
Technical Specifications

For The Supply and Installation of

Common Use Terminal Equipment (CUTE)

AEROPUERTO INTERNACIONAL

JUAN SANTAMARIA

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INTRODUCTION

Common Use Terminal Equipment (CUTE) will provide AEROPUERTO INTERNACIONAL JUAN SANTAMARIA (AIJS) the ability and flexibility to respond to the demands of our customers and the increasing traffic of the region. CUTE System users will include Airport Management and Airline Operations Personnel.

A new terminal building is currently under construction and it is anticipated that it will be occupied in mid December 1999 or by February 2000. CUTE will become operational at this time.

AIJS desires to provide CUTE to achieve the goals of sharing and maximising constrained facilities. The initial CUTE installation will include 57 ticket counter positions. A Phase 2 expansion is anticipated approximately 15 months later and will increase the number of ticket counter positions to 90.

The CUTE system will provide a common hardware interface for designated ticketing and gate counters and will allow multiple airlines to time-share counter positions by emulating each airline's host computer system. To the airline agent the CUTE workstation screen and keyboard interface will be no different than a direct host connection.

1 SYSTEM DESIGN

Software development and systems integration design shall, to the greatest extent possible, use off-the-shelf systems (software and hardware components) and shall embrace systems and technologies that have been developed and successfully implemented. The system shall provide AIJS future flexibility by providing complete software documentation of interfaces and protocols, providing AIJS Vendor independent interfacing, and allowing for future system expansions.

2 BIDDER QUALIFICATIONS

Bidders must meet the following requirements to be eligible for bid submission.

- Common use system must permit airlines to use their application of choice. In other words, airlines must not be limited to use of vendor supplied proprietary applications.
- Currently support a minimum of one operational common use site based on a Windows. NT operating environment.
- Be prepared to demonstrate an NT common use platform.
- Eligible vendor must operate a minimum of 5 sites in the United States with 5 or more scheduled airline users at each site.
- Demonstrate the ability to execute windows, DOS, Windows NT and OS./2 applications on the same workstation without re-configuration.

3 EQUIPMENT AND SERVICES FURNISHED BY AIJS

AIJS will perform the following services and provide "Shell" space at the Basement Level by way of a Core Room. This room is located below the Grand Lobby Ticket Counters in the new Terminal Building. Electrical power will be provided near this room. Cable raceways will be provided including for the CUTE System including UTP Category 5 cabling from the ticket counters to the Core Room.

4 EQUIPMENT AND SERVICES FURNISHED BY VENDOR

The Vendor shall provide inserts for all printers installed in counters. The Vendor shall ensure ventilation requirements are met for the hardware.

The Vendor shall perform all work, systems integration, engineering design, and testing, and shall provide all products required in order to ensure fully operative systems and proper installation of equipment. System operability and proper installation shall be verified via completion of the acceptance test plan (see Section 12.4.1). The Vendor shall perform the following services and provide the following equipment and documentation:

- A. Hardware as specified for the CUTE system and hardware which is specific to the Vendor solution (e.g., Airline Communication Cards).
- B. Final connection of hardware to power, phone, data circuits, and cabling infrastructure (patch cords connecting the CUTE system equipment to the data outlets and/or AIJS LAN equipment). The Vendor shall provide all patch cabling, connectors, adapters, and terminating equipment necessary to interconnect all system equipment.
- C. CUTE software, any other software which may be required to make the system fully operational as specified.
- D. Design work for the CUTE system such that the implemented system meets the functional, operational, and performance requirements specified herein.
- E. Installation and setup of the CUTE system (hardware and software).
- F. Hardware, software, and contract submittals as specified.
- G. Network requirements (provide, test, and certify all connect cabling).
- H. System warranty as specified.

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- I. Training as specified.
- J. System acceptance test plan and testing as specified.
- K. Maintenance and support as specified.
- L. Coordination of airline host system cabling terminations in the core computer room (where required)
- M. All calculations and/or analysis to support design and engineering decisions as specified in Submittals.
- N. Provide and pay for all labor, materials, and equipment. Pay required sales, gross receipts, and other taxes.
- O. Give required notices to Owner and Program Manager.

5 REPLACEMENT PARTS

The Vendor shall provide at the outset of the System Operation Test, all spare components. There shall be provided by the Vendor a minimum of 5% spare parts for all active system components. Spares shall be furnished for at the indicated recommended spares percentages:

- CUTE workstation - 5%
- Automatic Ticket & Boarding Pass printer - 8%
- Baggage Tag Printer - 8%

Based upon the warranty period experience, the Vendor shall recommend, at the end of the warranty period, any changes in small part stores that prove to be appropriate.

6 GENERAL SYSTEM REQUIREMENTS

The following features and functions are required as part of the CUTE system implementation:

1. Windows NT operating environment for the client as default
2. Interoperability
3. Industry standard (ANSI X3.135-1992 compliant) databases, SQL, and ODBC
4. Integration processes
5. Vendor Neutrality
6. Year 2000 Compliance

The airlines will be replacing their back office equipment and Host computers upon relocation to the new terminal.

Vendor is required to allow AIJS to own, maintain, AIJS and operate the installed system and is required to provide documentation.

6.1 GENERAL OPERATING REQUIREMENTS

6.1.1 Common Use Terminal Equipment (CUTE)

The CUTE system shall allow check-in and gate hardware at specified locations to be used by multiple airlines. The CUTE system shall emulate each airline's host system. At the CUTE workstation, the screen and keyboard interface shall be no different than a direct host connection. The CUTE connection to the host shall ensure that any applications that are available on the host system will be accessible through the CUTE. Workstations shall be connected via the communications infrastructure to the core computer room. The equipment in this room shall provide gateways to the host systems via Remote Access Servers (RAS). Each workstation shall have various common use hardware connected to it depending on the location. The Automatic Ticket and Boarding Pass Printers (ATB) and the Bag Tag Printers (BTP) shall use common stock; however, each airline shall be able to load their stock when utilizing a position.

6.1.2 Local Departure Control System. Propose as an Option

The Vendor's proposal shall include, as an option, for the provision of the required hardware/server(s) and software for a Local Departure Control System.

The Vendor shall provide the integration services to allow the airlines working on the CUTE system to access the LDCS, and to allow the LDCS to be connected to the host system as long as the Host is operative (back-up function), per the airlines functional requirements.

The Vendor shall provide the integration services to allow non-hosted airlines to receive PNL as described below, and use the system for Check-in and Boarding facilities. The system shall provide as a minimum:

- A common check-in user interface
- The ability to issue sequenced baggage tag numbers and boarding passes
- Local boarding application and passenger reconciliation
- Passenger baggage matching
- Aircraft operations information
- Single/multi sector
- Single/multi class
- Ability to handle charter and domestic flights
- On demand bag tags and boarding pass printing tag number recording required
- Support importing PNL from a diskette (fixed format), electronically downloading PNL, and manual input of PNL to authorise at least 3 classes of users based upon functionality granted
- Provide split seating of groups
- Ability to handle standby passengers
- Number of bags
- Manual seating, free seating, pre booked seating and charter seating logic shall be provided
- Seating preferences: Smoking/No, Window/Aisle

- Concurrent check-in from multiple check-in and other locations.
- Special requirements (meal selection etc.)

The LDCS software shall provide as a minimum:

- A central database, Industry standard (ANSI X3.135-1992 compliant) databases, SQL, and ODBC
- to process and store data.
- Files formatted for IATA standards. Provide separate files for each airline, to include but not be limited to:
 - Boarded Passengers
 - Passenger Check-in Inhibitors
 - Bag Tag Numbers
 - Flight Schedule Information
 - Baggage Weights and Counts
 - Seat Allocation by Aircraft Type
- A high level file which controls the access of users to files. The file shall contain, as a minimum the user's access level (whether site administrator or airline agent), user's agent number, airline code. Use the access level and/or airline code to control access to files.

Data Base software to allow the users to have the following functions:

- The automatic software function of accepting log-on name, airlines, password information, from the security level operator interface (GUI) executing on the CUTE system.
- A GUI to allow the user to input specific information about each flight. This information shall be stored in the appropriate airline Data Base file holding daily/weekly flight information. This information shall be made visible through subsequent GUIs (i.e. to allow the user to see when standard time of departure (STD) for a flight is, when they check in a passenger).
- Each airline with the software/hardware required for loading Passenger Name Lists by data entry through a GUI or on-line downloading.

