

SECTION C

DESCRIPTION/SPECIFICATION/STATEMENT OF WORK

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SECTION C  
 AUTOMATIC IDENTIFICATION TECHNOLOGY  
 DESCRIPTION/SPECIFICATION/STATEMENT OF WORK

## C.1 SCOPE

## C.1.1 DESCRIPTION AND SPECIFICATION.

a. This description and specification set forth the requirements for the Automatic Identification Technology (AIT) Program. For the purposes of this contract, AIT equipment is that equipment necessary for automatic identification, data collection, keyless data entry and data processing, storage, and retrieval. The AIT Acquisition will provide a base line of bar code and associated automatic identification equipment, software and services and shall be available to system designers and integrators throughout Department of Defense (DoD), Coast Guard (CG) and other Federal Agencies.

b. This equipment includes, but is not limited to, portable and fixed data collection terminals; bar code scanners, wands, slot scanners, and wedges; voice recognition devices; printers (laser, thermal/thermal transfer); communications devices (modems, wire and radio frequency networks); magnetic stripe encoders and readers and storage devices (memory, laser and integrated circuit cards together with their associated readers/ writers). The equipment will provide a common base line of bar code equipment and microcircuitry devices for both tactical and non-tactical applications. Software will include equipment operating systems, bar code label and form generation, bar code application generation, and compiler languages. Services will include maintenance, training, installation, technical engineering services, translation of small applications for use with existing bar code systems, and development of applications. Documentation shall be provided.

C.1.2 AIT APPLICATIONS. Some anticipated applications of AIT are in the areas of personal identification, health care, food service, inventory management, logistics, retail sales, access control, transportation, and personnel management.

C.1.3 AIT OBJECTIVES. The objectives of the AIT program are to provide: a common, integrated structure for the automatic collection, storage, retrieval, processing, transmission, and receipt of data; standardization and interoperability among Government users of AIT equipment; and flexible systems and equipment that can grow in size and capability, adapting to the needs of the Government.

C.1.4 GEOGRAPHIC LOCATIONS. AIT equipment will be used worldwide by DoD, CG and other Federal Agencies. Various locations have differing commercial power systems, voltages, frequencies, power connectors, communications regulations, and regulatory requirements that shall be satisfied by the Contractor.

## C.2 APPLICABLE DOCUMENTS

C.2.1 ATTACHMENTS. Section J lists the following attachments:

- Attachment 1 - STANDARDS AND SPECIFICATIONS
- Attachment 2 - DICTIONARY AND GLOSSARY

- Attachment 3 - DD FORM 1348-1 AND DD FORM 1387
- Attachment 4 - IDENTIFICATION PLATE
- Attachment 5 - EXAMPLE TASK SELECTION MATRIX
- Attachment 6 - EXAMPLE PROGRAM OF INSTRUCTION
- Attachment 7 - EXAMPLE LESSON PLAN
- Attachment 8 - STUDENT TRAINING COURSE FORMS

- C.2.2 STANDARDS AND SPECIFICATIONS. The documents listed in Attachment 1 form a part of this technical specification. In the event of conflict between the listed documents and the contents of Section C, the technical specifications provided in Section C shall govern. AIT equipment and software shall meet the applicable portions of these documents as stated in Section C; supporting documentation shall be provided where specified. AIT bar code symbologies shall comply with DoD and Industry Standards and Specifications for Code 39, Code 128, CODABAR, Interleaved 2 of 5, European Article Numbering System (EAN), and Universal Product Code (UPC). In addition to these linear bar code symbologies, two-dimensional symbology PDF417 shall be supported. During the life of the contract, as other standards are developed, the Government may require other symbologies. Ultra-high density Code 39 bar code is defined as within the range of: greater than 9.4 CPI, and up to 12.5 CPI.
- C.2.3 DICTIONARY AND GLOSSARY. Definitions and meanings of data processing terms used in this Specification (Section C and applicable appendices) shall be interpreted in accordance with FIPS PUB 11-2 (ANSI X3/TR-1-82), and of communications terms in accordance with FED-STD-1037, Glossary of Telecommunications Terms. Definitions of other terms and acronyms appear in Attachment 2.
- C.2.4 AVAILABILITY OF DOCUMENTS. Copies of applicable documents may be obtained from the respective sources identified on the last pages of Attachment 1.
- C.3 AIT REQUIREMENTS AND STATEMENT OF WORK
- C.3.1 AIT REQUIREMENTS.
- C.3.1.1 General. The Contractor shall provide all necessary hardware, software, firmware, cables, connectors, accessories, maintenance, training, and documentation. Because of the diversity of applications, the Contractor shall provide the technical engineering services to configure, operate, and maintain the appropriate hardware and software to satisfy the specific application. AIT equipment shall be user-friendly, commercial-off-the-shelf (COTS) equipment capable of operating worldwide. The Government will require Contractor assistance in completing necessary applications when AIT equipment is installed in foreign countries. All Contractor-supplied operating systems software and firmware shall be installed prior to delivery. AIT equipment shall be capable of supporting operations in both the tactical and non-tactical environment. A tactical environment is defined as similar to a heavy industrial setting that may have a potentially explosive atmosphere. In this rigorous environment, AIT equipment may be subjected to rough handling, operational use, shock, and vibration caused by dropping or transportation over rough terrain. A non-tactical environment is defined as a normal office or light

industrial setting, both indoors and outdoors.

C.3.1.2 Mandatory Requirements. The Contractor shall satisfy all stated technical requirements of this Specification, and the referenced Attachments and Exhibit. Requirements stated are a minimum, unless specified otherwise.

C.3.1.3 Original Equipment Manufacturer (OEM) Engineering Changes (ECs). The Government requires that all OEM-sponsored ECs adopted prior to the date of contract award be incorporated into the equipment delivered under this contract.

C.3.1.4 Notification of Changes. The Contractor shall notify the Contracting Officer of all changes prior to commencing installation of any modifications. The Contracting Officer shall be notified of completion of installation of all changes with ECs or safety changes.

C.3.1.5 Accepted Changes. A change that is accepted by the Contracting Officer for installation shall be installed in all equipment as specified in the contract modification.

C.3.1.6 Commercially Available Equipment. Commercially available equipment is required.

a. An item is "available" if it meets the Terms and Conditions of this document and can be delivered in accordance with the delivery schedule in Section F, of this document.

b. Equipment that must be developed to meet the requirement shall be considered unacceptable.

C.3.1.7 Current Production. All equipment shall be state-of-the-art technology and in current production.

a. "State-of-the-art" is defined as the most recently designed components that are in current production, marketed, available, maintained, and supported in accordance with the mandatory requirements specified elsewhere in this document. Prototype or development equipment is not acceptable. Out-of-date or discontinued equipment is not acceptable.

b. To be in "current production", the equipment must meet the following criteria:

(1) The equipment may contain components that are new or used, provided that the used components are warranted by the manufacturer as being equivalent to new in performance.

(2) Equipment that is remanufactured, refurbished, or reconditioned in accordance with the New or Used Equipment Clause (contained elsewhere in this document), may be acceptable as long as it is an item of equipment of the latest technology and meets the requirements of this document.

C.3.1.8 Interface Requirements. Contractor-furnished equipment shall interface and operate with the hardware configurations described elsewhere in this document without requiring modification to

configuration hardware. AIT equipment interfaces with AT-compatible and other host computers shall be accomplished through the use of break-out boxes, where required. Interfaces shall be compatible with EIA-232-C standards whenever possible and shall not be Contractor-specific or proprietary. Interfaces can be non-EIA-232-C if a data throughput advantage is provided and the interface is not Contractor-specific or proprietary.

- C.3.1.9 Equipment Controls. If the Contractor's equipment provides additional controls (beyond the basic set prescribed by FIPS PUB 1-2) such controls shall conform to FIPS PUB 86, and ANSI X3.4-1977, X3.32-1973 and X3.41-1974. The graphic representation of such codes shall conform to ANSI X3.4-1977, X3.32-1973 and X3.41-1974.
- C.3.2 FUNCTIONAL INTEGRATION. The Contractor shall provide equipment capable of integrating with other provided AIT equipment into operating configurations necessary to accomplish the automated collection, storage, retrieval, receipt, processing, and transmission of data.
- C.4 HARDWARE REQUIREMENTS
  - C.4.1 BATTERY-OPERATED AIT EQUIPMENT. Battery-operated AIT equipment shall be delivered with two sets of rechargeable batteries.
    - C.4.1.1 Rechargeable Batteries. Rechargeable batteries shall supply a minimum of eight hours continuous operation and shall require no more than ten hours to fully charge or discharge. Rechargeable batteries shall be capable of charge operations without removal from AIT equipment. Batteries or battery packs shall be user-replaceable in the field in less than five minutes, and without special tools.
    - C.4.1.2 AC Operation. The Contractor shall provide separately orderable, external, AC adapters for battery-operated AIT equipment that permit operation of the equipment from the commercial power source of the country where the equipment is located. AIT equipment shall be operable from the separately orderable, external AC adapter which works even if the batteries are inoperable.
    - C.4.1.3 RAM Back-up Power. Each battery-operated AIT device with internal RAM shall have internal back-up power to preserve data stored in user RAM during periods of low-power operation and battery recharging. Back-up power shall provide sufficient time to allow the operator to replace or recharge the primary power source.
    - C.4.1.4 Low-power Operation. Battery-operated AIT equipment shall provide the operator with both audible and visible signals when battery power is low. The low battery power indication shall provide the operator with at least 5 minutes of advanced warning of an automatic shutdown. To preserve stored data and to conserve power, battery-operated AIT equipment shall automatically shut down before battery power is completely depleted.
  - C.4.2 POWER REQUIREMENTS. All non-battery powered AIT electrical devices shall be Nationally Recognized Testing Laboratories (NRTLs) certified. The Contractor shall provide adapters and cables for AIT equipment to permit use of locally available commercial power. Where feasible, the Contractor shall provide the capability to allow

the user to select power requirements by the use of either a selector switch or an easily changed adapter. AIT equipment shall be compatible with the power supply and connectors for the geographical area (as specified in the delivery order) in which it is to be operated, including:

GEOGRAPHICAL AREA	VOLTAGE	CYCLE	PLUG TYPE
CONUS, ALASKA, HAWAII, U.S. POSSESSIONS AND TERRITORIES	115 VOLTS	60 HERTZ	TYPE 1
WESTERN EUROPE: EITHER OR	127 VOLTS 220 VOLTS	50 HERTZ 50 HERTZ	TYPE 2 TYPE 2
JAPAN AND KOREA	110 VOLTS	50 OR 60 HERTZ	TYPE 3
PANAMA: EITHER OR	115 VOLTS 120 VOLTS	60 HERTZ 60 HERTZ	TYPE 3 TYPE 3
GERMANY	220 VOLTS	50 HERTZ	TYPE 4

NOTES:

Plug Type 1 is the conventional, U.S. 2-blade-plus-ground-pin safety connector.

Plug Type 2 is the European, 2-prong connector with 4 mm diameter prongs at 19 mm distance.

Plug Type 3 is the older, U.S. 2-blade connector.

Plug Type 4 is the German safety connector with 5 mm diameter prongs at 19 mm distance, with an additional ground connector.

C.4.3 CABLES, ADAPTERS, AND BREAK-OUT BOXES. The Contractor shall provide all cables and adapters required to install, power (if not battery-powered), and connect any ordered device to a DB-25 or DB-9 EIA-232-C connector, shall be included as part of the provided equipment. The DB-25 EIA-232-C cables will be used to connect each of the host computers. Break-out boxes will be ordered when required. All cables normally provided with the sale of each piece of equipment in the commercial marketplace, and their normally provided length, shall be provided with the delivery of the device to the Government.

C.4.3.1 Cables. Notwithstanding the inclusion of required cables with the equipment, additional/replacement cables of the following lengths shall be available for ordering.

- a. 6-foot DB-25 EIA-232-C cable.
- b. 10-foot DB-25 EIA-232-C cable.
- c. 15-foot DB-25 EIA-232-C cable.

