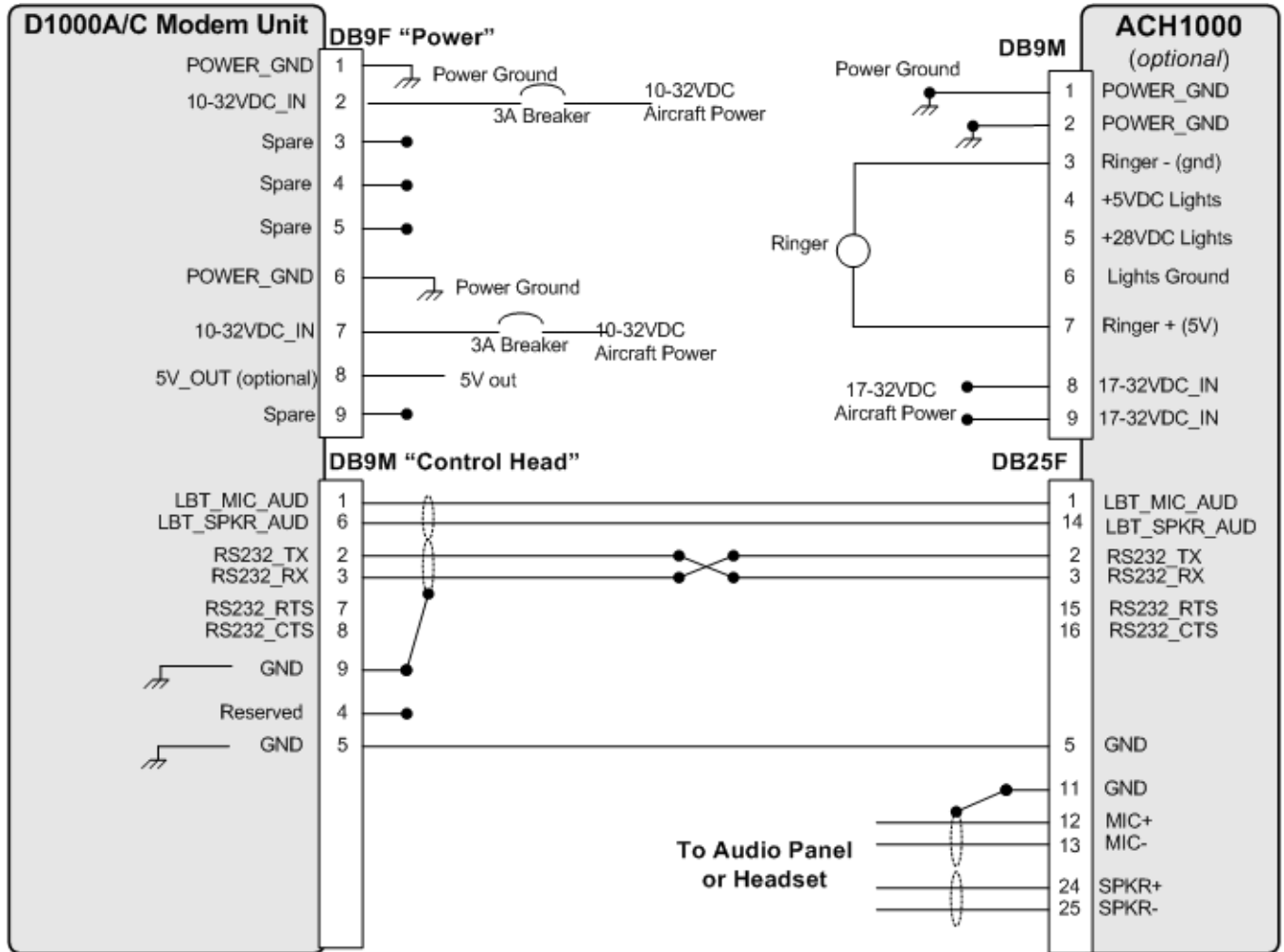
Cable & Wire Harness Routing Considerations

- The length and routing of cables must be carefully planned before starting the installation.
- Avoid sharp bends in the cable.
- Do not locate the cable near aircraft controls.
- Observe all appropriate sections of FAR Parts 23, 25, 27, and 29, as well as AC 43.13-1B and AC 43.13-2A. Damage caused by improper installation will void product warranty.
- In order to ensure optimum performance, the ACH1000 and associated wiring should be kept a minimum of three feet from high noise sources and not routed with cables from high power sources.