A GUI to allow user to enter data associated with check-in for the flight, including:

- Checked-in Passengers
- Passenger Off loading
- Seat Assignment:
 - Dynamic seatmap (kept up to date in real time with all passengers checked in)
 - Retrieval of passenger record by name or seat number
 - Baggage Check-in
 - Excess baggage charges (automatically calculated and reported by agent and flight.)

- Automatic calculation of baggage weight and count information to be used in the weights and balances calculations.
- Automatic generation of Baggage Source Message (BSM) and Baggage Unload Message in IATA format. The BSM/BUM shall then be communicated to the BRS and BHS via CUTE connectivity.
- A GUI to allow user to initiate the printing of bag tags through an addressable CUTE printer. Establish in the software function that airline information will be shared with the CUTE system to ensure that the correct tag printing format and PECTAB (airline logo) information is used. Give the user the ability to designate the printer to be used.
- A GUI to allow user to initiate the printing of boarding pass through an addressable CUTE printer. Establish in the software function that airline information will be shared with the CUTE system to ensure that the correct printing format and pectab (airline logo) is used. Give the user the ability to designate the printer to be used.
- For Boarding/Off loading by seat number, security number or selection from list.
- A GUI to initiate the flight close-out process. Include as part of the close-out functions, but do not limit to, the final weights and balances calculations.
- As part of the flight close-out process the capacity to print out flight reports.
- GUI menus for each of the Departures Control System functions.
- In the future it may be necessary to modify pre-defined GUIs as well as define new GUIs. Establish the requirements for all GUIs with airport personnel.
- A GUI to provide clearly defined menus which provide any user with simplified method of entering data and accomplishing functions including:
 - Headings for data groups
 - meaningful titles for each data field to be entered
 - Default values and/or listings of options for each data field
 - Easy cursor movement from field to field by use of the TAB key Pull-down menu or listings which are hot-key activated, not pointer activated
 - Aircraft seating layouts for Seat Assignment functions
- Security provisions to limit access to files. Establish software security which allows site administrative level personnel to have access to all portions of the software, and airline agent level personnel to have access to only selected files of the airline.
- Set-up configuration data for two airlines and test data to simulate one airline with one aircraft.

- Maintenance of Configuration Data and Operations Data: Subsequent to Final Acceptance, maintenance of configuration data and operations data shall be the responsibility of the Site Administrator. The operations data shall include, but not be limited to, any and all required aircraft configurations for user airlines.

6.1.3 System Requirements

The CUTE shall meet the following requirements:

- A. The systems shall adhere to a Client / Server model.
- B. All operating systems shall meet the following criteria:
Windows NT operating environment
Support Symmetric Multi-Processing (SMP) and the TCP/IP network protocol.
Latest version of the operating system at time of initiation of systems testing.
- C. Network communications shall permit use of multi-protocol stack including TCP/IP network communications protocol.
- D. Workstation IP addressing shall be coordinated with AIJS.
- E. Workstations shall be mutually independent of each other (e.g., two CUTE workstations at the same gate counter can access two different hosts simultaneously).
- F. Workstations shall be able to spool output to a peripheral device which is physically connected to another workstation.
- G. Vendors shall support each airline's host / terminal emulator.
- H. The systems shall facilitate integration of other applications.
- I. Common control hardware and software shall be provided to control the individual workstations, provide connections to the respective host computer systems, and to assure availability.
- J. Sufficient resiliency / redundancy and logic shall be provided to assure that the availability objectives (refer to Section 6.1.4) can be met without manual intervention on the part of the Airport or airline staff .
- K. The systems shall use industry standard components. The systems shall not contain any proprietary interfaces or components and all components shall be truly common use (e.g., If AIJS desires to change Vendor or add an airline, there shall be no need to replace any equipment).
- L. System components shall be independent and capable of coexisting on the system to allow for an increased level of capacity. Modular design and flexibility shall be provided for easy expansion of the system without degradation to the system's performance.
- M. All major system hardware components shall be designed so that there is not any single point of failure, which can cause operations to be disrupted. For example, the system shall employ redundant servers. In the event that a primary server fails, the backup server shall take over the processing tasks. An automated diagnostics capability shall be an integral part of the system which serves to autonomously detect, identify, and correct failures in the system. Additionally, upon such failure, the system administrator shall receive an automated alert dispatch warning to notify him of the partial failure. A system console message and an error log will be part of this automated process. This shall include all system servers, major network

- components, power supplies, and uninterruptible power supplies (UPS's). A capability shall exist to permit remote access to the system.
- N. Access to the CUTE terminal should also provide access to local voice communications. The design should build telephone communications into the CUTE console via a physical mechanism i.e. a drawer within the console in which the telephone can be locked when the counter is unoccupied.
 - O. The data base software and programming techniques used should be consistent between the CUTE system and the Local Departure Control System.
 - P. All equipment must be UL approved.

6.1.4 Performance Requirements

6.1.4.1 System Availability

All software and network devices shall execute, without degradation, at the scheduled periods and response times for the CUTE system to be considered available.

6.1.4.2 Hardware Availability

All systems shall operate as specified twenty-four (24) hours per day, seven (7) days per week. Hardware availability requirements are as follows:

A CUTE workstation shall be considered available only if all components are operating and fully functional.

A peripheral device shall be considered unavailable if it cannot be placed on-line and perform its intended function(s).

6.1.4.3 Downtime

The Vendor shall clearly state in his proposal the monthly downtime of all systems. Downtime to update the computer operating system or repair a component shall be acceptable reasons for downtime, but at no time shall an entire system be non-operational. Availability of any individual workstation shall be at least 99.8 percent. The entire system shall have an availability of 99.9 percent.

6.1.4.4 Response Time

The following criteria for system response shall be met:

- The additional delay for a transaction between a CUTE workstation to a given host and return compared to a dedicated terminal shall not exceed 0.5 seconds total for ninety (90) percent of all transactions

- Vendor shall state the time required to download a Parametric Table (PECTAB) to each piece of peripheral equipment. Differentiate between a "standard" format containing text only, and text combined with a graphic such as an airline logo

6.2 NETWORK

The primary and backup servers for the CUTE system shall be located in the Core Computer Room. The end users shall communicate with the CUTE system applications utilizing the TCP/IP, IEEE 802.3 Ethernet network protocols. The Vendor shall provide the cabling infrastructure from the Core Computer Room to the CUTE workstations to provide services to workstations and all end users.

The systems shall be capable of Simple Network Management Protocol (SNMP) managed with Remote Monitoring (RMON) capabilities. It is understood that the internal proprietary code of the Vendor may be monitored by a specialized program and not by SNMP. However, this must be approved by AIJS.

6.3 USER INTERFACE

The Vendor's user interface shall be easy to use as described below:

The CUTE system's front end shall also have a GUI.

The CUTE system's front end shall consist of the following:

- When a CUTE workstation is powered on and no session is in progress, an approved logo or screen saver shall appear on the screen.
- A graphical icon for each airline or agency shall be provided for login. Once an icon is selected, airline/agency specific login and password shall be required to continue
- Once each employee has logged in, a set of icons for the various applications available (e.g., host connection, EVIDS - read only) shall be displayed. The icons available shall be dependent on the user's login profile.
- The user interface shall require minimal additional training for the users.
- The system's displays and controls for accessing them shall be self-explanatory.
- The systems shall support both a pointing device and keyboard interface.
- All pointing device actions shall have a "hot key" equivalent, i.e. all functions should be able to be performed using the keyboard exclusively, without a mouse.
- The systems shall have the capability to support context sensitive, on-line help capabilities.
- The software shall support a Magnetic Stripe Reader (MSR) interface for login purposes and additionally support MSR capability on an airline by airline basis.
- The software shall support a Passport Reader.