- d. 25-foot DB-25 EIA-232-C cable.
- e. 6-foot Centronics to DB-25 cable.
- f. 8-foot DB-9 Male to DB-25 Female Interface cable.

C.4.3.2 Adapters. The following adapters are to be available for ordering.

- a. DB-9 to DB-25 adapter.
- b. Male-to-Male DB-25 adapter.
- c. Female-to-Female DB-25 adapter.

C.4.3.3 Break-out Boxes. Break-out boxes are required to eliminate the need to buy custom-pinned cables. These break-out boxes will serve three functions: to permanently reconfigure the EIA-232-C leads between any two devices for all 25 pins; to allow the cross-over, patch, and jumpering of any combination of leads; and, to serve as a gender-matcher interface between two same-sex connectors. Two break-out boxes are necessary: the first will analyze all 25 leads and automatically configure itself when connected between both devices using the EIA-232-C cable; the second will require the user to manually cross-over, patch, or jumper the 25 leads.

- a. Automatic Configuration Break-out Box.
- b. Manual Configuration Break-out Box.

C.4.3.4 Government Computers. The following is a partial listing of the computers in use today by the Government. The list is typical but not all-inclusive: IBM PC, PC/XT, PC/AT, PS/2 or equivalent computers; Zenith Z-248 series, MS-DOS 3.1 or later; Sperry 5000 series computers and SVT-1220 terminals; Wyse 1100 PC Series, MS - DOS 2.1 or later; Prime EXL 320 Small Multi-user System (Army SMC contract); Everex PC (Army SMC contract); UNISYS 400 PC; UNISYS Series 800/20C PC (USAF Desktop III contract); Intel 310 Multi-user system; Intel 320 computer; Burroughs B-26/28 (Army TACCS computer); Apple Macintosh computers; IBM 32xx or equivalent terminals; IBM 4341 series computers; Sperry 1100 and 2200 computers; and, Sperry UTS 40 PC.

C.4.4 PORTABLE DATA COLLECTION DEVICE (PDCD).

C.4.4.1 General Requirements. Portable data collection devices (PDCDs) are microprocessor-based, hand-held devices designed to gather source-entry data. The Government has a requirement for a family of PDCDs that meets a variety of operational needs in widely varying environmental conditions. Typical environments include office settings that require PDCDs with no hardening, a tactical environment that requires industrially hardened, intrinsically safe PDCDs, and a warehouse environment where one-handed operations will require bar code scanners embedded in or integral to the PDCDs. Intrinsically safe devices shall be certified as capable of safe operations in hazardous locations defined by the National Electrical Code for at least Class 1, Division 2, Groups A, B, C, and D and Class 2, Division 2, Groups F and G, and Class 3, Division 2 locations. The bar code scanners shall be capable of scanning low,

medium, high, and ultra-high density Code 3 of 9 (Code 39) bar code symbologies, as defined in MIL-STD-1189B and C.2.2. The family of PDCDs will be used in a variety of settings; for example, offices, warehouses, food service applications, motor pools, retail sales areas, and environmentally uncontrolled areas. The PDCD shall support a wide range of AIT applications. PDCDs shall have memory options for large applications, shall be user-programmable, and shall provide the operator with assistance or prompts to perform required functions. The PDCD shall be reliable and user-friendly. The PDCD shall be able to transmit stored data to a PC or host computer for further processing.

- C.4.4.2 Functional Requirements. The PDCD family shall be sufficiently versatile in order to satisfy the following requirements: real-time and batch processing; flexibility in attaching a bar code non-contact scanner or wand; bar code scanner physical integration with the PDCD; interface with peripheral devices used to read/write to integrated circuit cards, and Personal Computer Memory Card International Association (PCMCIA) PC memory cards; interface with a peripheral device used to read magnetic stripe cards; data collection in a location that requires an intrinsically safe device; and data collection for workplaces requiring industrially hardened devices. PDCD memory shall be at least 1 Mbyte of RAM. In addition to RAM, a minimum of 64 Kbytes of non-volatile memory modules for storage of applications programs shall be included in the basic configuration and shall use EEPROM technology.
- C.4.4.3 Interfaces. The PDCDs shall interface with the following peripheral devices: bar code scanners or readers; integrated circuit card reader/writers; PCMCIA PC memory card reader/writers; and magnetic stripe readers. Exception are those one handed PDCD's with an integral scanner not requiring interfaces with non-contact or digital wand scanners. The Contractor shall provide a family of PDCDs that can interface with the peripherals and are also capable of meeting the following requirements: the PDCDs shall accept data from a bar code scanner or reader, integrated circuit card, PCMCIA PC memory card, magnetic stripe card, or manual data entry by keypad or keyboard; the PDCDs shall write data to integrated circuit cards, and PCMCIA PC memory cards; and, the PDCDs shall support various types of bar code scanners, such as wand bar code scanners; hand-held, non-contact, bar code scanners; and badge (or slot) bar code scanners. For portable operation, the ICC and PCMCIA PC card reader/writers, and the magnetic stripe reader interface, shall be integral or attached to the PDCD. When in use with the PDCD, the ICC and PCMCIA PC card reader/writers, and the magnetic stripe reader, shall be as mobile or portable as the PDCD and shall not encumber the operator. The Government recognizes that the PDCD may no longer be intrinsically safe when the ICC and PC card reader/writers, and the magnetic stripe reader, are attached.
- C.4.4.4 Separately Orderable Components. The following separately orderable components shall be available for the PDCD.
  - a. RESERVED
  - b. RESERVED
  - c. AC adapter and cord.

d. Interface Cradle/Charger. The Interface Cradle/Charger shall permit EIA-232-C interface between the PDCD and a host computer. The unit shall also charge the batteries in the PDCD.

e. Battery Charger/Discharger Unit. The Battery Charger/Discharger unit shall be capable of charging batteries either in or out of the PDCD. The Unit shall be capable of discharging/ charging the batteries when they are removed from the PDCD.

f. Heavy-duty PDCD Holster, or Integral Carrying Case, with adjustable straps or clips for belt attachment, for all provided PDCDs.

g. Shoulder strap, to fit both the Heavy-duty PDCD Holster and the Heavy-duty Scanner Holster for all provided PDCDs.

h. Multiple Battery Charger/Discharger Unit for the PDCD. The Multiple Battery Charger/Discharger unit shall be capable of charging at least 4 batteries simultaneously when they are removed from the PDCD. The Multiple Battery Charger/Discharger shall contain all necessary cables, power supplies and adapters to permit stand alone operation on a worldwide basis, as described in paragraph C.4.2.

i. Multiple Battery Charger/Discharger Unit for the one-handed PDCD. The Multiple Battery Charger/Discharger unit shall be capable of charging at least 4 batteries simultaneously when they are removed from the one-handed PDCD. The Multiple Battery Charger/Discharger shall contain all necessary cables, power supplies and adapters to permit stand alone operation on a worldwide basis, as described in paragraph C.4.2.

C.4.4.5 Consumable Supplies. Rechargeable Batteries.

C.4.5 HAND-HELD, NON-CONTACT, BAR CODE SCANNER.

C.4.5.1 General Requirements. The Contractor shall provide bar code scanners that are lightweight, ergonomically designed, and operator-activated. Laser scanners shall comply with safety requirements prescribed by the Bureau of Radiological Health (BRH) 1040 for Class II laser devices. To allow for the greatest flexibility possible, the Contractor shall provide all scanners equipped with connectors that will interface with the PDCDs and Fixed Bar Code Readers provided under this contract, excepting those PDCDs and RF PDCDs with an integral scanner. A coiled, strain-relieved, cable between 3 and 8 feet in length shall also be provided to support scanner/PDCD interfaces.

C.4.5.2 Functional Requirements. The Contractor shall provide hand-held, non-contact, bar code scanners that are capable of scanning low, medium, high, and ultra-high density Code 39 bar code symbologies as well as the other symbologies cited in paragraph C.2.2 and defined in MIL-STD-1189B. The scanners are also required to scan bar codes on Item Release/Receipt Documents (DD Form 1348-1) and Military Shipment Labels (DD Form 1387), as defined in MIL-STD-129L and shown in Attachment 3. Bar code scanners shall be capable of scanning bar

codes printed with thermal, thermal transfer, dot matrix, ink jet, and laser technologies, as well as bar codes printed on colored substrates that meet the print-contrast-signal requirements prescribed in MIL-STD-1189B. They shall be capable of successfully withstanding a storage temperature range of -20 to +150 degrees Fahrenheit.

a. Hand-held, Non-contact Bar Code Scanner. This scanner shall meet all the above requirements.

b. Intrinsically safe, Hand-held, Non-contact Bar Code Scanner. This scanner shall meet the above requirements and be certified intrinsically safe, as defined in paragraph C.4.4.1. When attached to and operated with the provided intrinsically safe PDCDs, the resultant configuration is to remain intrinsically safe.

C.4.5.3 Separately Orderable Components. The Contractor shall provide a holster for the scanner when it is not in use. The holster shall be provided with a strap to secure the scanner in the holster.

C.4.6 POINT-OF-SALE SCANNER.

C.4.6.1 General Requirements. The Contractor shall provide a point-of-sale (POS) scanner that is designed to allow in- or under-counter mounting in an indoor, retail environment. The POS scanner shall be sealed against spills and capable of scanning the bar code symbologies listed in paragraph C.2.2.

C.4.6.2 Functional Requirements. The POS scanner shall be activated when a bar coded item is passed over the scanner's window. An operator-adjusted, audible signal shall be provided to indicate successful read or non-read. The POS scanner shall be capable of omnidirectional scanning and withstand direct exposure to office-level fluorescent lighting and high-pressure sodium lamps. The scanner shall support EIA-232-C connections with user-selectable parameters to support data rates 300 to 19200 bps; parity odd, even, mark, or space; 7 or 8 data bits; and 1 or 2 stop bits. The POS scanner shall also support inputs from hand-held bar code scanners.

C.4.7 DIGITAL WAND SCANNER.

C.4.7.1 General Requirements. The Contractor shall provide solid-state, digital wand bar code scanners. The digital wand bar code scanners shall be capable of scanning low, medium, high, and ultra-high density Code 39 bar code symbologies, as well as the other symbologies described in C.2.2 and MIL-STD-1189B. If more than one scanner is provided to meet this requirement, each shall be clearly differentiated (marked) with the scanning density range. The scanners shall be lightweight and ergonomically designed. To allow for the greatest flexibility possible, the Contractor shall provide all scanners equipped with connectors that will interface with all fixed bar code readers and PDCD's provided under this contract, with the exception of PDCDs and RF PDCDs with integral scanners. A strain-relieved, coiled cable between 3 and 8 feet in length shall also be provided to support scanner/PDCD interfaces.

C.4.7.2 Functional Requirements. The Digital Wand Scanner shall conform to the general requirements above and be capable of reading the bar

code symbologies described in C.2.2. The Contractor shall provide a scanner that is intrinsically safe for use in an explosive environment.

C.4.7.3 Separately Orderable Components. The Contractor shall provide the following Separately Orderable Components for the digital wand scanner: Desk stand holder.

C.4.8 BAR CODE SLOT SCANNERS.

C.4.8.1 General Requirements. The Contractor shall provide solid-state bar code slot scanners capable of scanning low, medium, and high density Code 39 bar code symbologies as defined in MIL-STD-1189B, and those additional bar code symbologies described in C.2.2.

C.4.8.2 Functional Requirements. The Contractor shall provide two versions of the Bar Code Slot Scanner: a decoding version and a non-decoding version. Strain-relieved, coiled, cables between 3 and 8 feet in length shall be provided to support scanner interfaces. The scanners shall be provided with an adjustable read height for cards or forms that have bar codes printed at slightly varying distances from the edge of the card or form.

a. Bar Code Slot Scanner, Decoding, Type I. The Contractor shall provide a decoding version of a slot scanner that can interface with AT-compatible computers.

b. Bar Code Slot Scanner, Non-decoding, Type II. The Contractor shall provide a non-decoding version of the bar code slot scanner for connection to Fixed Bar Code Readers (C.4.9.2.b.).

