

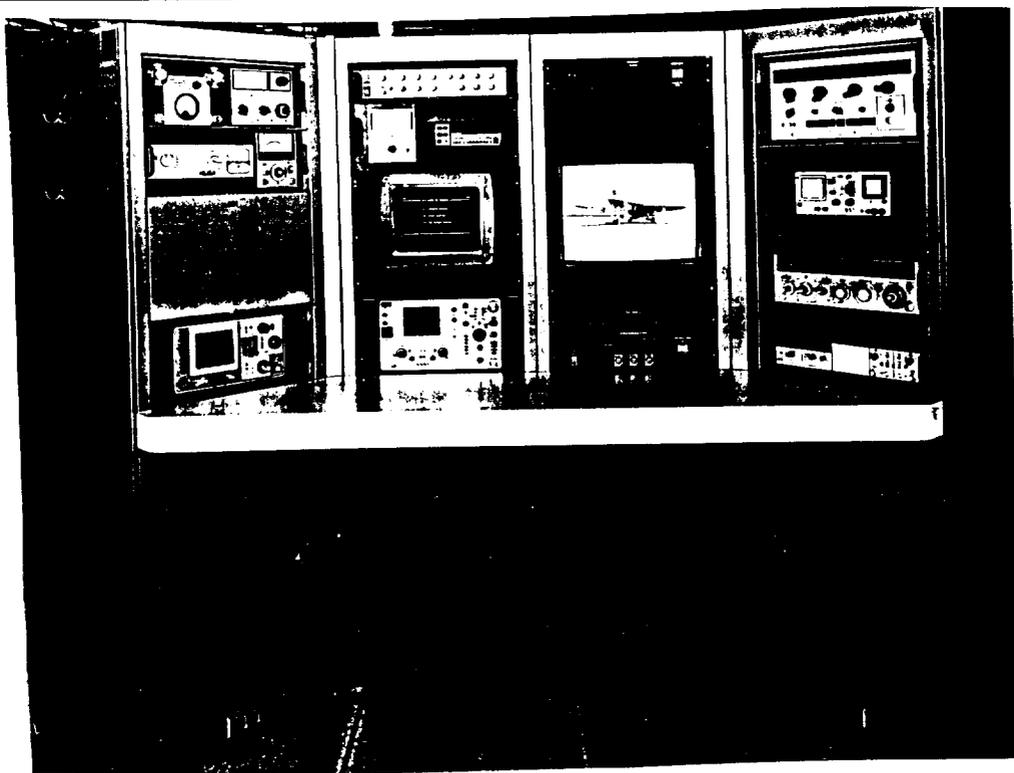
SUMMARY OF  
ADVANCED FIRST TERM AVIONICS (AFTA)  
MAINTENANCE TRAINER

September 1988

Device 11B108

NAVAL TRAINING SYSTEMS CENTER

ORLANDO, FLORIDA



**TRAINING CATEGORY:**

MAINTENANCE TRAINER

**ORIGINATING AGENCY:**

DCNO/AIR

**SECURITY CLASSIFICATION OF  
DEVICE:**

Device 11B108 is unclassified.

**PURPOSE OF DEVICE:**

To provide real world fault simulation of avionics weapon systems for both organizational and intermediate level maintenance training.

**INTENDED USE:**

In AVSI (Avionics Systems Integration) School for classroom instruction of Navy petty officers and equivalent Marine Corps personnel with AT, AQ, and AX ratings in the use of test equipment and test procedures.

**FUNCTIONAL DESCRIPTION:**

Device 11B108 is an electronic avionics maintenance trainer used for training

operational, maintenance, testing, and troubleshooting tasks related to a generic avionics system. The trainer consists of 1 instructor station, 15 student stations, and 1 peripheral controller configured as a distributed computer system. The instructor station, peripheral controller, and each student station are driven by a dedicated single board computer (SBC) with inter-computer communication over the local area network (LAN) known as Ethernet.