Optional Visual/Audio Alert Feature

A 5V ringer (examples: Mallory SC307N and SNP2) or a 5V LED can be connected to the ACH1000 DB9 connector (between pins 3 and 7) in order to signal incoming calls or messages (see next page's *Wiring Diagram*). The alert signal is grounded, lit (on pin 3) when there is an incoming message to be read or pulses if it is an incoming call.

WIRING DIAGRAM



Notes:

(1) Aircraft dimming control can be used with the ACH1000 (DB9 pins 4/5/6). Default is disabled. To enable the external dimming control on the ACH1000 unit, select "Brightness" under the "Setup" option and decrease brightness levels until reaching "Dimmer" option, then press OK.

(2) The 4-wire audio signals can be used to interface the ACH1000 to INTERCOMs or standard audio panels. For example, this system can be installed with a PMA7000B audio panel (from PS Engineering) by connecting its pin 12 to J1-K, pin 24 to J1-J, and both pins 13 (mic-) and 25 (spkr-) to J1-1.

(3) If the installer experiences extreme audio noise during system test (which is usually caused by the low frequencies presented on the power lines), it is recommended to disconnect wires/pins 1, 2 and 6 of the DB9M Power Connector of the ACH1000, as the unit will use DB25F pin 5 as the ground reference (ACH1000 has only one ground plane, the common ground). By disconnecting these wires, the installer could potentially eliminate the noise source ("ground loop").

ACH1000 INSTALLATION

The exact location of the ACH1000 is at the option of the installer, but its DZUS mount compatibility makes it best suited for cockpit panel placement. It is important that the ACH1000 is located in front of the pilot in order to allow easy access and visualization.

GROUND TEST & OPERATIONAL FLIGHT CHECK PROCEDURE

After the ACH1000 has been successfully installed, you may use this procedure to check for accurate communication between the ACH1000 and its D1000 unit.

Before turning on the power to the D1000A/C or the ACH1000, make sure that the installation is complete. Turn on the power to the D1000 and the ACH1000 at the same time. After 10-20 seconds you will see the “Reset”/“Updating...” message on the ACH1000 display. If you see this message and then it terminates with the Main Menu, the ACH1000 has been installed correctly and is properly synchronized with the D1000. Just as a second check, one should be able to see the D1000 firmware version through the ACH100 LCD screen by:

- 1- Scrolling down (in the ACH1000 Main Menu) until selecting “Setup”;
- 2- Scrolling down again and selecting “Version”;

Here, the user will be able to see the ACH1000 and the D1000 firmware versions (if properly installed).

Another important item to test is the *QuickPOS* button functionality, as this is used in emergency situations. Once the ACH1000 is on and stable, press the *QuickPOS* button (yellow, to the right of the screen) and observe its behavior. If working correctly, the button’s LED should blink while the ACH1000 screen displays a message that the *QuickPOS* button is active. After confirming its functionality for 10 or 15 seconds, press the *QuickPOS* button again to disable this function and get back to standby mode.

The required logbook entries and FAA approvals are the responsibility of the installer and Blue Sky Network assumes no responsibility for either obligation.

MAINTENANCE

Aircraft Annual Inspection Considerations

During the aircraft annual inspection:

- Visually inspect the installation for loose fasteners or corrosion
- Perform a functional check of the system (ex: send/receive data).