The Vendor' system shall support the following airline host computers during initial phases: (Example)

Airline	Host Computer System
Air Transat	SABRE
American Airlines	SABRE
Avianca	
Canada 300	
Eastwind	
Air Canada	RES 3
Continental Airlines	
COPA	
Cubana	
Delta Airlines	
Grupo TACA/LACSA	
Iberia	
Mexicana	
United Airlines	
American International Airways	

6.4 SOFTWARE - GENERAL

All required system and application software for a fully functioning system shall be delivered by the Vendor. Each shall be identified by the generic, off the shelf name. The software provided by the Vendor to operate the system shall be delivered in a ready-to-run form, including all necessary utility programs and documentation. The documentation shall include textual explanations and instructions and be supported by appropriate graphs, flowcharts and/or block diagrams. Adequacy of the flowcharts and the block diagrams shall be at the discretion of AIJS's representative.

To the greatest extent possible, Commercial Off-The-Shelf (COTS) software packages shall be utilized. Custom software shall be limited to hardware drivers with documentation provided in full detail. Application software shall be written in a fourth generation language supplied with the DBMS or a third generation, high level compiled language, "C," "C++," "JAVA" or equivalent. Any assembly language or ROM code embedded in peripherals shall be totally independent modules with required interfaces' documentation required for making modifications shall be provided in detail.

All dates used within the system must include the century digits (i.e. Year 2000 compliant) as part of the year, e.g., "1998" rather than "98." The system must be capable of correctly processing during the transition from day light savings time and standard time, and vice versa. The system must be capable of correctly processing during the transition of centuries in the year 2000. The system must be capable of correctly processing at the beginning of March during leap years (i.e. when there is a February 29th).

The CUTE system shall not require changes to the host computer applications software.

The ability to configure the systems with an automatic logout after a system definable period of inactivity shall be provided.

6.4.1 Software - CUTE

The CUTE system shall meet these specific requirements:

- A. The CUTE system shall comply with the latest revision of IATA RP 1797.
- B. The system shall provide access to the specified airline host computer system applications. From any CUTE workstation any authorized user shall be able to access host applications. Typical host applications which the system shall have the capability of supporting via terminal emulation are (but are not limited to):
 - Departure Control
 - Reservations
 - Ticketing
 - Local Boarding Application
 - Baggage Tracing
 - Flight Operations Control
 - Message Switching
 - Information Systems such as EVIDS
 - Aircraft Maintenance Systems
 - Cargo Systems
 - Baggage Reconciliation System
 - E-mail.
 - Electronic Ticketing
- C. From any CUTE workstation any authorized user shall be able to access AIJS's applications. The CUTE system will be compatible and be integrated with the following AIJS's applications:
 - Gate Control System
 - Flight Information Display System

The CUTE software must have the capability to integrate with the Airport's Gate Scheduling and the Airport's EVIDS Software so that there are no scheduling conflicts for ticket counters, gates or gate counters.
- D. Windows NT operating system is the required operating system for the CUTE system. The system shall allow applications to be run simultaneously under the CUTE software including applications for DOS, Windows 3.x /95/NT, OS/2, and UNIX. The software shall allow for multiple (minimum of three) simultaneous sessions to be open to the same or different hosts and/or to other AIJS applications from the same workstation.
- E. Any CUTE workstation shall be able to access any airline host system. Any communications equipment (e.g., gateways, modems, ALC cards, routers) required to interface with each host shall be provided by the Vendor.
- F. Software shall allow for boarding pass printers to support direct thermal magnetic stock.

6.5 SYSTEM ADMINISTRATION

For route control and status of the host computer and connected network, the CUTE common controls shall be able to determine if a path is available in and out of the local environment and advise a workstation user when the workstation is connected to the respective host. For route control and status of the common controls, status information shall be provided to the user but the design of the system shall be such that an alternate path should normally be available through the local network. Recovery of path shall be an automatic function of the common controls when possible.

The common controls shall, as appropriate to the connected user host system, notify the host when there is a change in the status of a workstation component during a session.

All failures of the system shall be logged at a central control point (i.e., CUTE Application Server). The failure shall initiate alarms and reports (e.g., time and date of failure event). In the event that a workstation component goes out of service, the central control log shall be updated. Therefore, where practical, a positive relationship (e.g., system heart beat) shall exist between all components of the systems at all times (refer to IATA RP 1797).

6.6 HARDWARE

All hardware requirements given are the minimum requirements. The Vendor's product shall meet or exceed these requirements. Additionally, the hardware selected shall meet the operational, functional, and performance requirements specified herein. Where a specific product is mentioned, it is only listed to provide clarification. The Vendor may bid an approved, equivalent device.

Equipment rack(s) for computer room shall be standard 19-inch racks within an office style enclosure providing adequate cooling with an ambient room temperature of 85 degrees F. The Vendor shall provide the appropriate factory or custom rack mount adapters and wire management accessories for all equipment installed in the equipment rack, whether specifically itemized or not. Vendor shall cover unused slots using blank panels. For hardware outside the core computer room, the Vendor shall provide fans as necessary to maintain equipment within the operating range of 50 - 85 °F.

Where possible, the servers and workstations shall utilize the same hardware platform.

6.6.1 Servers

Servers shall be rack mounted in a server cabinet approved by AIJS. Server pairs (i.e., CUTE File Servers) shall consist of a primary and a backup. Server pairs shall be fault tolerant via clustering, mirroring, or other technology as applies to the server vendor. Each shall be continuously updated and the backup shall automatically assume control in the event of a failure of the primary. Server hardware platforms shall be scaleable via simple upgrades to support AIJS future CUTE requirements at AIJS. Servers shall be oversized

as necessary to meet future needs of A (i.e. CUTE installed at every gate, ticket counter, and loading bridge). Servers shall include appropriate UPS. The servers provided by the Vendor shall meet the applicable server requirements below:

6.6.2 Gateway servers shall meet the following requirements as a minimum:

400 MHz Pentium processor (s)
256 Mb RAM
High speed graphics card
High speed Network Interface Card
Redundant power supplies
15-inch color monitor
Standard keyboard and mouse.
Appropriate Battery/UPS backup unit

6.6.3 Applications servers shall meet the following requirements as a minimum:

400 MHz Pentium processor (s)
256 Mb RAM
High speed graphics card
High speed Network Interface Card
Server pair - primary and backup server
Redundant power supplies
15-inch color monitor
Standard keyboard and mouse.
Appropriate Battery/UPS backup unit

6.6.4 File servers shall meet the following requirements as a minimum:

400 MHz Pentium processor (s)
256 Mb RAM
High speed graphics card
RAID Level 5 hard disk array
High speed SCSI adapter
High speed Network Interface Card
Server pair - primary and backup server
Redundant power supplies
15-inch color monitor
Standard keyboard and mouse.
Appropriate Battery/UPS backup unit

6.6.5 Database servers shall meet the following requirements as a minimum:

400 MHz Pentium processor (s)
256 Mb RAM

High speed graphics card
RAID Level 5 hard disk array
High speed SCSI adapter
Data backup tape drive
High speed Network Interface Card
Server pair - primary and backup
Redundant power supplies
15-inch color monitor
Standard keyboard and mouse.
Appropriate Battery/UPS backup unit

6.7 WORKSTATIONS

CUTE workstations (CUTE WS) shall meet the following requirements as a minimum:

400 MHz Pentium processor (s)
64 Mb RAM
High speed Network Interface Card
4 serial ports and 1 parallel port
Color monitor
Desktop keyboard with built-in pointing device and MSR.
Appropriate Battery/UPS backup unit
Passport Reader

6.7.1 Peripherals

The CUTE devices shall be compliant with AEA 94 or newer AEA releases. All peripheral devices shall be supplied with the necessary interface cabling.

6.7.2 Monitor

Monitors will be sized as specified for CUTE workstations (i.e., 15-inch). See design of the Ticket Counters to ensure monitor fit. Server monitor sizes shall meet or exceed the minimum server requirements (i.e., at least 15 inches). Monitors shall meet the following minimum requirements:

0.25 mm dot pitch
Non-interlaced at 1024 x 768 (75 Hz)
SVGA
Anti-glare screens

6.7.3 Keyboards

Server keyboards shall be industry standard 101 -key that adhere to IATA recommended standards. Workstation keyboards shall be provided which are able to meet the demands of an airport environment (e.g., heavy usage). The workstation keyboards shall be configured to support the input requirements of the various

airlines. The workstation keyboard provided shall be industry standard keyboard with built-in Magnetic Stripe Reader (MSR) and pointing device or equivalent approved by AIJS. The MSR shall be capable of reading ATB1 and ATB2 Tickets, frequent flyer cards, and credit cards. The built-in pointing device shall be used to support the use of software with a Graphic User Interface (GUI). All required firmware and software shall be provided and installed.