At each student station, thirteen pieces of standard test equipment and one piece of automatic test equipment are simulated. The front panels of the simulated test equipment are physically and functionally identical to the actual test equipment, reinforcing student recall of the test equipment's configuration. Test equipment indications, readings, and printouts are software generated. The simulated test equipment is used to troubleshoot the simulated avionics system. The data base for the avionics system equipment consists of a set of photographs stored on a video disc. The avionics system equipment is simulated by displaying these photographs on a high-resolution, color video monitor. The avionics video images are interchangeable providing test equipment training for any portion of the avionics system.

Device 11B108 reacts to trainee operation of relevant avionics controls by providing real-time, interactive responses. These responses are a reproduction of normal avionics system sequences, which are provided by the trainer equipment software model and depicted in the system operation and maintenance manuals as status lamp conditions, voltages, frequency characteristics, and digital displays. The trainer provides instructional messages when trainee performance errors are committed. Distractors are provided to allow the trainee to make, recognize, and correct procedural errors.

This maintenance trainer concept is one in which trainee maintenance personnel receive practical experience in fault isolation, alignment, identification, and removal of assemblies through the use of the simulated test equipment. To accomplish their training, maintenance personnel perform maintenance procedures using the associated maintenance documentation, make and record their observations, and document their conclusions. The realistic simulation of actual test equipment responses provokes an appropriate student action in response to procedural information in the maintenance documentation.

The design approach for device 11B108 lends itself to two design features which enhance the learning environment. First, because the test equipment is simulated through software instead of stimulated, test points do not in any case have real world signals on them. Voltages on test points and test probes are of logic levels (0 volts and 5 volts) and present no hazard to test equipment or trainee. Second, electroluminescent (EL) lighting is used to illuminate the front panel of the simulated test equipment. EL lighting is a 115V, 400HZ light strip mounted on the leading edge of the doors which cover the simulated test equipment. When the door is in the stowed position, the door switch provides a path for power to illuminate the strip and subsequently the test equipment.

#### PHYSICAL INFORMATION:

Number of pieces: Three major, two minor  
(laser printer and power distribution)

#### Sizes:

Instructor station	-48" h x 66" d x 157" w
Student station	-75" h x 48" d x 120" w
Peripheral Controller	-75" h x 30" d x 23" w
Laser printer	-36" h x 26" d x 21" w
Power distribution	-76" h x 34" d x 37" w

#### Weight:

Instructor station	- 700 pounds
Student station (15)	-1330 pounds
Peripheral Controller	- 410 pounds
Laser printer	- 290 pounds
Power distribution	-1450 pounds
Total system (including cables)	- 22,825 pounds

#### EQUIPMENT REQUIRED (NOT SUPPLIED):

None.

#### POWER REQUIREMENTS:

Input Requirements: 115VAC, 60Hz. 1-Phase  
Maximum Peak Power: 57.7KVA  
Maximum Starting Power: 47.6KVA & 414  
Amperes/Phase

#### PUBLICATIONS FURNISHED:

Instructor Utilization Handbook, AFTA Maintenance Trainer, Device 11B108, NTSC P-5298 (U).

Operation and Maintenance Instructions, AFTA Maintenance Trainer, Device 11B108, NTSC P-5296 (U).

Commercial Computer Documentation Set, AFTA Maintenance Trainer, Device 11B108, NTSC P-5297 (U).

Simulation Equipment Operation Handbook and Support Software User's Guide, AFTA Maintenance Trainer, Device 11B108, NTSC P-5730 (U).

Computer and Peripheral Maintenance, Technical Hands-On Training System Packets, AFTA Maintenance Trainer, Device 11B108, NTSC P-5731 (U).

Device Maintenance, Technical Hands-On Training System Packets, AFTA Maintenance Trainer, Device 11B108, NTSC P-5732 (U).

#### PERSONNEL

Instructor: Qualified electronic technicians, either Navy or Marine enlisted in grade E-5 or above.

Operator: Instructor-operated.

Trainees: Class of up to 30.

#### CONTRACT IDENTIFICATION:

Manufactured by AAI Corporation, Maitland, Florida, under NAVTRASYSCEN Contract N61339-85-C-0066.

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