C.4.9 FIXED BAR CODE READER.

C.4.9.1 General Requirements. The Contractor shall provide a family of Fixed Bar Code Readers (FBCRs) that support wand, hand-held non-contact bar code scanners, and non-decode Bar Code Slot Scanners.

C.4.9.2 Functional Requirements. The FBCRs will be used with various computer systems that use EIA-232-C connections, and/or a keyboard wedge connection.

a. Fixed Bar Code Reader, Keyboard/Computer Configuration. This FBCR will typically be utilized in a one-to-one relationship to a video terminal in the host system; for example, an office setting where operators scan bar coded information into a system instead of manually entering the data on a keyboard. This configuration shall be provided with a keyboard "wedge" interface cable to connect to a host.

b. Fixed Bar Code Reader, Multiple Input. This FBCR shall support multiple input scanners. These FBCRs shall contain both a prompting display and a keyboard to input data in case of an unsuccessful bar code scan. An example of this requirement is a typical work-in-progress environment with only one computer terminal available, and work flows from station-to-station where bar coded data is scanned from satellite stations into the computer system through the FBCR. This arrangement eliminates the requirement for each worker to have a dedicated computer terminal.

## C.4.10 BAR CODE PRINTERS.

C.4.10.1 General Requirements. The Contractor shall provide a table-top, thermal transfer, bar code label printer; two types of table-top, thermal transfer, bar code label/form printers; and, a portable, thermal transfer, bar code label printer. All four types of bar code printers shall be capable of printing, in clear (unencoded) text, the full 128-character ASCII set, Code 39, Interleaved 2 of 5, CODABAR, Code 128, UPC, and EAN bar code symbologies, human readable interpretation, and alphanumeric text.

## C.4.10.2 Functional Requirements.

a. Type I, Portable, Bar Code Label Printer. The Type I, Portable, Bar Code Label Printer must be easily carried with one hand or attached to a carrying strap, and shall be powered by commercially available rechargeable batteries as well as AC and DC adapter power. The Type I, Portable, Bar Code Label Printer shall have a minimum 1.0-inch throat width and be a self-contained, stand-alone, on-demand printer. A version of the Type I printer shall be provided which is configured to print an Item Release/Receipt Document (IRRD) (DD 1348-1). The contractor shall provide the IRRD electronic form image with the printer.

b. Type II, Bar Code Label Printer. The Type II, Bar Code Label Printer shall have a minimum throat width of 3.0 inches, and be capable of Code 39 bar code print densities of 7.0 CPI. The Contractor shall provide a power-driven, take-up (rewind) reel (for 8-inch outside diameter roll) to spool labels as a Separately Orderable Component. If self-strip capability is provided, label backing material shall be rewound within the printer.

c. Type III, Bar Code Label/Form Printer. The Type III, Bar Code Label/Form Printer shall support a bar code print density of at least 9.0 CPI and print labels or forms at a speed of at least 6.0 inches per second. The printer shall be capable of permanently storing (in protected, internal memory) and printing an Item Release/Receipt Document (IRRD) (DD 1348-1) and a Military Shipment Label (MSL) (DD 1387). The Contractor shall provide the IRRD and MSL electronic form images to be stored in the printer memory. The printer shall also be capable of storing an additional user-designed form of similar size. The electronic form images shall be protected in memory. A power-driven, take-up (rewind) reel (for 8-inch outside diameter roll), a butt cutter, and a laminator shall be provided as Separately Orderable Components.

d. Type IV, Bar Code Label/Form Printer. The Type IV, Bar Code Label/Form Printer shall support a bar code print density of at least 12.5 CPI and print labels or forms at a speed of at least 6.0 inches per second. The printer shall be capable of storing (in protected, internal memory) and printing an Item Release/Receipt Document (DD 1348-1) and a Military Shipment Label (DD 1387). The Contractor shall provide the IRRD and MSL electronic form images to be stored in the printer memory. The printer shall also be capable of storing an additional user-designed form of similar size. The electronic form images shall be protected in memory. A power-driven, take-up (rewind) reel (for 8-inch outside diameter roll)

shall be provided as a Separately Orderable Component.

C.4.10.3 Accessories. The following accessories shall be provided by the Contractor: Two replaceable ribbons (resin-based) equal to the throat width of the provided printers and an Operator Maintenance Kit.

C.4.10.4 Separately Orderable Components. The following Separately Orderable Components shall be made available by the Contractor:

- a. Type I Portable Bar Code Label Printer Carrying Strap.
- b. Type II Printer Power-driven, Take-up (rewind) Reel.
- c. Type III Printer Power-driven, Take-up (rewind) Reel.
- d. Type IV Printer Power-driven, Take-up (rewind) Reel.
- e. Type III Printer Butt Cutter with Laminator.
- f. Charger/discharger unit for rechargeable batteries for the Type I Portable Printer.
- g. AC adapter and cord for the Type I Portable Printer.
- h. RESERVED
- i. Type II Label Dispenser with self-strip capability.
- j. Type III Label Dispenser with self-strip capability.
- k. Type IV Label Dispenser with self-strip capability.

C.4.10.5 Consumable Supplies.

- a. RESERVED
- b. Portable Rechargeable batteries.

C.4.11 PORTABLE BAR CODE ANALYZER AND ANALYZER PRINTER.

C.4.11.1 General Requirements. The Contractor shall provide a portable bar code analyzer and analyzer printer. The analyzer and analyzer printer shall be used to scan bar code symbols to verify that essential parameters are in compliance with published technical descriptions, and to print out the results.

C.4.11.2 Functional Requirements. The Contractor shall provide a fully portable, bar code symbol quality assurance device to confirm wide-to-narrow ratios, display print contrast and reflectance measurements, and decode and verify the symbologies listed in C.2.2. The bar code analyzer shall allow the user to analyze and verify the labels and equipment provided under this contract by checking the four bar code symbol elements: data format, encodation, print contrast, and bar and space dimensions. The analyzer shall be constructed of an impact-resistant material sufficiently strong for industrial use. The analyzer shall be hand-held, lightweight, and ergonomically designed. The analyzer shall be supplied with a hand-

held scanner. The analyzer shall have an LCD type display capable of displaying a minimum of two lines, with at least 16 characters per line. The analyzer shall provide an audible and visible indication to the operator that a bar code is in- or out-of-specification in accordance with MIL-STD-1189B or applicable industry standards. The analyzer shall have the capability to incorporate the ANSI Standard symbol grade A through F guidelines for bar code print quality.

a. Portable Bar Code Analyzer. The portable bar code analyzer shall meet all of the above requirements.

b. Portable Bar Code Analyzer Printer. The portable bar code analyzer printer shall provide an easily readable, printed result of bar code analyses.

C.4.11.3 Accessories. The Contractor shall provide the following for the bar code analyzer: two sets of bar code test sheets for those bar code symbologies listed in C.2.2: one set to be in-specification, the other set out-of-specification.

C.4.11.4 Separately Orderable Components. The Contractor shall provide the following Separately Orderable Components for the bar code analyzer and analyzer printer:

a. Reflectance-measurement holder for a wand or non-contact bar code scanner.

b. Battery charger/discharger unit.

c. Bar Code Analyzer AC adapter and cord.

d. Bar Code Analyzer Printer AC adapter and cord.

C.4.11.5 RESERVED.

C.4.12 PAGE PRINTER.

C.4.12.1 General Requirements. The Contractor shall provide two types of non-impact page printers. The Contractor shall provide page printers that operate in an on-line mode and that interface with the host computers.

C.4.12.2 Functional Requirements. The two types of page printers shall be capable of printing the full ASCII character set. The page printers shall be able to print the medium and high density bar code symbologies listed in paragraph C.2.2. In addition, the page printers shall provide internal, electronic form image storage capable of holding at least six Item Release/Receipt Documents (IRRL) (DD Form 1348-1), or six Military Shipment Labels (MSL) (DD Form 1387), or similar electronic form images. The Contractor shall provide the IRRL and MSL electronic form images to be stored in the printer memory. The page printers shall have access to internally stored, electronic form images, without downloading. The page printers shall provide a resolution of at least 300 by 300 dots-per-inch.

a. Type I Page Printer. The Type I Page Printer shall have a minimum-rated print speed of 12 pages-per-minute when printing text

on 8 by 11 inch paper. The printer shall have a minimum of 2 Mbytes of RAM and shall be user-expandable to 4 Mbytes. The page printer shall be capable of PCL 5 emulation.

b. Type II Page Printer. The Type II Page Printer shall have a minimum-rated print speed of 30 pages-per-minute printing text on 8½ by 11 inch paper. The printer shall have a minimum of 4 Mbytes of RAM. The printer shall be capable of PCL 5 emulation.

C.4.12.3 Accessories. The Contractor shall provide one extra toner cartridge with each printer delivered.

C.4.12.4 Separately Orderable Components. The Contractor shall provide the following Separately Orderable Component:

a. Upgrade to 4 Mbyte, add-on memory module for a Type I Page Printer.

b. RESERVED

C.4.12.5 RESERVED.

C.4.13 RADIO FREQUENCY MODEM.

C.4.13.1 General Requirements. The Contractor shall provide radio frequency (RF) modems to send data to a remote host computer for processing. These RF modems will be used with devices such as PDCDs and host computers.

C.4.13.2 Functional Requirements. The Contractor shall provide two types of RF Modems. They are narrow-band (license required) and spread-spectrum (no license required). The Government foresees the use of more than two of the same type modem in close proximity with potential interference of one with another. If additional equipment is required to provide a solution which permits the concurrent use of multiple modems, it shall be provided. The Contractor shall provide the following categories of modems for each AIT requirement.

a. Narrow Band RF Modem. The Contractor shall provide two versions of narrow-band modems.

1. VHF Narrow-band Modem. This VHF modem shall be a narrow-band transceiver with selectable transmission rates from 1200 bps to at least 4800 bps, and full-duplex. VHF modem shall permit remote frequency changing and receive sensitivity adjustments. In this modem a signal strength meter will be integral to the modem. The VHF modem shall have an optional antenna increasing the operational range of the modem and carrying case for the modem and antenna.

2. UHF Narrow-band Modem. This UHF modem shall be a narrow-band transceiver with selectable transmission rates from 1200 bps to 9600 bps, and full-duplex.

b. Spread-spectrum RF Modem. This RF modem shall be a full-duplex, bi-phase, modulated, spread-spectrum modem operating from 902 Mhz to 928 Mhz. The modem shall have the capability to select transmission rates from 1200 bps to 9600 bp and shall comply with

the Federal Communications Commission's (FCC) new Code of Federal Regulations Part 15 requirements which go into effect 23 June 1994.

C.4.14 EQUIPMENT CONNECTIVITY CAPABILITY.

C.4.14.1 General Requirements. The Contractor shall provide equipment connectivity devices to connect products such as bar code scanners, readers, modems, and printers to a host computer.

C.4.14.2 Functional Requirements. The Contractor shall provide the capability to multiplex low-speed communications lines into a single high-speed communications circuit. These devices shall also be capable of being used in remote applications. The devices shall allow for both asynchronous and Binary Synchronous Control (BCS) communication with the host. The Contractor shall provide the following capabilities.

a. Basic Connectivity Device. This device shall provide at least 16 ports for connection of ancillary AIT devices.

b. Extended Connectivity Device. This equipment connection device shall have the capability of supporting at least 64 AIT devices.

C.4.15 VIDEO DISPLAY UNIT TERMINAL.

C.4.15.1 General Requirements. The Contractor shall provide amber-screen, Video Display Unit (VDU) terminals for use in AIT applications with fixed bar code readers, all printers (except the Type I, Portable, Bar Code Label Printer), etc. The Contractor shall provide VDU terminals that emulate the Lear-Siegler ADM31 and DEC VT-220 terminals.