6.7.4 ATB

The CUTE system shall use industry standard Automatic Ticket and Boarding pass printer (ATB) (must be dual feed) that adheres to IATA recommended standards. The ATB shall conform to the IATA resolutions relating to ATB's (IATA 1722c, 722c, 722d, 722e) and to the 1994 AEA specification for PECTAB's. The printers shall be set up for direct thermal printing only. All required firmware shall be provided and installed.

6.7.5 BTP

The CUTE system shall use industry standard Bag Tag Printer (BTP) that adheres to IATA recommended standards. The BTP shall conform to IATA 740 and 740a and shall be compatible with the 1998 AEA specification for PECTAB's. The printers shall be set up for direct thermal printing only. The printers shall not include a cutter or burster. All required firmware shall be provided and installed.

6.7.6 Laser Printer

The CUTE system shall use the HP LaserJet 6P with 4 MB of RAM. All necessary interface cabling shall be provided.

6.7.7 Hardware Security

There shall be a mechanism to lock the workstation from use in order to provide security for public area terminals. CUTE workstations shall require two logins. The first is an airline specific login, which provides access to the CUTE system for that airline. The second login is agent specific. The login procedure shall also incorporate telephone access. Additionally a mechanism shall be provided to lock down the CUTE workstation's monitor and keyboard via a lock-pad device. The telephone will also be in a locked compartment within the CUTE console.

6.7.8 Expansion and Spare Capacity

The system implemented shall be designed such that an increase in system size (e.g., adding additional CUTE workstations) will not adversely affect the system or require design modifications. Each system shall be designed such that adding additional airlines, gates, and workstations shall not have a negative impact on the systems. For example, adding an airline to the CUTE system shall have no impact on the overall system design.

Vendor shall clearly state the limitations of the expansion of the base system proposed in terms of additional CUTE workstations, peripherals, and airlines. Particular attention should be given to the number of additional CUTE workstations before additional processing power, memory, and/or disk storage would be required.

At the time of final system acceptance, all hardware shall have a minimum of 50 percent reserve capacity, with the capability to double the capacity with no change to the system design. Hard disk, CD ROM's, and tape unit capacities shall be based on formatted capacity. System reserve capacity shall be based on the maximum continual working load.

6.7.9 Hardware Counts

The following sections only provide general guidelines for hardware counts. For exact hardware count refer to Table 1 . The CUTE system hardware counts are based on the Phasing and the following guidelines:

6.7.10 Ticket/Recheck Counter

Ticket/recheck counters shall be two position counters. The typical CUTE system hardware complement of a ticket/recheck counter position shall be:

Two (2) CUTE WS with 15-inch monitor
One (1) ATB
One (1) BTP.

6.7.11 Gate Counters

Gate counters shall be two-position counters. hardware complement of a gate counter shall be: The typical CUTE system

Two (2) CUTE WS with 15-inch monitor
One (1) ATB
One (1) Laser Printer

6.7.12 Core Room

This room shall serve as the primary and backup core equipment room.

7.0 Not used.

8 ENVIRONMENTAL - POWER, ETC.

Equipment shall operate in a normal office environment with standard AC voltage at sixty (60) Hz.

9 DRAWING AND DOCUMENTATION

The Vendor shall supply sufficient documentation and drawings to allow AIJS to maintain and operate the CUTE system. Four (4) hard copies and one (1) electronic copy of all drawings shall be provided (AutoCAD Version 12.0 or higher). Four (4) hard copies and one (1) electronic copy using WordPerfect of all documentation shall be provided AIJS.

The Vendor's Quality Assurance organization is responsible for assuring that the "as installed" and "as tested" system is correctly and completely documented in such a manner as to support maintenance and future expansion of the system by AIJS. Thus the Vendor's quality assurance extends through Vendor's documentation including engineering drawings, manuals, test procedures and operational procedures.

9.1 MINIMUM DOCUMENTATION

At a minimum, the following drawings and documentation shall be provided:

Software and hardware user documentation

System administrator documentation - configuration management

System manuals

System and component configuration documents

9.2 HARDWARE MANUALS

Provide four (4) copies of manufacturers' hardware manuals for all hardware included in this project. These shall be in both the Spanish and English languages.

10 TRAINING

10.1 BASE SERVICES - USER PERSONNEL TRAINING

The following general training guidelines shall be followed:

By means of training classes augmented by individual instruction as necessary, the Vendor shall fully instruct AIJS's designated staff and Airline Operations' personnel in the operation, adjustment and routine maintenance of all products, equipment and systems. The Vendor shall provide all training aids, e.g., notebooks, manuals. The Vendor shall provide an appropriate training room within a three (3) mile radius of the Airport at the Vendor's own expense.

The Vendor shall provide a minimum of twenty-four (24) hours of user training, two-hour classes repeated 12 times - 12 airlines, six students per airline.

All training shall be completed two weeks prior to system cut over.

Training shall be conducted by experienced personnel and supported by training aids. The Vendor shall provide an adequate amount of training material. At a minimum, the Vendor shall include all procedure manuals, specification manuals, and operating manuals.

Participants shall receive individual copies of manuals and pertinent documentation at the time the course is conducted. The courses shall be scheduled such that AIJS personnel can participate in all courses (i.e., no overlap).

A final course schedule and syllabus shall be prepared by the Vendor for each course to be conducted for AIJS personnel, and submitted for review at least four (4) weeks prior to the scheduled date of the course commencement.

Each course outline shall include, in addition to the subject matter, a short review of the prerequisite subjects (where appropriate); how this course fits into the overall training program; the objective; the standards of evaluation; and any other topics that will enhance the training environment.

A videotape of at least one course shall be provided to AIJS, for the purposes of documentation and ongoing training services subsequent to the completion of the project.

The Vendor shall also provide on site follow up user personnel training during the following six months after installation

10.2 OTHER SERVICES – AIJS PERSONNEL TRAINING

AIJS shall also require the following training:

- A. By means of training classes augmented by individual instruction as necessary, the Vendor shall fully instruct 'AIJS's designated staff and Airline Operations' personnel in the operation, adjustment and maintenance of all products, equipment and systems. The Vendor shall provide all training aids, e.g., notebooks, manuals. Three types of training programs shall be held. The Vendor shall provide a minimum of:
 - 2 hours of user training, one class, six students.
 - 12 hours maintenance training, four hour classes repeated three times for ten (10) maintenance technicians.
 - 20 hours software training for five (5) system administrators.
- B. Training for ten maintenance technicians shall be provided on site, and shall include, but not be limited to, installation, operation, renovation, alteration, inspection, maintenance and service on each system and subsystem provided, so as to enable troubleshooting and repair to the component level.
- C. Training shall be conducted by experienced personnel and supported by training aids. The Vendor shall provide an adequate amount of training material. The following is considered a minimum.

- Functional flow charts, overall block diagrams, and descriptive material for all software;
 - Schematic drawings for each of the hardware components;
 - All procedure manuals, specification manuals, and operating manuals;
 - As-built drawings.
- D. Participants shall receive individual copies of manuals and pertinent documentation at the time the course is conducted. The courses shall be scheduled such that AIJS personnel can participate in all courses (i.e., no overlap).
- E. A final course schedule and syllabus shall be prepared by the Vendor for each course to be conducted for AIJS personnel, and submitted for review at least four (4) weeks prior to the scheduled date of the course commencement.
- F. Each course outline shall include, in addition to the subject matter, a short review of the prerequisite subjects (where appropriate); how this course fits into the overall training program; the objective; the standards of evaluation; and any other topics that will enhance the training environment.

10.3 COORDINATION OF TRAINING CLASS SCHEDULE

Scheduling of training classes shall be coordinated with AIJS Personnel to avoid conflicts and peak period personnel demands.