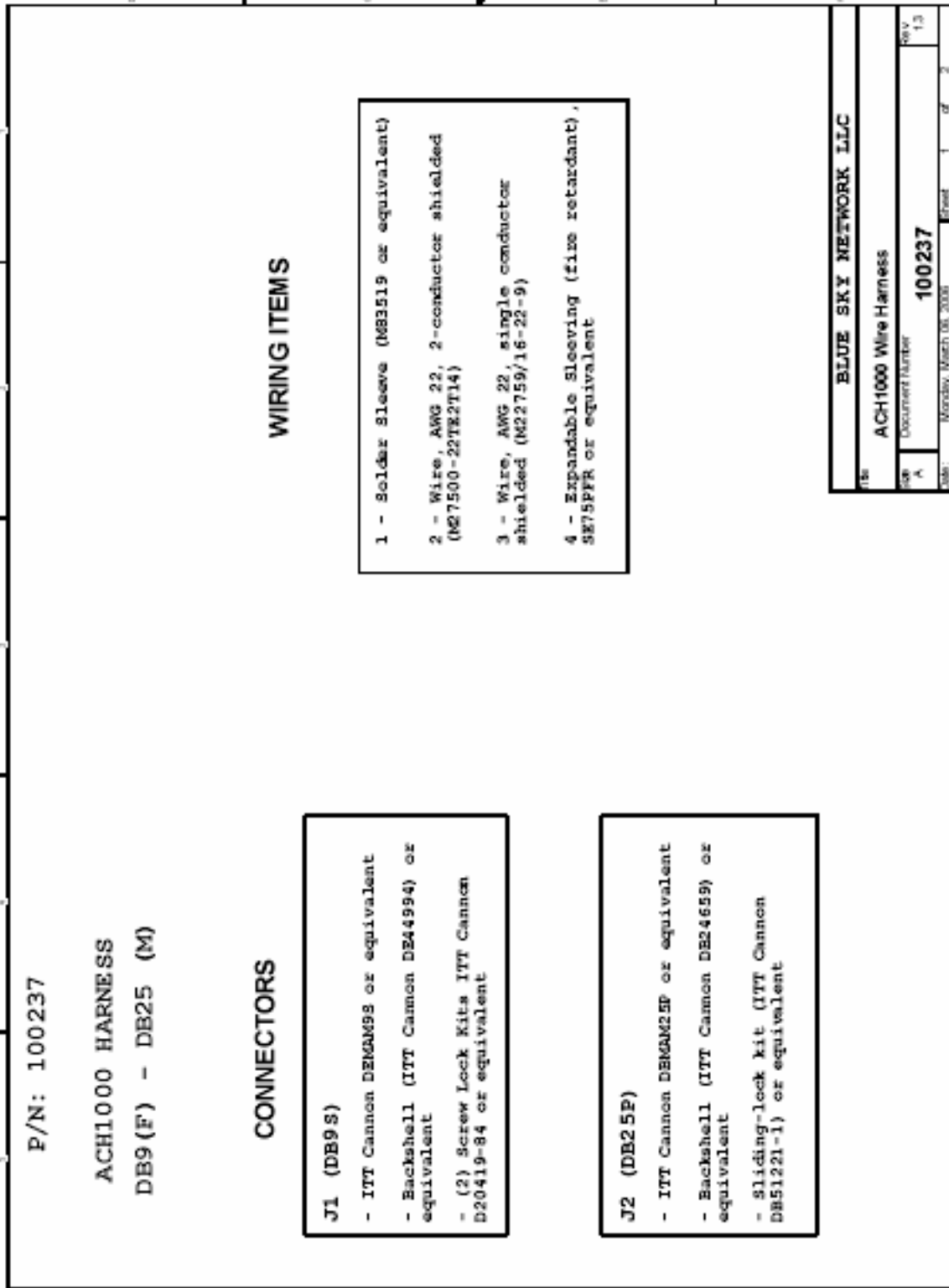
SERVICE ACTIVATION

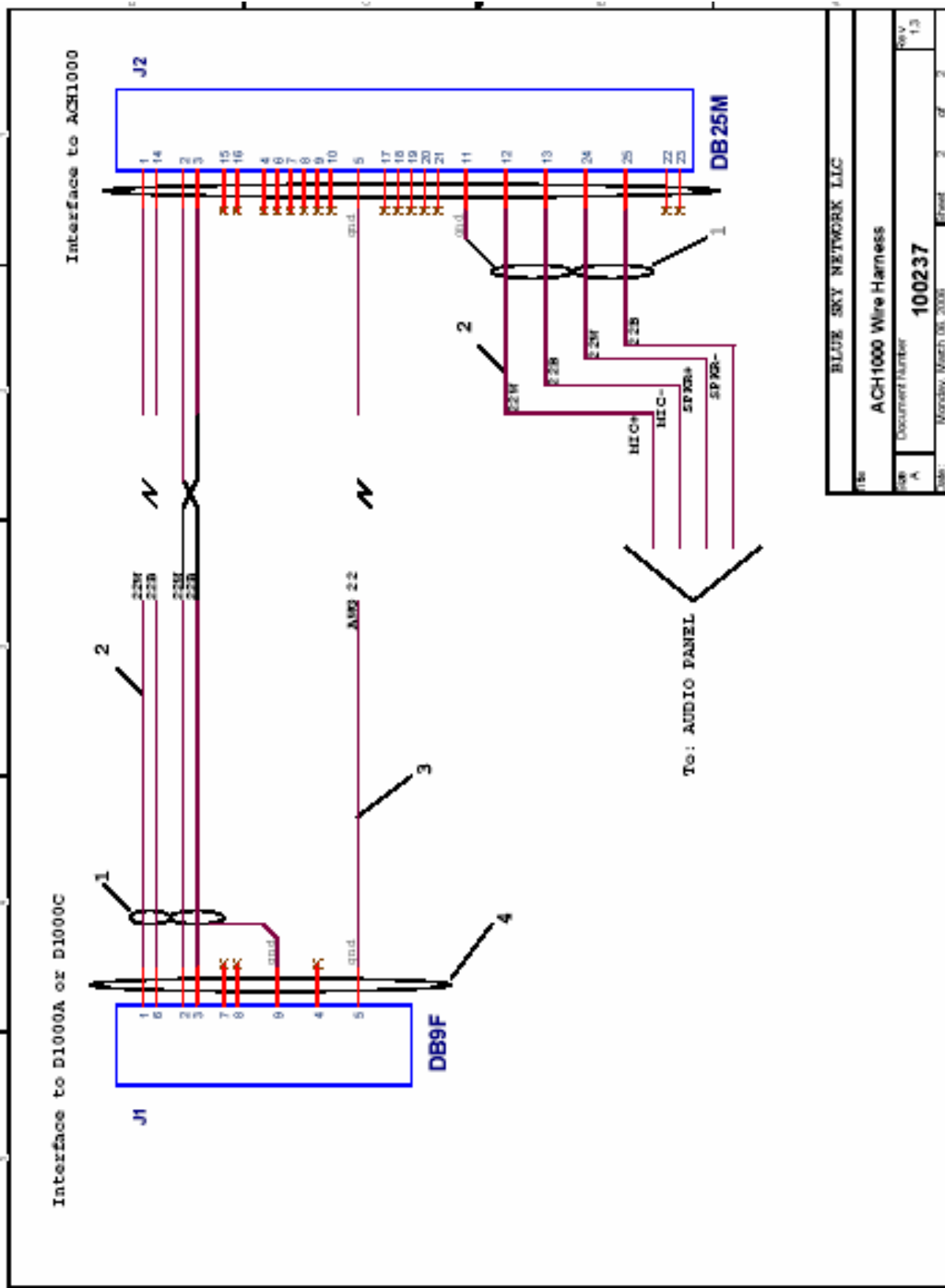
A commissioning or service activation must be performed to activate the SIM card inside the D1000 or D1000C so the system can be used to place and receive calls and send/receive data messages (ACH1000 requires the activation of BOTH data and voice services). The ACH1000 has no licensing requirements. Service Activation consists of the following steps:

1. Connect to the Blue Sky Network web site and review the Service Plan options available.
2. Obtain, by contacting Blue Sky Network, and complete the Service Agreement form and choose a service plan to fit your needs. This information on the form is used to set up your account and complete the SIM card activation. Once the information is completed and the credit card approved, the SIM card activation can normally be completed in about an hour. Your phone number will be verified at this time.

WIRING

WIRE HARNESS ACH1000 TO D1000A/C (DB9F – DB25M)





ACH1000 POWER CABLE

If the power harness between the circuit breaker and the ACH1000 is less than 10', there is no need to connect two PWR wires and two GND wires to the D-Sub connector (the diagram below shows the case scenario for a long wiring scheme – above 10'). The ACH1000 should work without problems if the installer chooses to only connect GND to pin 1 and PWR to pin 9. One single breaker (for example, 3A) should be enough to cover both the D1000A/C and ACH1000 systems.