C.4.15.2 Functional Requirements. The Contractor shall provide an amber-screen, Video Display Unit terminal with at least a 12-inch diagonal screen and the following attributes: display format of at least 24 lines by 80 characters, plus a status line that indicates terminal configuration; a keyboard; cursor controls to enable the operator to backspace, forward space, space-up, space-down, home, and return; automatic self-test performed upon power-up, with notification to operator; and, programmable, screen time-out.

C.4.16 RADIO FREQUENCY DATA COMMUNICATION SYSTEM.

C.4.16.1 General Requirements. The Contractor shall provide the implementation of real-time, Radio Frequency Data Communication (RFDC) systems, in both narrow-band and spread-spectrum frequency ranges, for linking information to material flow in various applications; for example, in warehouse and retail operations. The RFDC system shall consist of three major components: RF terminals, controllers, and transceiver units. The RFDC system shall be capable of operating at frequencies associated with the pertinent narrow band or spread-spectrum device. Those components operating at spread-spectrum frequencies shall comply with the FCC's new Code of Federal Regulations Part 15 requirements which go into effect 23 June 1994.

C.4.16.2 Functional Requirements. The Contractor shall provide the following

categories of RF terminals that support a wide range of AIT applications, including processing and storing data. The RF terminals shall be user-programmable and capable of providing the user with assistance or prompts to perform required functions. The RF terminals shall be small and lightweight, and easily held in one hand. They shall be designed for low maintenance, be user-friendly, and rugged enough for use in harsh environments.

a. RF Portable Data Collection Terminal. The Contractor shall provide a PDCD with an RF capability, data display, alphanumeric keypad and 1 Mbyte of RAM. The terminal shall support connectivity with all provided bar code scanners, except for the Bar Code Slot Scanner and POS Scanner.

b. Forklift-mounted RF Collection Terminal. The terminal shall be similar to and have the capabilities of the portable data collection terminal; however, the device shall be mounted on a forklift and powered by the vehicle's electrical system. The voltage of 12 to 48 VDC (Nominal) and 120 volts AC must be supported.

c. RF Bar Code Laser Scanner Terminal. This PDCD shall incorporate the scanning device and support a wide range of typical bar code scanning distances. Long-range scanning is not specifically sought by the Government. The Bar Code Laser Scanner RF Terminal shall be at least 1 Mbyte of RAM.

d. RF Transceiver Unit. The RF transceiver units shall house the FM transmitter/receiver and communicate with both the communications controller and the terminals for transmitting data.

e. Communications Controller. The communications controllers shall be capable of accommodating interface to host computers using EIA-232-C and RS-422 interfaces or high speed network technologies; one of which shall be Ethernet 10 Base-T. Controllers requiring internal interface-card installation shall be selected at the time of product order. Post delivery circuit card installation shall be user installed with Intermec assistance, (e.g. written instruction and on-line assistance).

(1) EIA-232-C and RS-422 Interface. The communications controllers shall be capable of communicating with host computers using EIA-232-C and RS-422; one shall be selected at the time of the installation, at minimum data rates from 300 bps to 19200 bps. The communications controller shall handle message timing, buffering, and protocol-matching to the host computer.

(2) High-speed network technology Interface: Such controllers shall be capable of connecting 902 MHz and 2.4 GHz RF data collection networks upline to high speed network technologies to include Ethernet, Token Ring, IBM Twinaxial or Coaxial, or SDLC. Desired interface shall be determined and selected at time of product order to assure proper interface card is installed within the controller. The communications controller shall handle message timing, buffering, and protocol-matching to the host computer.

f. RF Repeater. The RF Repeater extends the effective

range of the RF data communications system. The Repeater shall be capable of receiving RF data from an RF Terminal for re-broadcast to the RF transceiver unit.

g. RF Data Communications System Gateway. The RF Data Communications System Gateway shall provide a means of connecting non-RF peripheral devices, such as bar code label printers, to the RF data communications system from anywhere covered by the RF network. The Gateway shall provide an EIA-232-C interface to non-RF peripheral devices.

C.4.16.3 Separately Orderable Components. The Contractor shall provide the following Separately Orderable Components:

- a. RESERVED
- b. RESERVED
- c. RESERVED
- d. RESERVED
- e. AC adapter and cord for the RF Portable Data Collection Terminal.
- f. AC adapter and cord for the RF Bar Code Laser Scanner Terminal.
- g. Battery Charger/Discharger Unit for RF Portable Data Collection Terminal. The Battery Charger/Discharger unit shall be capable of charging batteries either in or out of the terminal. The unit shall be capable of discharging/charging the batteries when the batteries are removed from the terminal.
- h. Battery Charger/Discharger Unit for RF Bar Code Laser Scanner Terminal. The Battery Charger/Discharger unit shall be capable of charging batteries either in or out of the scanner terminal. The unit shall be capable of discharging/charging the batteries when the batteries are removed from the scanner terminal.
- i. Multiple Battery Charger/Discharger Unit for RF Portable Data Collection Terminal. The Multiple Battery Charger/Discharger unit shall be capable of charging at least 4 batteries simultaneously when they are removed from the PDCD. The Multiple Battery Charger/Discharger shall contain all necessary cables, power supplies and adapters to permit stand alone operation on a worldwide basis, as described in paragraph C.4.2.
- j. Multiple Battery Charger/Discharger Unit for RF Bar Code Laser Scanner Terminal. The Multiple Battery Charger/Discharger unit shall be capable of charging at least 4 batteries simultaneously when they are removed from the PDCD. The Multiple Battery Charger/Discharger shall contain all necessary cables, power supplies and adapters to permit stand alone operation on a worldwide basis, as described in paragraph C.4.2.

C.4.16.4 Consumable Supplies.

a. Rechargeable Batteries for RF Portable Data Collection Terminal.

b. Rechargeable Batteries for RF Bar Code Laser Scanner terminal.

C.4.17 PORTABLE VOICE DATA COLLECTION DEVICE.

C.4.17.1 General Requirements. The Contractor shall provide a commercial, off-the-shelf, Portable Voice Data Collection Device (PVDCD).

C.4.17.2 Functional Requirements. The Contractor shall provide a PVDCD together with the necessary software to provide the following characteristics: capable of uploading and downloading data to a personal computer (286 technology or later); capable of operation in warehouse and outdoor bulk-storage environments; capable of supporting continuous speech recognition; speech dependence (the operator will be required to "teach" the device to recognize his or her speech pattern); capable of storing multiple speech patterns and allowing the operator to select his or her speech pattern from a menu; capable of storing at least a 1000-word vocabulary for at least two persons; capable of supporting text-to-speech synthesis; solid-state design; capable of supporting hands-free operation; user-programmable.

C.4.17.3 Separately Orderable Components. The Contractor shall provide the following Separately Orderable Components:

a. AC adapter and cord.

b. Headset. This headset shall be identical to, and in addition to, the headset included in the basic configuration.

C.4.17.4 Consumable Supplies. Rechargeable batteries.

C.4.18 PERSONAL COMPUTER MEMORY CARD INTERNATIONAL ASSOCIATION (PCMCIA) PC MEMORY CARD.

C.4.18.1 General Requirements. The Contractor shall provide a Personal Computer Memory Card International Association (PCMCIA)-defined, Type I memory card that can support application requiring interchangeability with AT-compatible computers. The memory card shall conform to PCMCIA PC Card Standard, Release 2.0 or greater. Where a battery is required, no tools shall be required for insertion or removal of the battery. The memory cards shall use current, industry-accepted memory technologies. The PCMCIA PC memory cards shall support the five PCMCIA Metaformat Layers specified in the Card Standard.

C.4.18.2 Functional Requirements. The PCMCIA PC memory card shall be formatted for use with AT-compatible computers and to support data acquisition devices such as Portable Data Collection Devices (PDCDs). The memory card shall support four signal classifications: I(Input), O(Output), I/O(Bi-directional), and R(Reserved). The PCMCIA PC memory card shall have a disk-type format for file systems that allows data to be written, read, and erased. The data format on the card shall be transferrable to any AT-compatible PC or PDCD-

host file. The file system formats on the memory card shall support MS-DOS and non-MS-DOS operating systems that conform to the PCMCIA Standard. The following memory capacities shall be provided:

- a. 64 Kbyte PCMCIA PC Memory Card.
- b. 128 Kbyte PCMCIA PC Memory Card.
- c. 512 Kbyte PCMCIA PC Memory Card.
- d. 1 Mbyte PCMCIA PC Memory Card.
- e. 4 Mbyte PCMCIA PC Memory Card.
- f. 16 Mbyte PCMCIA PC Memory Card.

C.4.18.3 Separately Orderable Components. The Contractor shall provide a protective, rigid, plastic sleeve to ensure that damage cannot occur to the card during typical warehouse handling, transportation, or in an outdoor environment.

C.4.19 INTEGRATED CIRCUIT CARD (ICC).

C.4.19.1 General Requirements. The Contractor shall provide an Integrated Circuit Card (ICC) with a microprocessor (also known as a Smart Card) that complies with the ISO 7816 standard. The IC card shall be provided with an ANSI/ISO Standards, low coercivity, magnetic stripe configurations:

- a. two-track
- b. three-track

C.4.19.2 Functional Requirements. The ICC shall be capable of being used for applications such as storage, retrieval, and the processing of information for personnel, finance, food service eligibility and head-count (magnetic stripe), and medical transactions. The ICC shall have the capability to provide features such as user identification, password authentication, and data protection from fraudulent operations and unauthorized access. Some ICCs shall be provided containing text and logos using not more than two colors as determined by a user defined proof. The ICC shall be capable of being personalized on site with appropriate textural numeric, bar coded, embossed, and printed photographs. When a battery is required, no tools shall be required for insertion or removal of the battery. The ICC shall support application requiring interchangeability with AT-compatible computers and PDCDs. The following memory capacities shall be provided:

- a. 2 Kbyte Integrated Circuit Card.
- b. 8 Kbyte Integrated Circuit Card.

C.4.19.3 Separately Orderable Components. The Contractor shall provide a protective, rigid, plastic sleeve to ensure that damage cannot occur to the ICC during typical warehouse handling, transportation, or in an outdoor environment.

C.4.20 OPTICAL MEMORY CARD.

C.4.20.1 General Requirements. The physical attributes of the card shall protect the data on the card against loss from physical, electrical, magnetic, or other external forces. The card shall have a storage capacity of at least 2.86 Mbytes (with error detection and correction). The Contractor shall provide a protective, rigid, plastic sleeve to ensure that damage cannot occur to the card during typical warehouse handling, transportation, or in an outdoor environment.

C.4.20.2 Functional Requirements. The card shall serve as a portable data carrier and support applications requiring interface to AT-compatible computers and PDCDs. These applications may include, but are not limited to, shipping manifesting, recording supply and transportation information, forming a data base of unprocessed receipts at destination, and for expediting receipt processing.

C.4.21 PCMCIA PC MEMORY CARD READER/WRITER.

C.4.21.1 General Requirements. The Contractor shall provide three categories of PCMCIA PC Memory Card Reader/Writers: External PCMCIA PC Memory Card Reader/Writer; Internal PCMCIA PC Memory Card Reader/Writer; and, Internal PCMCIA PC/PDCD Reader/Writer. The PCMCIA PC/PDCD Reader/Writer is described in paragraph C.4.4. No damage shall occur to the media or the Reader/Writer when the card is removed before, during, or after reading or writing operations.