11 MAINTENANCE

General maintenance and support requirements: For the purpose of bidding, 1 year of comprehensive maintenance as outlined below, shall be included in the Vendor's fixed price bid. A long term maintenance agreement with the Vendor may be negotiated by AIJS during the Warranty period based on any or all of the below listed elements as well as generally accepted industry standards and pricing.

- A. All lead technicians performing installation and maintenance shall have a minimum of two (2) years experience on the proposed system and be manufacturer certified on all hardware/software applications. All maintenance technicians shall be provisioned to attend a one (1) week manufacturer training class each year. Pre-assigned backup technicians shall be available to back fill onsite technicians who are on vacation, in training or who are out sick.
- B. The Vendor shall provide twenty-four (24) hour/ seven (7) day a week telephone support as a minimum maintenance and support agreement.

Support for commercially purchased software, if not twenty-four (24) hour seven (7) day a week, shall be specifically identified and approved by AIJS. Additionally, the Vendor shall

specify a maximum amount of time to get the system up and operational in the event of a system failure. This time period shall be subject to AIJS approval.

- C. Hardware support shall be supplied by the Vendor directly or by a sub-vendor approved by AIJS. Support shall cover all equipment and systems referenced in this specification. All software support for systems designed for this proposal shall be provided by the Vendor designing the software.

11.1 LONG TERM HARDWARE AND SOFTWARE MAINTENANCE AGREEMENT

The Vendor must commit to maintain the CUTE System for ten (10) years after the one-year warranty period. Use of Vendor provided post warranty hardware maintenance will be at the discretion of AIJS.

11.2 FULL MAINTENANCE

Full maintenance services by the Vendor shall be a guaranteed maximum annual cost to AIJS. This includes maintenance service for all equipment and software, and includes, but is not limited to, spare parts, materials, labor, software, testing equipment, tools, etc. necessary to fully support the CUTE System.

11.3 ON-CALL MAINTENANCE

As an option, on-call maintenance services shall be provided from the Vendor, with payments based on time and materials. Under this option, AIJS will maintain the CUTE after the warranty period. The Vendor shall provide services as required. This option includes maintenance services for all equipment and software. Additionally, the Vendor must commit to response times. Maintenance prices shall be broken down by equipment, software, and type of service whenever applicable.

The Vendor shall list all parts and diagnostic equipment that AIJS should have on-site to maintain the equipment and the proposed price for each item for the CUTE. Manufacturer and model or part number must be listed for each spare part and each item of diagnostic equipment. The Vendor may list separately parts and diagnostic equipment items that are desirable to have on-site.

11.4 MAINTENANCE SERVICE

The maintenance services to be provided by the Vendor shall include preventive, routine, and emergency maintenance service.

Preventative maintenance services shall be provided in accordance with the provisions of a preventative maintenance manual that the Vendor issues for each component or subsystem of the CUTE. Preventative maintenance services shall include: inspection, test, necessary adjustment, lubrication, parts cleaning, and software upgrades.

Routine maintenance services shall include scheduled overhauls as recommended by the equipment and software manufacturer.

Emergency services shall include inspections and necessary tests to determine the causes of equipment or software malfunction or failure. Emergency services shall include the furnishing and installation of components, parts or software changes required to replace malfunctioning system elements.

Any AIJS supplied and/or pre-existing equipment component, e.g., PC ' workstations, printers, shall be excluded from the manufacturer's warranty and maintenance program.

11.5 RESPONSE TIME - CORRECTIVE/REPAIR SERVICES

AIJS has as its goal, zero downtime. All necessary steps shall be made to achieve the least amount of time during which a component is inoperable. The Vendor shall guarantee a response within twenty (20) minutes. Maintenance providers will be stationed on site to provide services at the following response times.

On site Critical Problems: 20 minutes

On site Non-Critical Problems: 90 minutes

Off site Critical Problems: 2 hours

Off site Non-Critical Problems: Next Day

On Site Hours:

0500 to 2300 hours daily, 7 days/week

Guaranteed response time is dependent upon the critical nature of the malfunctioning component. The Vendor shall provide a response escalation plan which defines level of severity (e.g., critical, routine) and the associated response time. The response escalation plan will be negotiated with AIJS.

Services to remedy malfunctions shall be started within no more than two hours following the Vendor's receipt of a malfunction notice from AIJS. Repairs are to be made as expeditiously as possible. If parts are immediately unavailable, the fastest means of shipment shall be used, including overnight expedited shipping. Downtime is critical and must be kept to a minimum.

11.6 MAINTENANCE LOG

The Vendor shall maintain a bound Maintenance Log book of all preventative maintenance and corrective/repair services performed during the warranty period. The Log shall be in an AIJS approved format. The Log shall be available for inspection by AIJS at any time during the year that it covers. The Maintenance Log book shall be turned over to AIJS at the end of the warranty year.

The Log shall be kept on a component-by-component (equipment number) basis, with separate sections or volumes, as appropriate, for each component. The Log shall itemize the history of preventative maintenance and corrective/repair activities, stating the character, duration, cause, cure of all malfunctions and the name of the individual(s) who completed the repair. The Log shall record all software and hardware updates.

11.7 SPARE COMPONENTS AND PARTS REPLACEMENT

The Vendor shall provide at the outset of the System Operation Test (SOT) whole unit spares. Secured storage will be provided on airport property by AIJS. Those whole unit spares shall be available to the Vendor for use during the equipment demonstration test and warranty periods. The Vendor shall replenish the store as it is used, so that at the end of the test and warranty periods, the store shall be equal to that to be provided at the outset of the SOT. All equipment and parts shall be new and UL approved and an itemized list of manufacturers' part numbers, model numbers, budgetary pricing, supplier's address, supplier's phone numbers and any single source components identified as such. The whole unit spares store shall be turned over to AIJS's designated representative (adequately trained with "hands-on" experience over the 12 month period) at the end of the Vendor's warranty period.

Based upon the maintenance experience of the warranty period, the Vendor shall recommend, at the end of the warranty period, any changes in spare component and small part stores that may prove to be appropriate.

11.8 SOFTWARE UPGRADES

All software upgrades shall be provided free of charge during the 12 months manufacturer's warranty period. Pricing for upgrades for subsequent years shall be provided with five (5) year fixed pricing as part of the maintenance contract.

11.9 SITE ADMINISTRATION

The Vendor shall provide on site administration in addition to hardware maintenance. For the purposes of bidding, one (1) year of Site Administration shall be included in the Vendor's fixed price bid. A long term Site Administration agreement with the Vendor may be negotiated by AIJS during this one-year period. The Vendor must commit to provide Site Administration for the CUTE system for at least three (3) years after this one (1) year period. Site Administration responsibilities shall consist of:

- Configuration Changes
- First level troubleshooting, determining source of problem, software, communications , hardware
- Responding to airport personnel as related to the CUTE system and related software
- Periodic training
- Implementation of periodic system upgrades for servers, clients and peripherals
- Monitoring system performance

- Performing database maintenance

Site Administration shall be provided Monday through Friday between the hours of 8am to 5pm.

The Site Administrator must possess a minimum of fifteen (15) of experience in the site administration of CUTE systems.

12 INSTALLATION AND IMPLEMENTATION SUPPORT

The following general requirements shall be met when implementing the systems:

- A. System installation and construction methods shall conform to the requirements of the Federal Communications Commission.
- B. Where undefined by codes and standards, Vendor shall apply a safety factor of at least 2 times the rated load to all fastenings and supports of system components.
- C. The Vendor shall install all system components including furnished equipment in accordance with the manufacturer's instructions, NFPA 70, ANSI-C2, National Electrical Code (NEC), South Florida Building Code where applicable and shall furnish all cables, connectors, terminators, interconnections, services, and adjustments required for a complete and operable system.
- D. Grounding shall be installed as necessary to preclude ground loops, noise, and surges from adversely affecting system operation.

For equipment mounted in drawers or on slides, provide the interconnecting cables with a service loop of not less than three feet and ensure that the cable is long enough to allow full extension of drawer or slide.

12.1 HARDWARE INSTALLATION

The hardware shall be installed following this criteria:

- A. Final hardware selected and installation of hardware shall be coordinated with the cabinetry millwork. Additionally, the Vendor shall review the millwork drawings to ensure ventilation requirements are met or recommend required modifications.
- B. The Vendor shall install and inspect all hardware required in this specification in accordance with the manufacturer's installation instructions. Final placement of hardware is subject to AIJS's approval.
- C. The Vendor shall be responsible for any and all loss or damage in the shipment and delivery of all material until transfer of title to AIJS.

