FACTORY TRAINING

The Southern Avionics factory training course offers lectures, 'hands-on" training and in depth discussions on all aspects of NDB ownership and operation.

The following topics are covered:

- Overview of NDB technology
- Low frequency transmission and antenna theory
- Basic operation of NDB equipment
- Detailed circuit theory
- Installation considerations and 'best practices'
- Factory Acceptance tests
- Site Acceptance tests
- Preventive maintenance procedures
- Troubleshooting and fault resolution
- Southern Avionics technical support procedures
- Warranty policy and returns
- Overview of Southern Avionics' history, products, and quality processes

Prerequisites:

- In order to get the full benefit of the training course, Students are required to have a good working knowledge of electronics, technician-level RF experience and related skills.

- The training course is delivered in the English language, so Students are required to speak, read and write in English.

- Class size is limited to a maximum of ten (10) students

The training course is held at our factory located at 5055 Belmont Street, in Beaumont, Texas U.S.A.

Classes are scheduled 9:00 a.m. to 5:00 p.m., Monday through Friday, with a one (1) hour lunch break.

Upon successful graduation from the course, a Certificate of Completion will be given to each student.

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Five Day Factory Training Course
Basic Outline

1. FAMILIARIZATION:

After a brief orientation and tour of the facility, Students will be given an overview of NDB technology and applications; and the specific equipment that will be covered in the training.

The technical handbook and installation and set up manuals will be reviewed and discussed. Any initial questions from the students will be answered and discussed.

2. THEORY:

Theory of operation of the NDB system will be discussed in depth. The table of contents (Sections 2, 3 and 4) in the technical manual which is a good course outline for this section.

Depending on the level of technical knowledge and interest of the students, circuit theory of the transmitter, antenna coupler theory, or antenna theory can be emphasized with time spent on each section accordingly.

3. INSTALLATION AND OPERATION:

The student will connect the system as it comes from the shipping box and then tune-up the system into a dummy antenna following installation and operation procedures in Section 5 of the manual.

4. MAINTENANCE:

This section covers alignment, adjustment and calibration that are done at the factory as part of our standard Factory Acceptance Test before the equipment is sent to the customer.

Waveforms and voltages at all test points will be discussed to further familiarize the student with the normal operation of the system. With knowledge of waveforms and voltages at all test points, the student should be able to quickly isolate a problem should one occur in an actual installation.

5. TROUBLESHOOTING:

To further familiarize the student with the equipment and to test his ability to correct a problem, he will be asked to troubleshoot at and provide solutions to a variety of systems faults.

Five Day Factory Training Course
Detailed Description

It is the goal of the Southern Avionics Factory Training Course to provide a practical understanding of all aspects of NDB ownership and operation.

By necessity, this approach requires a real time evaluation of the student's experience, interest, capability, educational background, and acumen.

Among our course instructors are the engineers and technicians who deal with the conception, design, manufacture, installation, and customer support of the Southern Avionics equipment.

Based on our evaluation of the student's capabilities, each course is based on the expressed interests and needs of the individual students.

The COURSE OUTLINE is somewhat ambiguous as we are totally unaware of prospective student's abilities. Our NDB systems are not by nature difficult to learn, and in the 45+ years of experience we have learned that every class is as different as the students are. Further, we have learned that "canned instruction" is not practical, which is contrary to our goal.

In general, the course proceeds as follows:

1. Familiarization:

The first time slot is filled with a brief company tour and introduction to the NDB system components that will be the focus of the training course. The instructor begins to assess and become familiar with the background and acumen of each student while encouraging an open line of communication. This dialog builds confidence in the students as to the instructor's ability to lead the course.

A general overview of is made, explaining various applications of the NDB; how a pilot utilizes the signal; practical considerations in locating the installation site; as well as a general question and answer session.

In this time period the student gains a practical awareness of the equipment on which they will train, as well by as be given a preliminary review of the technical manuals.

The student is encouraged to look over the equipment manuals and become familiar with the style and function of the manuals after hours.