C.4.21.2 Functional Requirements. The Contractor shall provide three categories of PCMCIA PC Memory Card Reader/Writers, the last of which is described in paragraph C.4.4.

a. External PCMCIA PC Memory Card Reader/Writer. The External, PCMCIA PC Memory Card Reader/Writer is intended to be connected to AT-compatible computers and PDCDs via cable and break-out boxes, and contains all necessary electronics for formatting, reading and writing memory cards and passing information to and from the host system.

b. Internal PCMCIA PC Memory Card Reader/Writer. The Internal, PCMCIA PC Memory Card Reader/Writer is intended to be integrated into the host system as a half-height PC drive. The base I/O address shall be user selectable. The controller and drive shall require no internal power sources nor upgrades to the host power supply. The reader/writer shall come with the necessary software for installation, configuration, and normal operation. The drive unit shall allow for non-system (manual) removal of the card. These devices shall operate much the same as 5 1/4" and 3 1/2" disc drives.

c. PCMCIA PC/PDCD Memory Card Reader/Writer as described in paragraph C.4.4.

C.4.22 INTEGRATED CIRCUIT CARD (ICC) READER/WRITER.

C.4.22.1 General Requirements. The Contractor shall provide three categories of Integrated Circuit Card (ICC) Reader/Writers: External ICC Card Reader/Writer; Internal ICC Card Reader/Writer; and, and the

ICC/PDCD Reader/Writer described in paragraph C.4.4.

C.4.22.2 Functional Requirements. The three categories of ICC Card Reader/Writers shall support any ICC card application requiring interchangeability with AT-compatible computers and PDCDs. No damage shall occur to the ICC or the Reader/Writer when the card is removed before, during, or after reading/writing operations.

a. External ICC Reader/Writer. The External ICC Reader/Writer is intended to be connected to a host computer via cable and break-out boxes, and contains all necessary circuitry for formatting, reading, and writing to ICC cards, as well as for passing information to and from the host system.

b. Internal ICC Reader/Writer. The Internal ICC Reader/Writer is intended to be integrated into the host system as a half-height PC drive. The base I/O address shall be user selectable. The controller and drive shall require no internal power sources, nor upgrades to the host power supply. The ICC reader/writer shall come with the necessary software for installation, configuration, and normal operation. The drive unit shall allow for non-system (manual) removal of the card. These devices shall operate much the same as 5 1/4" and 3 1/2" disc drives.

c. ICC/PDCD Reader/Writer as described in paragraph C.4.4.

C.4.23 OPTICAL MEMORY CARD READER/WRITER.

C.4.23.1 General Requirements. The Contractor shall provide an Optical Memory Card Reader/Writer that can support any Optical Memory Card application requiring interchangeability with AT-compatible computers.

C.4.23.2 Functional Requirements. The Optical Memory Card Reader/Writer connectors shall be compatible with AT-compatible computers. No damage shall occur to the media or the Reader/Writer when the card is removed before, during, or after reading/writing operations. The Reader/Writer shall be designed for maximum ease of card insertion and removal. The Reader/Writer shall withstand those environmental conditions commonly encountered by ADP equipment in an office setting or light industrial environment. The Optical Memory Card Reader/ Writer shall be compact and fit on a desk top.

C.4.24 MAGNETIC STRIPE ENCODER

C.4.24.1 General Requirements. The Contractor shall provide a magnetic stripe encoder that can encode ANSI/ISO Standard two-track, low-coercivity, magnetic stripe cards.

C.4.24.2 Functional Requirements. The magnetic stripe encoder shall be a stand-alone encoder that shall also interface with AT compatible computers. Software shall be provided with the encoder that allows the user to encode magnetic tracks 1 and 2 with user-provided information using an AT-compatible computer.

C.4.25 MAGNETIC STRIPE READER

C.4.25.1 General Requirements. The Contractor shall provide two categories of magnetic stripe reader: a Keyboard Wedge Magnetic Stripe Reader, and the Magnetic Stripe/PDCD reader described in paragraph C.4.4.

C.4.25.2 Functional Requirements. The two categories of magnetic stripe readers shall support magnetic stripe card applications that require interface with AT-compatible computers and PDCDs.

a. Keyboard Wedge Magnetic Stripe Reader. The keyboard Wedge Magnetic Stripe Reader shall interface with an AT-compatible computer through the keyboard connection. The reader shall be capable of reading ANSI/ISO Standard magnetic tracks 1 and 2.

b. Magnetic Stripe/PDCD Reader. The Magnetic Stripe/PDCD Reader is described in paragraph C.4.4 and shall be capable of reading ANSI/ISO Standard magnetic tracks 1 and 2.

C.4.26 RUGGEDIZED TRANSIT CASE FOR TACTICAL EQUIPMENT

C.4.26.1 General Requirements. The Contractor shall provide reusable, ruggedized, waterproof, rigid transit cases to store and transport **tactical** AIT configurations by surface or air.

C.4.26.2 Groups. The Contractor shall provide various groups of **tactical** AIT components; a tactical portable data collection device transit case group, a tactical printer transit case group, an Optical Memory Card Reader/Writer transit case group, as well as groups to provide tactical RF spread-spectrum capability to a variety of different sized units. Each group shall contain all necessary adapters to permit operation on a worldwide basis as described in C.4.2. The Contractor shall request a National Stock Number (NSN) for each tactical transit case group by submitting a DD Form 61, Request For Nomenclature.

a. Tactical Portable Data Collection Device (PDCD) Transit Case Group. The Tactical PDCD Transit Case Group shall contain the following:

1. Intrinsically safe/industrially hardened PDCD, stored in a PDCD holster inside transit case cut-out. (C.4.4)

2. Hand-held, Non-contact, Intrinsically safe, Bar Code Scanner (BCS), stored in a BCS holster inside transit case cut-out, if the PDCD satisfying 1. above, is not a one-handed unit. (C.4.5)

3. End User Manual. (C.13)

4. Interface cable and manual break-out box (per paragraph C.4.3).

5. Batteries, operating and spare (1 set each). (C.4.1.1)

6. Battery charger/discharger unit. (C.4.4.4.e.)

7. AC adapter and cord. (C.4.1.2).

8. Power plug adapter, if required. (C.4.2).

9. Transit case. (C.4.26)

b. Tactical Printer Transit Case Group. The Tactical Printer Transit Case Group shall contain the following:

1. Type III Bar Code Label/Form Printer. (C.4.10.2.c.)
2. Operator's Maintenance Kit. (C.4.10.3)
3. End User Manual. (C.13)
4. Interface cable (10-foot) and manual break-out box (C.4.3).
5. Power cable. (C.4.2)
6. Power plug adapter, if required (C.4.2).
7. Ribbons, operational and spare (1 set each). (C.4.10.3)
8. Fuses, operating and spare (1 set each), where applicable. (C.4.2)
9. Transit case. (C.4.26)

c. Tactical RF Groups. The contractor shall provide four transit cases for the tactical RF Groups. Each transit case shall contain the applicable items as described below:

1. RF BCLST Transit Case. The RF BCLST transit case shall contain:

- (a) RF BCLST, spread-spectrum, in a holster inside the transit case cut-out. (5 EA) (C.4.16.2.c.)
- (b) Batteries, operating and spare (1 set EA)
- (c) Battery charger/discharger, multiple, (1 EA)
- (d) Battery charger/discharger, single, with interface (1 EA)
- (e) AC adapter and cord for RF BCLST (5 EA) (C.4.16.3.f.)
- (f) Interface cradle/charger, (5 EA)
- (g) Power plug adapter (5 EA) (C.4.2)
- (h) EUM (1 EA)
- (i) Transit case

2. Base Station Transit Case. The Base Station transit case shall contain the necessary items for the Base Station to operate correctly. The Base Station Transit Case shall contain:

- (a) RF Transceiver Unit (1 EA) (C.4.16.2.d.)
- (C.4.16.2.e.) (b) RF Communication Controller (1 EA)
- (c) RF Repeater. (1 EA) (C.4.16.2.f.)
- (d) Power plug adapters (C.4.2)
- (C.4.2) (e) Fuses, operating and spare (1 set each)
- (f) 200 foot transceiver-to-controller cable. (1 EA)
- (g) Antenna (1 EA)
- (h) RG/8 Coax Antenna Cable with lightning arrester, 40 FT
- (i) Connectors for the antenna cable and lightning arrester.
- (j) Interface cable.
- (k) EUM (1 EA) (C.13)
- (l) Transit Case (1 EA)

3. Type I Portable Printer. The Type I Portable Printer transit case shall contain:

- (C.4.10.2.a.) (a) Type I Bar Code Label/Form Printer (3 EA)
- (b) Printer Carrying Strap (C.4.10.4.a.) (3 EA)
- (C.4.1.1) (c) Batteries, operating and spare (1 set each).
- (C.4.10.4.f.) (d) Battery charger/discharger unit. (3 EA)
- (e) Interface cable (3 EA)
- (f) EUM (1 EA)
- (g) Transit case (1 EA)

4. Type I Portable Printer Accessories. The Type I Portable Printer Accessories transit case shall contain:

- (a) Battery Charger/Discharger (3 EA)
- (b) AC adapter and cord for portable printer (3 EA) (C.4.10.4.g.)

(c) Power plug adapter, if required. (C.4.2)

(d) Thermal Transfer Media Package (The package shall consists of 1 Roll EA of thermal transfer ribbon and 6 rolls EA of label material.) (3 sets each).

d. Tactical Optical Memory Card Reader/Writer Group. The tactical Optical Memory Card Reader/Writer Group will include any transformers/adapters required to operate the Reader/Writer on both 120 and 220 volt and 50/60 hertz. The tactical Optical Memory Card Reader/Writer Group will include the following:

1. Optical Memory Card Reader/Writer (C.4.23) inside transit case cut-out.
2. End User Manual (C.13).
3. Power plug adapters. (C.4.2).
4. Fuses, operating and spare (1 set each). (C.4.2)
5. Transit Case. (C.4.26)

C.4.26.3 Transit Case Requirements and Testing. Each version of the complete transit case groups shall undergo First Article Test in accordance with MIL-C-4150J and MIL-STD-810D, and meet additional requirements specified below. Engineering drawings, Acceptance Test Procedures, and Test Reports shall be submitted in accordance with the Contract Data Requirements Lists (CDRLs) A001, A002 and A003, respectively. The First Article Test under MIL-C-4150J may be waived if the Contractor provides adequate evidence that the transit case has previously passed the First Article Test and has been accepted by the Government. The First Article Test under MIL-STD-810D is stipulated in paragraph h. below.

a. Contents. The Contractor shall provide a transit case that contains cut-outs or molded cushioning to protect its contents from damage during storage and transit. Inserts shall be split to be an integral part of the top and bottom of the transit case. Cushioning material used for cut-outs or molded compartments shall be permanent and reusable, and to the maximum extent possible, attached to the cases.

b. Inventory List. Each tactical AIT transit case shall have a durable and permanent inventory list of all items in the group. Graphic packing instructions shall be affixed to the inside of the top cover and visible to the user.

c. Protection. Transit cases shall protect equipment from a spectrum of environmental conditions which include, but are not limited to, vibration and shock, direct sunlight, rain, salt, fog, and humidity.

d. Type. Transit cases shall be Type I, Water Vapor proof and Class A for a maximum gross weight of 150 pounds. Each case shall be Style I, as defined in MIL-C-4150J, and with a non-hinged closure.

e. Dimensions. The Contractor shall minimize the weight and size of the transit case with its contents. The interior and exterior dimensions of the transit case shall be dependent upon the Contractor-provided transit case arrangement, and physical dimensions of components and support items. In any case, the transit case shall not exceed the following exterior dimensions: 30 inches in width, 30 inches in length, and 30 inches in height.

f. Handles and Clasps. Handles shall return to a closed position by a spring-loaded mechanism or a simple restraining mechanism when not in use. Clasps shall be easily accessible and operable by personnel utilizing Mission Oriented Protective Posture (MOPP) Gear or wearing low-temperature, protective gloves.

g. Attributes. Automatic pressure-vacuum relief valves shall accommodate differences in pressure from sea level up to an altitude of 40,000 feet. Security access seals, and a humidity indicator facility and plug, are not required. Color shall be in accordance with MIL-C-46168.

h. MIL-STD-810D Testing. The MIL-STD-810D specifications that the transit case (empty and complete with equipment) needs to pass is outlined below.