- D. The Vendor shall obtain written permission from AIJS before proceeding with any work which requires cutting into or through any part of the building structures such as, but not limited to, girders, beams, concrete, carpeted or tiled floors, partitions or ceilings, or millwork. The Vendor shall obtain written permission from AIJS before cutting into or through any part of the building structures where fireproofing or moisture proofing could be impaired.
- E. The Vendor shall take all steps necessary to ensure that all public areas remain clear or are properly marked during installation or maintenance.
- F. The Vendor shall coordinate installation with AIJS, to minimize disruption of existing business functions at the airport.
- G. The Vendor shall place materials only in those locations that have been previously approved. Any other locations shall be approved by AIJS.
- H. The Vendor shall provide all CPU equipment installations with Battery/ups backup units.

12.2 WARRANTY

- A. Vendor shall submit a written guarantee for the system, against defects in workmanship and materials for one year after acceptance. During this period, the entire system shall be kept in proper operating condition at no additional labor or material cost to AIJS.
- B. All surplus parts and pieces to the installation shall be maintained as a spare parts inventory at AIJS. Parts replaced during the warranty period shall have a warranty matching that of the original part from date of replacement.
- A. System.

12.3 ACCEPTABLE DISTRIBUTORS

Vendor shall procure all cabling and components through an approved product distributor.

12.4 ACCEPTABLE CONNECTORS

All Work Area Outlet Components, Wiring Closet Components, and Wiring Closet Support Components shall be subject to TIA/EIA compliance requirements.

12.5 DATA CABLES

100OHM, 25-PAIR, 24 AWG, Solid Copper conductors, TIA/EIA verified for Category 5 performance with plenum ring.

12.6 CABLE PULLING

- A. Cables shall be pulled in accordance with the manufacturer's recommended practices and in compliance with N.E.C. Planning and care shall be taken to prevent abuse and damage during the handling or installation phase. Specified minimum cable bend radius shall be met without deviation.
- B. Cable shall be protected from tension, compression, torsion, bending, squeezing and vibration. Cables shall not be pulled improperly or to exceed the manufacturer's tensile rating (25lbs)
- C. Vendor shall not leave coils or excess cable in ceilings or cable trays unless otherwise specified. The cabling within the wiring closets shall be routed and dressed neatly to their termination points such that not excess cable is present. Vendor shall leave sixteen (16) inches of slack outside of the wiring closet in the overhead cable tray or underneath the raised floor, whichever applicable. As cables are pulled into the Communications Rooms, bundle them in groups of twelve (12) with Velcro straps according to their terminating row position. Strap exposed cables for strain relief at the termination in the communications rooms.
- D. All strapping and lashing of cable within the Communications Rooms shall be made with Velcro type straps for easy access to cable bundles to facilitate future "adds and changes". All strapping and lashing of cable within the ceiling plenum areas shall be made with plenum rated products suitable for use within return air plenums.
- E. Vendor shall install the cable within the ceiling plenum areas as applicable. Cable runs shall logically follow the aisle ways and branch off to termination points Random scattering of cables shall not be allowed.
- F. All cable runs shall be dressed in neat flowing runs. Where cables are exposed or routed in cable trays, lash the cable with applicable cable at least every eight (8) feet. Install all cable parallel and perpendicular to surfaces or exposed structural members, and follow surface contours where possible. In no case shall it be permitted to randomly scatter the cables.
- G. Vendor shall provide and install, open top (J-Hook) cable supports throughout the length of open cable runs. Cable supports shall be placed no more than sixty (60) inches on center. Where large quantities of cables are bunched together (50 cables or more), special supports shall be designed and installed to carry the additional weight.
- H. Where more than one cable is being installed in the same raceway, pull cable simultaneously. Use pulling compound or lubricant if necessary, compound must not deteriorate conductor or insulation. Use pulling means, including fish tape, cable, rope and basket weave wire/cable grips that will not damage media or raceway.

- I. All conduit shall be reamed to eliminate sharp edges and terminated with an insulated bushing.
- J. Vendor shall clearly label all conduits at both ends designating the floor closet by number, which includes the sequential numbering of the conduit originating at that closet. Conduit length shall also be indicated on the label. Pull boxes shall be labeled on the exposed exterior.

12.7 WORKSTATION TERMINATION

- A. At the workstation termination point, cables shall be routed and dressed as to provide a service loop in case retermination is necessary. Leave twelve (12) inches of slack at the junction box. Provide strapping of data cable at entrance to wall cavity to provide stain relief of cable in relation to outlet termination.
- B. The Vendor shall adhere to the latest connectorization procedures as specified by the manufacturer.

12.8 LABELING

The Contractor shall develop and submit for approval a labelling system in accordance with EIA/TIA –606. As a minimum compliance, the labelling system shall clearly identify all components of the system: racks/rails, cable panels and outlets. The labelling system shall designate the cable's origin and destination and a unique identifier for the cable within the system. Racks and patch panels shall be labelled to identify their location within system infrastructure. All labelling shall be recorded on the as-builts and all test documents shall reflect the appropriate labelling scheme.

12.9 TESTING

- A. All cables and termination hardware shall be 100% tested for defects in installation and to verify cable performance under installed conditions. All conductors of each installed cable shall be certified useable by the Vendor prior to system acceptance. Any defect in the cable system installation including but not limited to cable, connectors, patch panels, and connector blocks shall be repaired or replaced in order to ensure 100% useable conductors in all cables installed.
- B. Perform end to end testing of all cabling and connections with specified equipment and certify as meeting industry criteria. Provide hard copy test results for each cable.

12.10 CLEANING

Upon completion of the installation, make all components free of any oil, grease, dust and debris

12.11 DOCUMENTATION

- A. Record as-built cabling information
- B. Bind recordings and as-built cabling information into a cable record book indexed by Communications Room for each reference. Submit two copies of each cable records book to AIJS for review prior to acceptance.

12.12 ACCEPTANCE

Review test results and inspect installation with AIJS and obtain concurrence. Concurrence does not waive the responsibility of the Vendor to correct deficiencies.

12.14 SOFTWARE INSTALLATION

The Vendor shall install all custom and packaged software in the development and production environments.

12.14.1 SYSTEM START-UP

The Vendor shall not apply power to the system until after:

- A. System and components have been installed and inspected in accordance with the manufacturer's installation instructions.
- B. A visual inspection of the system components has been conducted to ensure that defective equipment items have not been installed and that there are no loose connections.
- C. System wiring has been tested and verified as correctly connected as indicated.
- D. All system grounding and transient protection systems have been verified as properly installed and connected, as indicated.
- E. Power supplies to be connected to the system and equipment have been verified as the correct voltage, phasing, and frequency as indicated.
- F. Satisfaction of the above requirements shall not relieve the Vendor of responsibility for incorrect installations, defective equipment items, or collateral damage as a result of Vendor work or equipment.

12.14.2 TESTING

12.14.3 Test Plan

The Vendor shall provide four (4) copies of a test plan for each testing phase for the review and approval of AIJS's representative. The test plan shall detail the objectives of all tests. The tests shall clearly demonstrate that the system and its components fully comply with the requirements specified herein. The test plan shall define, at a minimum, participant responsibilities, test's documentation, test's duration and schedule, explicit requirements to demonstrate contractual compliance, and procedures for dealing with discrepancies and failures during the test. The test plan shall be provided at least thirty (30) days prior to the scheduled start of any testing.

12.14.4 Test Procedures

The Vendor shall provide test procedures to AIJS a minimum of thirty (30) days prior to start of formal testing. No test shall be started without an approved test procedure. AIJS shall require fifteen (15) days to review the test procedures. Where corrections are necessary, they shall be made and the test plan resubmitted to AIJS for approval. AIJS shall require an additional fifteen (15) day review time for any resubmittal.