2. Theory:

Based on the results of the previous time slot, the instructor opens his discussion on general theory. During this time the instructor will further gauge the technical acumen of the student and adjust the curriculum as necessary.

As a rule, the least understood aspect of the NDB system is the antenna system. We have learned over the years that 90% of the unreliability or failure of an NDB system is a result of an antenna problem. Because of this we focus on LF/MF antenna theory, practical antenna designs and considerations, and share our knowledge base of worldwide antenna experience.

At the close of this session, each student will be familiar with and understand Low and Medium Frequency antennas.

The period is interspersed with verbal tests and practical calculations as well as theoretical discussion of general communication antennas and principles in order to discern the differences in experience among the students.

Because of the overall importance and vital necessity of a stable and functional antenna, the majority of the first day and at times a portion of the next are spent on the antenna system.

The next time period is spent on the Antenna Tuning Unit (ATU) or the antenna coupler and those aspects of the ATU not covered or explained in the antenna discussion. This generally involves one half day.

Next, is the discussion of the NDB transmitter beginning with a block diagram. As the class progresses, the functionality of each block is further subdivided to the depth that the students have questions or that instructor gauges relevance.

At the least, the student will be exposed to and expected to understand signal creation, flow, adjustment, calibration, verification and testing. Some of this understanding requires component level theory and applications, and is so taught. The content of this period includes, but is not limited to frequency generation, transmitter Morse code keyer, power supplies, modulators, transmitter control, etc.

As a rule, at least one course day is spent on the transmitter. Again, the period is also interspersed with verbal “pop tests”, practical calculations, considerations, safety issues, as well as theoretical discussion of general communication transmitters to meld the differences in experience. The student is now encouraged to study sections 2, 3, and 4 of the equipment manual after hours.

3. Installation and Operation:

While in the classroom environment, and during the discussions of the antenna, ATU and transmitter, many of the theoretical and practical aspects of the operation and installation of the equipment have been touched upon, if not thoroughly discussed.

During this time period, generally on the third day, further considerations involving the installation and operation such as the interconnection and interface of the various system components are covered. Typical equipment of the same or equal type is displayed for the student. The student must demonstrate the location, type, and expected results of each control and adjustment on the transmitter system.

It is also in this time that the instructor becomes further aware of the particulars of the students specific installations. Expert help and recommendations are offered to ensure that the NDB systems will be installed in such a manner that will allow the end user many years of reliable and trouble-free operation.

After this session, the student is again encouraged to look over and study the installation manuals because the instructor expects the students to ask detailed questions in the next session.

4. Maintenance:

The "hands on" portion of the course is continued during this fourth time slot. The equipment is powered up and a detailed inspection of test points, waveforms, performance benchmarks, test equipment usage, etc is performed and recorded. Again, practical experience, techniques, problems and solutions are shared with the student.

It is generally at the end of this time period that the student has achieved confidence in the equipment as well as his own ability to operate and verify its performance. The student will have adjusted the operating frequencies (RF, key rate, audio tone), demonstrated programming and reprogramming techniques of frequency, identification, establish operating levels, calculate and verify system impedance, antenna current.

The student will have completed and verified the calibration of all field and factory settings. After a series of practical on the spot tests, demonstrations of familiarity, and a show of prowess, the next session commences.

5. Troubleshooting:

First, the instructor reviews routine operational procedures. Next, performance benchmarks are again verified and recorded. After this, a variety of both field and factory classification problems, are introduced into the equipment. These problems range from actual component failure to simulated antenna problems.

At this point, in classes of a permitting size, and under the watch of the instructor, the students are challenged against each other in the introduction of and solutions to various equipment failure modes. At the end of this session, the students generally have a heightened respect for the equipment and each other's ability to locate and remedy faults.

At the conclusion of this period, a general debrief occurs, with discussions, questions and answers on all subject matter from the start of the course. At this juncture, the instructor's ability to transfer information is tested through the administration of a 100-question equipment and basic electronics theory multiple-choice test. A satisfactory grade of at least 80% is expected, and all questions incorrectly answered are reviewed until the question and answer is fully understood.

Upon satisfactory completion of the course, a Certificate of Training is issued to each student.