1. The empty transit case shall be tested in accordance with the specific sections of MIL-STD-810D stated below. However, the First Article Test for the following tests may be waived if the Contractor provides adequate evidence that the transit case has previously passed the First Article Test and accepted by the Government.

- |     |                              |              |
|-----|------------------------------|--------------|
| (a) | Rain                         | Method 506.2 |
| (b) | Salt Fog                     | Method 509.2 |
| (c) | Humidity                     | Method 507.2 |
| (d) | Sunshine                     | Method 505.2 |
| (e) | Dust                         | Method 510.2 |
|     | . Procedure I - Blowing dust |              |
| (g) | High Temperature             | Method 501.2 |
| (h) | Low Temperature              | Method 502.2 |

2. The transit case with the components configurations stored in the respective transit case shall be tested in accordance with the following sections of MIL-STD-810D to ensure each transit case protects the enclosed equipment. The First Article Test may be waived if the Contractor previously passed a First Article Test with the aforementioned components configurations specified in paragraphs C.4.26.2.a. and b. above.

- |     |                                      |              |
|-----|--------------------------------------|--------------|
| (a) | Vibration                            | Method 514.3 |
|     | . Category 1 - Basic Transportation  |              |
|     | . Category 3 - Loose Cargo Transport |              |
| (b) | Shock                                | Method 516.3 |
|     | . Procedure IV - Transit Drop        |              |

C.4.26.4 Identification Plate. Identification plate drawings shall be provided to the Contracting Officer's Representative (COR) for approval prior to commencement of manufacture of plates and

assignment of serial numbers as part of the Special Provisioning and Technical Documentation submission. Marking requirements specified below shall be in accordance with MIL-STD-130G and applicable references. (See Attachment 4.)

a. Required Information. Minimum required information shall be the Contract Number, Contractor And Government Entity (CAGE) Code, NSN of the group, approved Government Nomenclature and Type Designation, Serial Number, and Government ownership designation of U.S. The CAGE, NSN, and Serial Number of the group shall be bar coded on the nameplate.

b. Location. Identification plates on transit cases shall be located at the left or center of the exterior, vertical surface facing the operator when the case is ready to be opened. Location of identification plates shall be consistent for all transit cases. Each case shall also have stenciled nomenclature (black enamel) on the top and the four sides, identifying the major component of the transit case group.

c. Material and Adhesive. Identification plate material and adhesive shall be in accordance with MIL-P-19834B, Type 2, Style III, non-specular, and in accordance with MIL-P-15024D regarding format, spacings, and block headings.

#### C.4.27 CARD PERSONALIZATION SYSTEM

C.4.27.1 General Requirements. A card personalization system is a collection of hardware and software components that provide capability to personalize Integrated Circuit Chip (ICC) and/or magnetic stripe cards through application of printed text, logos, and photos. The card personalization system shall consist of four components: user-configurable software to control the personalization process, a digital video camera system, a card printer, and video capture PC based boards. The card personalization system must be capable of printing on standard sized cards, and must support embossing, magnetic stripe reader/writers, ICC reader/writers and bar code devices. The card personalization system will support the capture, digitization, printing, storage, and retrieval of photographs of the card holder. The system will support embossing of the cards through use of appropriate peripheral equipment. Printing on the cards will include capabilities for user-defined fields of textual, numeric, and bar-coded data, logos and other user-definable emblems, and the digitized photograph. The system will support reading and writing to the magnetic stripe and the ICC.

C.4.27.2 Functional Requirements. The card personalization system must be sufficiently versatile to support personalization of cards in real time or through batch processing. Data for card personalization may be obtained from keyboard entry, floppy or hard disk access; remote system database access; reading bar coded, magnetic stripe, or ICC data; and any combination thereof. The system will be capable of storing all data associated with personalizing a card, to include the digitized photo. The system must be capable of supporting user-defined card formats, data elements, data entry fields, and logos and other emblems in commonly used PC graphics formats. The camera used in the system must be capable of digitized photo capture and will be stabilized through the use of a tripod or other similar

device. A light for use in situations where ambient light is insufficient will be provided. The system will include the necessary hardware and software components to capture, digitize, print, store, and retrieve the photo of the card holder. The camera must be capable of printing text, numeric, bar coded, photographic and graphic data with at least 240 dots per inch resolution. The system will support interfaces with peripheral devices used to read or write to the magnetic stripe, ICC, or PCMCIA cards, emboss data on the card, and print text, numbers, bar codes, logos, and photos.

The card personalization system must be capable of operating in any environment suitable for use with a personal computer.

- C.4.27.3 Interfaces. The card personalization system interfaces with the following peripheral devices: bar code scanners or readers, ICC readers/writers; magnetic stripe readers/writers; embossers; card printers; page printers; and PCMCIA PC memory card reader/writers. The card personalization system must be capable of accepting data from a bar code, magnetic stripe, ICC, or PCMCIA reader, floppy disk; or from a remote database system. The system must support writing to a magnetic stripe, ICC, PCMCIA card, or floppy disk, and printing text, numerals, bar codes, photographs, and logos.
- C.4.27.4 Separately Orderable Components. The following separately orderable components shall be available for the card personalization system:
- a. Replacement Printhead
  - b. Replacement Card Cleaning Roller
- C.4.27.5 RESERVED.
- C.4.28 EMOSSER.
- C.4.28.1 General Requirements. The Contractor shall provide a table-top embosser capable of on-line or off-line embossing of ICC and magnetic stripe cards. The embosser will be capable of encoding magnetic stripes and ICCs prior to embossing and color topping the embossed characters.
- C.4.28.2 Functional Requirements. The embosser will typically be used in conjunction with the card personalization system to emboss characters on an ICC or magnetic stripe card at the time of personalization. The embosser must be capable of embossing text and numbers on the card in user-definable locations. The embosser will be capable of being connected to a PC or stand-alone keyboard/CRT with formatting software. The embosser shall be capable of supporting in-line encoding of three track magnetic stripes. A data conversion utility will be provided in that case to allow the embosser to distinguish between data to be encoded and embossed. Embossed characters will be capable of being color topped. The embosser shall operate at standard speed and be capable of manual card feeding.
- C.4.28.3 Separately Orderable Components. The Contractor shall provide the following separately orderable components for the embosser:
- a. In-line 3-track magnetic stripe encoder with data conversion utility.

b. Color Topper with output tray.

C.4.28.4 RESERVED.

C.5 SOFTWARE REQUIREMENTS

AIT software is comprised of applications software, diagnostic software, and system utilities. Software shall be capable of being installed on PC-based hosts with minimal degradation in equipment performance. Each provided program shall run under MS-DOS 5.0 or Microsoft WINDOWS 3.0, or later. The PDCD operating system shall be MS-DOS 5.0, or later.

C.5.1 BAR CODE LABEL/FORM GENERATION SOFTWARE. Bar Code Label/Form Generation and Printing Software is a set of programs in one package that will allow the Government user to design and print bar code labels and forms for use on DOS-based systems, except the PDCDs. The software shall be capable of generating low, medium, high, and ultra-high Code 39 bar codes, as well as the other bar codes listed in paragraph C.2.2. The software shall be also capable of generating DD 1348-1 and DD 1387 forms. The software shall be designed to drive the Contractor-provided Types II, III, and IV printers. The Contractor shall provide software that allows rapid label and form design without having to learn the complexities of bar code symbologies and printer control languages, displays a "what-you-see-is-what-you-get" (WYSIWYG) editor for designing bar code labels and forms, and allows viewing of labels and forms prior to printing. The software shall also permit the use of fixed or variable data for label/form text and bar codes, and shall import information to be used with labels and forms from data bases. Contractor-provided Bar Code Label/Form Generation and Printing Software shall be capable of running under MS-DOS 5.0 or Microsoft WINDOWS version 3.0 or later. No custom programming shall be required for use.

C.5.2 BAR CODE APPLICATION GENERATION SOFTWARE. The Bar Code Application Generation Software shall reside on AT-compatible hosts running MS-DOS 5.0 and Windows 3.1 or higher. The application generator shall provide an enhanced user interface and style that shall allow for rapid software development by non-programmer users. The application generator shall produce code that can be executed and debugged on a PC. The execution of this code on the PC shall provide a WYSIWYG (what-you-see-is-what-you-get) representation of what will be seen when executing on the PDCD (which is running DOS, not Windows 3.1 ). The application generator shall produce source code in ANSI "C", BASIC and executable object code for the PDCD. The application generator shall allow for calls or "hooks" into the source output.

C.5.3 COMPILER LANGUAGES.

C.5.3.1 ANSI "C" Compiler. An ANSI "C" compiler shall be provided that allows for development, execution, and de-bugging of the user-developed program prior to download to the PDCD. The compiler shall include all necessary libraries to allow for calls activating full functionality of the PDCD. Such libraries shall also be available as a Separately Orderable Component, recognizing that they will only

work on the provided compiler. Provisions shall be made to permit downloading executable code to a PDCD.

- C.5.3.2 BASIC Compiler. A BASIC compiler shall be provided that allows for development, execution, and de-bugging of the user-developed program prior to download to the PDCD. The compiler shall include all necessary libraries to allow for calls activating full functionality of the PDCD. Such libraries shall also be available as a Separately Orderable Component, recognizing that they will only work on the provided compiler. Provisions shall be made to permit downloading executable code to a PDCD.
- C.5.3.3 Ada Compiler. An Ada compiler shall be provided that allows for development, execution, and de-bugging of the user-developed program prior to download to the PDCD. The compiler shall include all necessary libraries to allow for calls activating full functionality of the PDCD. Such libraries shall also be available as a Separately Orderable Component, recognizing that they will only work on the provided compiler. Provisions shall be made to permit downloading executable code to a PDCD.

#### C.6 FIRMWARE REQUIREMENTS

The Contractor shall provide necessary firmware as part of the hardware configuration of AIT components. Firmware shall reflect the baseline configuration and all subsequent Government-approved ECs. All firmware available to the operator shall be selectable by dip-switch or software. All firmware shall be installed prior to hardware delivery.

#### C.7 MANAGEMENT

- C.7.1 AIT PROGRAM MANAGEMENT. The minimum management types of activities considered necessary to assure adequate control of the AIT program and respond to Government requirements include the following: providing immediate and sustained response to Government requirements for support; processing customer orders for AIT equipment and technical services, developing and maintaining the Ordering Guide, coordinating AIT equipment shipments and deliveries, and reporting order and delivery status; establishing and operating the requisite Maintenance Repair Centers (MRCs); performing the necessary maintenance operations for AIT hardware furnished under this contract; preparing associated maintenance records, and submitting monthly status reports; developing and implementing the Configuration Management Plan; establishing and maintaining effective coordination with the various Services/Agencies supported by this contract; supporting scheduled project reviews and conferences; and managing the activities of sub-contractors.
- C.7.2 POINTS OF CONTACT. The contractor shall provide a list of points of contact within ten days after contract award. The list shall include names, telephone numbers, areas of responsibility for the contract, and addresses.
- C.7.3 MANAGEMENT PLAN. The contract shall be managed in accordance with the Management Plan at time of contract award or as mutually agreed upon after contract award.