The test procedures shall prove conformity to all specification requirements. Satisfactory completion of the test procedure is necessary as a condition of system acceptance. AIJS reserves the right to waive any or all portions of the tests by noting so in writing in the test procedure documentation. Waiver of a test portion shall be considered as acceptance of satisfactory test for that portion of the testing. The successful completion or waiver of testing does not in any way relieve the Vendor of obligations under the system warranty requirements or constitute final acceptance of the system.

The Vendor's Quality Assurance organization shall review all formal test procedures prepared by the Vendor and deliverable under the contract to assure the tests cover all requirements and that there is a conformity between the conducted test, the test results and specification requirements. Test procedures shall contain:

- Functional procedure (including use of any test equipment, if necessary);
- Test equipment (if used) is to be identified by manufacturer and model;
- Interconnection of test equipment (if used) and steps of operation shall be defined;
- Test records shall include test equipment serial number, calibration date and calibration certification of test equipment (if test equipment is used);
- Expected results required to comply with specifications;
- Traceability matrix referencing specification requirements with specific test procedures;
- Record of test results with witness initials or signature and date performed;

- Pass or fail evaluation with comments;

Documentation verification shall be part of the test. Where documentation is not in accordance with the installed system interconnections and operating procedures, the system shall not be considered accepted until the system and documentation correlate.

12.14.5 Minimum Testing Requirements

The following listing is an example of testing that is expected. This listing shall not be construed as being all inclusive of the minimum testing requirements. Note: all performance testing shall be performed under moderate, medium and extreme loading environments, e.g. 50%, 100% and 300% loading.

A	End-to-end communications for each device at the specified bit error rate
B	Workstations, terminal servers Test each component for proper hardware/firmware and operating system/communications software operation
C	All peripherals, e.g., printers' functionality;
D	Database functional storage/retrieval;
E	Workstation and System Administration user interfaces and Functions;
F	Supervisor functionality including central communication functions, Subsystems, work station graphics, and information reporting, Printing, and database management functions;
G	Integrated system level network management;
H	Interoperability of the telephone network, AIJS network, and Emulation interfacing of future systems;
I	Stability of the system (ability to operate without data or hardware Failures for a specified period of time.).

Testing shall be based on a Windows NT common use platform. The Vendor shall cooperate with and provide AIJS's representative(s) the opportunity(s) to participate in any or all performance of the CUTE tests.

12.14.6 Test Report

The Vendor shall prepare, for each test, a test report document that shall certify successful completion of that test. Four (4) copies of the test report shall be submitted to AIJS representative within seven (7) days following each test for review and acceptance. The test report shall contain, at a minimum:

- Specification section, paragraph, subparagraph, and item number of requirement being tested;
- Pass/Fail checkbox with tester and AIJS representative initials;

- Commentary on test results;
- A listing and discussion of all discrepancies between expected and actual results and of all failures encountered during the test and their resolution;
- Complete copy of test procedures and test data sheets with annotations showing dates, times, initials, and any other annotations entered during execution of the test.

12.14.7 Tests Resolution

Any discrepancies or problems discovered during these tests shall be corrected by the Vendor at no additional cost to AIJS. The problems identified in each phase shall be corrected and a portion or the entire system re-tested as determined by AIJS's representative, before any subsequent testing phase is performed.

12.14.8 Inspections by Quality Assurance Inspector

The Vendor's Quality Assurance Inspector shall conduct a visual inspection of all installations to verify that the installations are in accordance with AIJS's and manufacturer's specifications. Records of the inspections signed and dated by the Quality Assurance Inspector shall be provided to AIJS representative. AIJS representative shall be notified by the Vendor of any inspection(s) and AIJS representative may elect to participate in any inspection(s). The Vendor shall be responsible for incremental testing of the system during construction

12.14.9 Single Workstation Operation Tests (SWOT)

A Single Workstation Operation Tests (SWOT) shall be provided as part of the system acceptance as described below:

- A. These tests are to determine whether the CUTE functions and the hardware and software components are properly installed. The Vendor shall provide AIJS, thirty (30) days in advance of the first tests, a plan for single Workstation operation tests. The tests shall not begin until the plan is approved by AIJS representative. The plan shall be followed for all single Workstation tests.
- B. Single Workstation tests shall be made at the Airport for each counter. When a Workstation installation has been completed, the installed equipment shall be tested by the Vendor. AIJS's representative shall have the option to witness all tests. The tests shall determine adherence to the Contract Documents and to the Vendor's shop drawings and other documentation.
- C. The test procedures shall cover normal transaction processing; illegal access; termination; all types of transactions including exception processing. Testing of a Workstation shall be completed within twenty-four (24) hours of completion of a Workstation's installation.

- D. Vendor shall not activate any Workstation for service until its Single Workstation Operation Test (SWOT) has been successfully completed to the satisfaction of AIJS representative. Such satisfaction shall be acknowledged in writing.

12.14.9 System Operation Test (SOT)

A System Operation Test (SOT) shall be provided as part of the system acceptance as described below:

- A. Thirty (30) days prior to the anticipated completion of all SWOT's for the facility the Vendor shall submit to AIJS representative a plan for the SOT, testing the facility's equipment and software installation as a system, i.e., all CUTE functions and communication to the Server. AIJS representative and Vendor shall collectively select an "initial start-up date" for the SOT. The Initial SOT shall run for seven (7) consecutive days beginning at 12:01 A.M. and continuing until midnight on the seventh day. The Initial SOT at the facility shall be conducted as a stand-alone operation. The Initial SOT shall be performed when all SWOT's have been completed. The Initial SOT shall cover all procedures to be performed by Tenants, operations' personnel.
- B. An Initial SOT failure shall be cause to restart the Initial SOT after the failure cause has been isolated and resolved. The restart shall be for a seven (7) day period, commencing at 12:01 A.M. and continuing until midnight of the seventh (7th) day. The SOT shall be completed within 30 days after the initial start-up date.

12.14.10 Final System Operational Test

A Final System Operational Test shall proceed in a manner to maintain operational status of the CUTE system. The Final SOT shall be performed as follows:

- A. The Final SOT shall include the following test procedures:
- Workstation by Workstation operation tests;
 - A performance test of the complete CUTE system installation;
 - Production of reports;

Performance of a thirty (30) day System Operational Test (performance reliability test of the complete installation).

- B. Following successful completion of the Initial SOT, the Vendor shall notify AIJS representative that the system is in readiness for the Final SOT. The Final SOT shall demonstrate, over a

period of time of thirty (30) consecutive days, the successful performance of all aspects of the CUTE. Final SOT shall comprise operation of the equipment system under actual operational conditions, i.e., patron use, normal activity recording and reporting procedures.

- C. The Final SOT shall first begin on a date jointly selected by AIJS, and Vendor. The test shall continue until a continuous thirty (30) day period has elapsed during which all of the performance criteria stated below shall have been met. If, during any thirty (30) day period, the system fails to meet any one of the following specified performance criteria, the failure shall be corrected and the test shall begin, anew, on a day agreed upon by AIJS's representative and Vendor.
- D. The criteria for successful performance of the Final SOT shall be (refer to the System Availability section for calculation of availability percentages):
 - That no subsystem shall be operationally available for less than 97 percent of the time during the thirty (30) day test period;

That the average availability of all subsystems be no less than 99 percent during the thirty (30) day period;

That a component of a given type shall not fail more than two times during the thirty (30) day test period, and if it does, the component shall be replaced and the test restarted (e.g., out of say three components of one given type, if each component fails once during the test period, then that component type shall have had more than two failures);

If any individual component (e.g. a specific workstation identified by serial number) fails more than once during the thirty (30) day period, AIJS shall require replacement of the component upon the second failure.

- E. During the Final SOT, the continued functionality, functional repeatability, failure reporting, stability and availability of the system shall be demonstrated. Where a failure occurs that causes loss of data, instability of the system ("crash") and/or contamination of the transactional data and the data base, the Vendor shall immediately correct the problem. Testing shall continue until a thirty (30) day period of stable operation is achieved. Stability is defined as the proper functioning of fault tolerance with a failure having no impact on the continued system operation nor integrity of transactional data.
- F. The use of spare equipment components normally stocked on-site shall be allowed in order to make the subsystem operational.

12.14.11 Acknowledgment of Successful Completion of System Operation Test

The Final SOT shall not be deemed as being complete until AIJS representative has submitted a signed system acceptance. At that time the one-year warranty period commences.