- C.7.4 PROJECT PROGRESS REVIEWS (PPR). The Contractor shall conduct PPRs for Government personnel at a Government facility. PPRs shall occur on a monthly basis for the first 12 months of the contract, and quarterly thereafter, for the life of the contract. During each review, the Contractor shall present material that addresses technical status, schedules, problems, and other significant activities. The Contractor shall include in each review, a current organizational chart that includes the names and telephone numbers of all key personnel, and any key personnel changes. The Contractor shall conduct the initial PPR no later than 15 days after the initial delivery order is issued. The Contractor shall prepare and submit agenda for all PPRs in accordance with DI-A-7088 and CDRL A004. The Contractor shall prepare and submit minutes of the PPRs in accordance with DI-A-7089 and CDRL A005.
- C.7.5 PROJECT STATUS REPORT. The Contractor shall prepare and submit monthly Project Status Reports in accordance with CDRL A006. Delivery Schedule Report, CDRL A007, and Contract Data Status Reports, CDRL A008, shall be included as attachments to the Project Status Report.
- C.7.6 CONFIGURATION CONTROL. The Contractor shall establish formal configuration controls at the time the first delivery order is issued. The transit case group shall be verified by First Article Test.
- C.7.6.1 Configuration Management. AIT equipment shall be configuration controlled, accounted, and audited in accordance with the Government-approved Configuration Management Plan, DoD-STD-480, and applicable portions of DoD-D-1000 and DA PAM 25-6.
- C.7.6.2 Changes and Modifications. The Contractor shall notify the Contracting Officer of all Class I and II changes.
- C.7.6.3 Control Level. AIT equipment configuration management under Government control shall be at the electronic input/output port (mechanical/electrical), man-machine interface level, and for components and assemblies replaced or repaired by the Government.
- C.7.7 CONFIGURATION MANAGEMENT PLAN. The Contractor shall provide a Configuration Management Plan to the COR in accordance with CDRL A009. AIT equipment and software shall be controlled in accordance with the Government-approved Plan.
- C.8 MAINTENANCE
- The Contractor shall perform all maintenance to AIT components as ordered. Maintenance may be conducted at the Government site or at one of the Contractor's Maintenance Repair Centers (MRCs) for tactical and non-tactical provided AIT equipment. The Contractor shall provide the warranties specified in Section B for all provided AIT equipment, in accordance with the warranty clause in Section I and in accordance with the Maintenance Section, C.8. If there is a conflict between the FAR Clause, 52.246-17, "Warranty of Supplies of a Noncomplex Nature," and this section, the FAR clause shall govern.
- C.8.1 DEFINITIONS.

C.8.1.1 Principle Period of Maintenance (PPM).

PPM is the remedial (corrective) and preventive maintenance on hardware that is performed by the Contractor during the official hours of operation of the Government for the equipment listed in C.8.2.1. The Contractor's facility shall be staffed during this block of time and prepared to accept carry-in/mail-in AIT components for maintenance.

C.8.1.2 Outside Principle Period Of Maintenance (OPPM).

OPPM is the period of remedial maintenance on hardware that is performed by the contractor, outside the official hours of operation of the Government. The OPPM for maintenance shall be between the hours of 5:00 PM and 8:00 AM the next business day. OPPM shall be performed in conjunction with On-Call and Per-Incident Maintenance.

C.8.1.3 Maintenance Repair Centers (MRC) Hours of Operations.

Each MRC shall be operational for a nine hour block between the hours of 8:00 AM through 5:00 PM, local time, Monday through Friday, excluding Federal holidays.

C.8.1.4 Official Hours of Operation.

Official hours of operation are from 8:00 AM to 5:00 PM, local time, Monday through Friday, of each Government facility.

C.8.1.5 AIT Equipment.

The AIT tactical equipment is as described in C.4.26. All other AIT equipment is non-tactical.

C.8.1.6 Preventative Maintenance.

Preventative Maintenance includes all actions performed in an attempt to retain an item in a specified condition by providing systematic inspection, detection and prevention of incipient failures.

a. Tactical AIT. Operators of tactical AIT equipment will perform only operator/crew maintenance tasks identified in the Maintenance Allocation Chart (MAC). The MAC is described in this section. These tasks will be confined to Preventive Maintenance Checks and Services (PMCS), and troubleshooting using operator level diagnostics. The Contractor shall perform any maintenance function or task not specifically identified in the MAC as operator/crew.

b. Non-tactical AIT. Operators of non-tactical AIT components will only perform preventative maintenance actions identified in the appropriate commercial operator manuals. The Contractor shall be responsible for all other maintenance and support.

C.8.2 MAINTENANCE SUPPORT.

The Contractor shall provide On-Call, Per-incident and Mail-in\Carry-in maintenance, establish MRCs which will support all

maintenance of AIT equipment, and provide technical support in accordance with this section.

C.8.2.1 On-Call Maintenance.

a. The Contractor shall provide worldwide On-call maintenance for AIT hardware specified below. On-call maintenance shall be charged on a monthly, fixed-price basis for remedial and preventive maintenance during the PPM. The Contractor shall provide OPPM whenever required by the using activity who has ordered on-call maintenance. Preventative maintenance shall be performed in accordance with the schedule mutually acceptable to the Government and Contractor.

1. Point-of-Sale Scanners. (C.4.6)
2. Connectivity Devices. (C.4.14)
3. RF Data Communications Systems. (C.4.16)

b. Remedial maintenance of the above equipment at Government-designated locations shall be completed within twelve (12) hours after notification by the Government.

c. The Contractor shall provide the Government with points of contact, associated telephone numbers and addresses.

d. All parts and labor shall be included in the pricing for On-Call maintenance and OPPM.

e. Any travel and per diem related to On-call maintenance will be reimbursed based on the rate from the nearest MRC in accordance with the Federal Joint Travel Regulations (JTR).

C.8.2.2 Per-Incident Maintenance.

a. The Contractor shall provide worldwide per-incident maintenance for the AIT hardware specified in paragraph a. of C.8.2.1, On-Call Maintenance. Per-incident maintenance shall be charged on a per-incident, fixed-price basis for remedial and preventative maintenance during the official hours of operation. The Contractor shall provide OPPM whenever required by the using activity who has ordered per-incident maintenance.

b. Remedial maintenance of the above equipment at Government-designated locations shall be completed within 12 hours after notification by the Government.

c. The Contractor shall provide the Government with points of contact, associated telephone numbers and addresses.

d. Pricing of the per-incident maintenance shall include parts and labor.

e. Any travel and per diem related to per-incident maintenance will be reimbursed based on the rate from the nearest MRC in accordance with the Federal JTR.

f. If it is determined that the item is unserviceable, then the Contractor shall replace the unserviceable item with a serviceable item of same or like equipment, unless determined to be unserviceable due to user's negligence.

C.8.2.3 Mail-in/Carry-in Maintenance.

a. Maintenance Procedures.

1. The Contractor shall provide worldwide mail-in/carry-in maintenance for both tactical and non-tactical AIT equipment charged on an per-incident, or monthly fixed-price basis.

The Contractor shall maintain hardware delivered under this contract by repairing or replacing failed parts or components, at the nearest Contractor's MRC.

2. A Return Material Authorization (RMA) number shall be provided prior to the Government mailing in or carrying in the failed equipment to the nearest MRC for repair or replacement. All failed equipment returned to the MRC will be identified by the RMA number. This RMA requirement may be waived during military contingencies, only for those items which are actually used in the contingency.

3. After receipt of the item, the Contractor shall repair the item. If it is determined that the item is unserviceable, then the Contractor shall replace the unserviceable item with a serviceable item of same or like equipment, unless determined to be unserviceable due to user's negligence.. The Contractor shall effect return of the repaired or replaced item within two working days to the user.

4. The Contractor shall notify the user of the receipt, any noted discrepancies between the equipment received and the order, and of the availability of the repaired equipment for pickup or shipment in accordance with the instructions provided by the user.

5. The Contractor shall annotate any shortages discovered during inventory of the equipment received by the contractor for maintenance on the maintenance request or work order in order to provide written notice to the Government.

6. Pricing of mail-in/carry-in shall include parts and labor.

b. Transportation. Transportation for the failed AIT equipment to the contractor's MRC for both tactical and non-tactical AIT components is as follows:

1. Tactical.

(a) PDCD, Optical Memory Card Reader/Writer and Printer Configurations. Transportation will be arranged and paid for by the Government for both to and from MRC. Failed AIT equipment, along with all components that compose the transit case group, will be packed in its original transit case and forwarded to the nearest MRC for repair or replacement. For other than

Government carry-in and pickup at the Contractor's facility, the Government will provide the Contractor with transportation instructions, including a Government Bill of Lading (GBL), pre-addressed envelope to the Government Transportation Management Office, and shipping labels enclosed in the transit case for return shipment after repair. The Contractor shall return the serviced equipment with transit case group to the user after completion of the repair or replacement.

(b) RF Configuration. Transportation will be arranged and paid for by the Government for both to and from MRC. For other than Government carry-in and pickup at the Contractor's facility, the Government will provide the Contractor with transportation instructions, including a Government Bill of Lading (GBL), pre-addressed envelope to the Government Transportation Management Office, and shipping labels enclosed in the transit case for return shipment after repair. Packaging will be accomplished in accordance with standard practice in order to avoid further damage to the equipment.

2. Non-tactical. Transportation of the failed AIT equipment to the Contractor's facility will be arranged and paid for by the Government for both mail-in/carry-in. Return transportation of the serviced equipment to the user shall be arranged and paid for by the Contractor. The Contractor shall use a shipping method equal to or better than the user's method of shipment. Packaging will be accomplished in accordance with standard practice in order to avoid further damage to the equipment.

#### C.8.2.4 Maintenance Repair Centers (MRCs).

a. The Contractor shall establish the following MRC facilities no later than 90 days after first delivery order is issued in the area of the responsible MRC in order to repair/replace all failed AIT equipment, and provide on-call, per-incident and mail-in/carry-in maintenance, and provide technical assistance to users of AIT equipment.

1. Continental United States (CONUS) MRCs. The Contractor shall provide a minimum of two CONUS MRCs to support CONUS-based AIT configurations. The Contractor shall designate the boundary between the areas serviced by the MRCs in order to minimize shipping times/costs. The MRCs shall perform technical support and maintenance functions in accordance with this section.

2. Outside Continental United States (OCONUS) MRCs. The Contractor shall provide MRCs in the OCONUS geographic areas below. These MRCs shall be responsible for technical support and maintenance functions for their assigned regions, in the same manner as the CONUS MRCs. OCONUS MRCs shall, as a minimum, be established in the following locations:

- (a) Germany (Europe).
- (b) Hawaii.
- (c) Italy (Mediterranean).

(d) Korea.

(e) Japan.

b. The Contractor shall provide the Government with the point of contact, telephone numbers and addresses for each MRC. The Contractor shall provide any updates to the Government as changes occur.

C.8.2.5 Contingency Operations Maintenance.

a. In case of contingency operations, the Contractor shall provide personnel, tools and a spares kit to support the AIT equipment for both tactical and non-tactical AIT components either by establishing a separate MRC or expanding an existing MRC.

b. If a separate MRC needs to be established, then the Government may provide the facility. All maintenance during the contingency operations shall be the same as stated previously. When on-call maintenance is required, the Government will provide transportation to the equipment. The deployments will be for a minimum of 180 days, extendable for up to three 30-day periods. The Contractor shall be available for deployment within 30 days from notification by the Government.

c. If the deployment results in additional cost incurred by the Contractor, then the Contracting Officer will consider the cost and negotiate an equitable adjustment in accordance with FAR Clause 52.243-1, Changes-Fixed Price, Alternate I.

C.8.2.6 Technical Assistance.

a. The technical assistance shall include Contractor's personnel assisting in troubleshooting and correcting hardware and software problems; receiving on-call maintenance requests; and receiving requests for an RMA for mail-in/carry-in maintenance. All of the telecommunication vehicles described below shall be provided to support these requirements unless otherwise stated.

1. The Contractor shall provide within the Continental U.S. a toll-free "Hot Line" technical support for AIT users worldwide. The "Hot Line" shall be staffed 24 hours, 7 days per week.

2. The Contractor shall provide a telephone assistance number at each MRC (CONUS and OCONUS) to be staffed during the operating hours of each respective MRC.

3. The Contractor shall establish and maintain an electronic bulletin board for Government operators worldwide. The electronic bulletin board, in addition to paragraph (a) above will be used for the exchange of information between the Contractor and individual users and groups. The bulletin board will not be used to request On-Call or Per-Incident maintenance as described in C.8.2.1 and C.8.2.2.

b. Contractor's personnel manning the "Hot Line" and the telephone assistance numbers shall have sufficient expertise to

recommend corrective actions for the hardware and software problems; and speak and understand English.