12.14.12 System Availability

The Vendor shall submit a System Availability Test (SAT) plan for approval by AIJS. Following the successful completion of the Final System Operational Test (SOT) period, the system shall undergo a ninety (90) day SAT. The purpose of the SAT is to demonstrate that the system is capable of maintaining a ninety-nine percent (99.9%) availability. The Vendor shall submit, and AIJS representative shall approve, the plan for the SAT.

The SAT shall be conducted while the system is in full operation. The test may occur during the warranty period.

System availability and testing requirements of availability are as follows:

A. System availability shall be measured in terms of Subsystem hours. An example of the calculation of availability is as follows:

- Say there are twenty-five (25) Subsystems in this project which provide $(24 \times 25 =)$ 600 Subsystem hours per day;
- A 90 day test covers $(90 \times 600 =)$ 54,000 Subsystem hours, therefore the system must be available for $(54,000 \times 0.999 =)$ 53,946 Subsystem hours;
- Therefore $(54,000 - 53,946 =)$ 54 Subsystem hours out of service is the maximum allowed during a 90 day test. Note: That if there are 25 Subsystems and the system as a whole is inoperative for more than 2.16 hours, the system will have exceeded the allowable 54 Subsystem hours $(25 \times 2.16 = 54 \text{ Subsystem hours})$.

Actual numbers of Subsystems will be used for the calculation of availability and will be weighted according to the following values:

Critical Systems: 1 (e.g. Core Systems)

Work Stations: .1 Peripherals: .05

B. For purposes of a test, a Subsystem is defined to be any one of the following:

- Workstation;
- Boarding Pass Printer;
- Bag Tag Printer;
- Document Printer;
- Software; Operating system, CUTE application program, LBS application program;

- System Administration Workstation;
- Server;
- Network data communication.

C. A Subsystem shall be considered to be unavailable as long as any major component of the subsystem is not functioning. Major components are defined to be:

- Workstation CPU, keyboard and monitor
- Software; Drivers, GUI;
- Peripheral hardware and communication interfaces;
- Server administration utilities;
- Vendor shall log equipment operation in accordance with functional requirements and down time against the above availability criteria.

D. An inoperative subsystem shall not be deemed unavailable within the meaning of this paragraph if it has become inoperative because of:

- Outage of line power beyond duration of UPS power backup

Malicious damage or vandalism to a component(s) by employees, patrons or others. However, if any undamaged subsystem component should fail in the interim, unavailable time will accrue.

Failure of AIJS or the local Costa Rican telephone company to provided communication network facilities where such failure is not due to CUTE system fault.

E. Should a failure occur in the system that is caused by normal failure rate of hardware, it shall be repaired and the test restarted if the failure impacts testing. Where the failure causes inadequate test data to be collected or a loss of test data, then the test shall be restarted from a point where it can be successfully completed with data to verify compliance with specifications and associated test procedure.

F. If the system "crashes" during a test due to a design error in fault detection and/or automatic recovery in software, then the test shall be stopped. The Vendor shall analyze the cause of the system "crash," document the cause in a system problem report, responsively repair the flaw and document the repair in a corrective action report. The Vendor shall maintain traceability from each experienced problem during a test for corrective action to be taken and modification needed. Where corrective action impacts delivered documentation, the documentation shall be corrected prior to final acceptance.

G. Upon formal written approval of AIJS, testing may continue if a problem has been encountered as long as the Vendor can clearly show and/or demonstrate that the failure is associated only with one function of the system and the corrective action will not impact other areas of the system.

H. Where the system does not perform a function or incorrectly performs but the overall system does not fail, testing may continue under the following conditions:

- The functionality of being able to successfully perform transactions and printing properly works to specifications;
- Transactional archiving operates in accordance with specifications
- Where the failure does not persist to aggravate the functional operation or operator;
- Failure does not cause loss or contamination of transactional data.
- Where the above criteria is not met, the test shall be stopped and corrective action taken and verified prior to restart of testing.

I. Testing may be conducted, in some cases, on a phase-over basis from the old system to the new system. Thus the Vendor must guarantee no operational impact during transition from old to new system. Testing shall not disrupt the normal customer transactions.

12.14.13 As Installed Documentation and Configuration Management

The Vendor's Quality Assurance organization is responsible for assuring that the "as installed" and "as tested" system is correctly and completely documented in such a manner as to support maintenance, independent software development and future expansion of the CUTE by AIAJS. Thus the Vendor's quality assurance extends through Vendor's documentation including engineering drawings, manuals, test procedures and operational procedures.

Appendix A - Glossary of Terms

ATB	Automatic Ticket and Boarding pass printer
BGR	Boarding Gate Reader - used to read magnetically Encoded boarding passes
BTP	Bag Tag Printer
CPU	Central Processing Unit
CUTE ⁴	Common Use Terminal Equipment
DCS	Departure Control System
DOT	Dot Matrix Printer
Gate Counter	Counter used for passenger check-in located in the gate area
GUI	Graphical User Interface
Hz	Hertz or cycles per second
LAN	Local Area Network
LBS	Local Boarding System
Loading BridgePodium	Podium used for boarding passengers located at the entrance to the Loading Bridge
MS	Microsoft
MSR	Magnetic Swipe Reader
MUFIDS	Multi-User Flight Information Display System
NIC	Network Interface Card
ODBC	Open Data Base Connectivity
PDS	Premise Distribution System
PECTAB	Parametric Tables - format table for intelligent airline peripherals

PNL	Passenger Name List
SAT	System Availability Test - 90 day acceptance test of the entire system under full operation
SNMP	Simple Network Management Protocol System Operation Test - 30 day operation test Standard Query Language Single Workstation Operation Test Counter used for departure control and ticket purchases, check-in Uninterruptible Power Supply Windows Internet Naming Service Workstation includes CPU, monitor, keyboard, and pointing device
SOT	System Operation Test-30day operation test
SQL	Standard Query Language
SWOT	Single Workstation Operation Test
Ticket Counter	Counter used for departure control and ticket purchases, checkin
UPS	Uninterruptible Power Supply
WINS	Windows Internet Naming Service
WS	Workstation includes CPU, monitor, Keyboard and pointing device

Appendix B - Standards References

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. Specific reference in Specifications to codes, rules, regulations, standards, manufacturer's instructions or requirements of regulatory agencies shall meet the latest printed edition of each in effect at date of contract. If conflicts exist between referenced requirements, then comply with the one establishing the more stringent requirements. If conflicts exist between referenced requirements and Contract documents, then comply with the one establishing the more stringent requirements. References:

A. American National Standards Institute (ANSI)

- ANSI C2 (1993); National Electrical Safety Code

B. Association of European Airlines (AEA)

- ATB Technical SPECS 1994

C. International Air Transport Association (IATA)

- IATA RP 1797; Common Use Terminal Equipment (CUTE) Systems
- IATA RP 1722c, 722c, 722d, 722e; ATB related resolutions
- IATA RP 740, 740a; BTP related resolutions

D. International Organization for Standardization (ISO)

- ISO 7811; Identification Cards - Recording Technique - Part 2-5
- ISO 9001; Quality Assurance in Design/Development, Production, Installation, and Servicing
- ISO 9003; Quality Assurance in Final Inspection and Test
- ISO 9004; Quality Management and Quality System Elements Guidelines

E. National Fire Protection Association (NFA)

- NFPA 70 (1996) National Electrical Code

Appendix C - Reports To Be Provided To AIJS

For statistical as well as potential billing purposes, the Vendor shall provide the following reports to AIJS in the timeframes as indicated:

- A. Monthly and annual CUTE system activity reports. This report shall conform with accepted airline billing practices. This report shall indicate individual airline activity by day, including time of login, duration of activity, amount of activity, and time of logout. The accuracy of the recorded usage data must be verifiable. The format of the report, method of recording usage data, and delivery schedule will be "industry standard" but, may be modified at the discretion of an AIJS representative.
- B. Monthly and annual CUTE system availability reports. This report shall include availability statistics of all system components including, but not limited to Communications link to individual airline host computer systems, workstations, gateway servers, file servers, application servers, and remote access servers.
- C. Three (3) other user-defined reports to be determined at a later date.