C.8.3 SUPPLY SUPPORT.

Only new standard parts or parts warranted as equal in performance to new parts shall be used in effecting repairs. Unserviceable parts or components that have been replaced shall become the property of the Contractor.

C.8.4 MAINTENANCE DOCUMENTATION.

C.8.4.1 Maintenance Allocation Chart (MAC) (CDRL A010).

The Contractor shall prepare a MAC in accordance with MIL-M-63038C for all AIT equipment as listed in paragraph C.4.26 to be deployed in a tactical environment. The MAC will identify the maintenance functions that must be performed; the lowest level authorized to perform each task; the active repair time, and tools and test equipment necessary to perform the function for each reparable assembly. The MAC shall include coverage of all operator/crew tasks and shall show assignment of all higher level tasks to Depot. The MAC shall be provided as a supplement to the tactical AIT End User Manual (EUM). Preparation instructions and format for the MAC are provided in MIL-M-63038C.

C.8.4.2 Monthly Maintenance Report.

The Contractor shall provide a consolidated worldwide monthly maintenance report. The maintenance reports shall be provided in accordance with CDRL A011. The reports shall include a separate line item of description for each maintenance incident and shall include the following:

a. Identity of the point of contact and location of the Government site requiring maintenance; type of maintenance; name of the Field Engineer (FE) performing the repair; and the location of the maintenance facility providing the service.

b. Identify whether the equipment is tactical or non-tactical.

c. Nomenclature, NSN and Part Number, CLIN, serial number, and quantity of each type of component repaired or replaced, and a brief non-technical description of the fault and repair action accomplished.

d. Date and time of the request for assistance, RMA number, name and location of the Government caller.

e. Date and time of the FE's arrival on site, or receipt at the maintenance facility.

f. Date and time the repair action was completed, or the equipment was mailed to using activity.

g. Category of action (i.e., Preventive, Remedial, Warranty).

h. A remarks section to provide information outside of the basic data (i.e., problems detected, problems corrected, and problems identified, but the cause not isolated, etc.).

C.8.5 MAINTENANCE PERSONNEL EXPERIENCE.

The Contractor shall provide maintenance personnel who have maintenance experience on AIT equipment. The experience of the maintainers shall have been obtained prior to assignment to the AIT configurations under this contract. The pool of maintainers shall have a mix of automatic data processing equipment and communications sub-system maintenance experience, to include AIT components, as specified in this document. All Contractor personnel providing assistance shall speak and understand English.

C.9 TECHNICAL ENGINEERING SERVICES.

C.9.1 GENERAL. The Contractor shall provide on-site technical engineering services at various Government sites worldwide. Technical engineering services shall include those services required for AIT component integration, site analysis, installation, deinstallation, relocation, and problem-solving, including software, communications, interfaces with other Government systems, hardware engineering services, and assistance in obtaining host-nation certification of communications equipment, if needed. Any cables not listed in the contract, or items/materials required for installation, may be ordered through this contract in accordance with Clause, Other Direct Costs, Section H.

C.9.2 SOFTWARE DEVELOPMENT SERVICES. AIT software development services shall be limited to 10,000 lines of code per application, include new development, and translation from existing LOGMARS applications from TCAL , UBASIC , and IRL proprietary languages to MS-DOS -BASED ANSI "C", BASIC , or Ada. For purposes of this contract a line of code is one computer instruction written by a programmer on one line of 80 characters or less. Assistance and information shall be provided relative to the capabilities and constraints of the hardware, firmware, or software delivered under this contract.

C.9.3 INSTALLATION/DEINSTALLATION/RELOCATION.

C.9.3.1 Installation/Deinstallation. The Contractor shall provide all necessary cables for the interface of the various components comprising an installation/deinstallation including the component itself, the host computer, peripheral devices, and power sources.

C.9.3.2 Pre-installation Survey. The Contractor shall conduct a pre-installation survey at each site requiring installation services to ensure that the necessary communications lines, electrical power, and space are available for the equipment installation. In some cases, a telephone survey may be sufficient but shall be authorized by the COR prior to conducting such a survey.

C.9.3.3 Relocation of AIT Equipment. The Contractor shall accomplish ordered relocations of AIT equipment (Point-of-sale Scanners, Connectivity Devices, and RFDC equipment) required after initial equipment installation. Some of the services to be provided, although not all inclusive, are stated in the clause "Movement of

Equipment," Section H. Additionally, the Contractor shall work at different geographic locations and perform physical movement of equipment.

C.9.3.4 Installation Plan. The Contractor shall provide an Installation Plan that shall include the means, methods, and time to accomplish AIT installations procured under this contract and in accordance with CDRL A012. The Contractor's Installation Plan shall include specific details on the methodology for installation of AIT hardware for the following devices: Point-of-Sale Scanners, Connectivity Devices and RF Data Communication Systems. The Installation Plan shall also include the Contractor's approach to accomplishing any AIT equipment moves that may be required after initial installation.

C.9.4 CONTRACT SUPPORT PERSONNEL. The Contractor shall provide highly skilled personnel with in-depth knowledge of the Contractor supplied hardware and software products. All personnel performing on this contract shall meet the minimum qualifications for the specified contract category described herein. Resumes of personnel shall be submitted to the Contracting Officer of each delivery order for approval. The Contracting Officer reserves the right to review and approve all resumes prior to the contractor's final commitment for assignment.

a. Project Manager. The Project Manager shall serve as the Manager of delivery orders and shall be the Contractor's authorized point-of-contact with the Government Contracting Officer, the COR, and point of contact for the delivery order. The Project Manager shall be responsible for formulating and enforcing work standards, assigning schedules, and reviewing work discrepancies, communicating policies, purposes, and goals of the organization to subordinates for each project. The Project Manager shall be available to manage delivery order performance and shall not serve in any other capacity under this contract. The Project Manager shall possess at least a bachelor's degree from an accredited college or university, or equivalent experience, as approved by the Contracting Officer of each order, in a field pertinent to the sphere of responsibility, and have a minimum of eight years progressive experience in systems design, development, and implementation of projects. The Project Manager shall possess demonstrated technical and managerial skills, and have experience with data base management systems and associated systems development tools.

b. Systems Analyst. The Systems Analyst shall possess at least a Bachelor's degree from an accredited college or university, or equivalent experience as approved by the Contracting Officer of each order, in a field pertinent to the sphere of responsibility, and have a minimum of eight years progressive experience in systems design, development, and implementation of projects. The Systems Analyst shall possess demonstrated technical and analytical skills. The Systems Analyst shall have experience analyzing systems and identifying project objectives, as well as identifying data elements, and preparing high level flow-charts and diagrams from which detailed program design may be further developed. The Systems Analyst shall work closely with the Project Manager, where applicable, to analyze requirements, and provide design data to the technical staff.

c. Software Systems Designer. The Software Systems Designer shall possess at least a Bachelor's degree from an accredited college or university, or equivalent experience, as approved by the Contracting Officer of each order, in a field pertinent to the sphere of responsibility, and have a minimum of seven years progressive experience in programming design, development, and implementation. The Software Systems Designer shall possess highly developed data analysis skills and be able to coordinate the efforts of other data analysts. The Software Systems Designer shall have experience with data base management systems, associated data analysis and design, and data dictionary tools, as well as distributed systems and data base development methods and techniques.

d. Senior Programmer. The Senior Programmer shall possess at least a Bachelor's degree from an accredited college or university, or equivalent experience, as approved by the Contracting Officer of each order, in a field pertinent to the sphere of responsibility and have a minimum of five years progressive experience in programming, design, development and implementation. The Senior Programmer shall possess highly developed data analysis skills and be able to coordinate with the efforts of other data analysts. The Senior Programmer shall be responsible for providing systems programming support for a variety of task orders.

e. Junior Programmer. The Junior Programmer shall have a minimum of three years of progressive experience in programming, design development, and implementation. The Junior Programmer shall possess data analysis skills and be able to coordinate the efforts of other data analysts. The Junior Programmer shall be responsible for providing systems programming support for a variety of task orders.

f. Systems Engineer. The Systems Engineer shall possess at least a Bachelor's degree from an accredited college or university, or equivalent experience, as approved by the Contracting Officer of each order, in a field pertinent to the sphere of responsibility, and have a minimum of seven years of progressive experience. The Systems Engineer shall be responsible for overall system operation, including operation of all hardware, telecommunications and networks.

g. Data Communications/Network Specialist. This specialist shall possess at least a Bachelor's degree from an accredited college or university, or equivalent experience, as approved by the Contracting Officer of each order, in a field pertinent to the sphere of responsibility, and have a minimum of six years of progressive experience. This specialist shall be responsible for outlining problems and providing solutions to data communication projects and problems.

h. Radio Frequency (RF) Technical Specialist. This specialist shall possess at least a Bachelor's degree from an accredited college or university, or equivalent experience, as approved by the Contracting Officer of each order, in a field pertinent to the sphere of responsibility, and have a minimum of seven years of progressive experience, and expert knowledge of RF

hardware and systems. This specialist shall be able to assist the Project Manager and Systems Analyst in requirements analysis, technical problem analysis and resolution, and provide input to the technical staff.

i. Automatic Identification Technical Specialist. This specialist shall possess at least a Bachelor's degree from an accredited college or university, or equivalent experience, as approved by the Contracting Officer of each order, in a field pertinent to the sphere of responsibility, have a minimum of seven years of progressive experience, and possess expert knowledge of various Automatic Identification hardware and systems. This specialist shall be able to assist the Project Manager and Systems Analyst in requirements analysis, technical problem analysis and resolution, and provide input to the technical staff.

j. Technician. The Technician shall have a minimum of four years of progressive experience. The Technician shall be capable of installing all hardware on this contract, as well as all hardware in the Contractor-developed systems. The Technician shall be capable of performing diagnostics on all system hardware.

C.9.5 NOTIFICATION AND RESPONSE. The Contractor shall provide technical engineering services within the time specified in the delivery order for specific technical services required. The on-site locations and objectives of the technical engineering services to be provided shall be stated in the request. Requests for technical engineering services shall originate with the Contracting Officer.

C.9.6 CONTRACTOR'S TRAVEL. All Contractor travel and per diem to perform the on-site technical engineering services shall be in accordance with the Federal JTR.

C.10 TRAINING REQUIREMENTS

C.10.1 DEVELOPMENTAL TRAINING COURSES. The Contractor shall provide both commercially available courses of instruction and developed courses of instruction that meet specified standards and specifications. The following courses of instruction for the tactical AIT configurations shall be designed and developed in accordance with the systems approach to training defined in the Army Training and Doctrine Command (TRADOC) Regulation 350-7:

- a. Instructor and Key Personnel (IKP) Operator Course.
- b. Executive briefing Video.
- c. Manager/Supervisor Training Video.

C.10.2 COMMERCIALLY AVAILABLE TRAINING COURSES. The Contractor shall also provide commercially available courses of instruction to enable Army personnel to develop unique application software programs. Commercially available operator and software courses of instruction shall be provided for the non-tactical AIT components.

C.10.3 INSTRUCTOR AND KEY PERSONNEL (IKP) OPERATOR COURSE. The course shall be introductory in design and purpose and be interactive with the tactical AIT components. A minimum of 75 percent of the

training shall be hands-on. The course shall include, but not be limited to, the following tasks: tactical AIT hardware overview; component power-up and power-down procedures; initial program loading; use of AIT features to include communication features; configuration set-up and tear down; upload and/or download PDCD to Hosts; PDCD to PDCD functions; PDCD to printer functions; and operator PMCS. The course shall teach all tasks selected as a result of task analysis conducted by the Contractor and approved by the Government. Training shall be conducted using Government-furnished AIT equipment with a student to equipment ratio not to exceed 1:1.

- C.10.3.1 Class Size. Not to exceed fifteen students. Instructor to student ratio shall not exceed 1:5.
- C.10.3.2 Course Length. Course length shall not exceed five days, eight work hours a day.
- C.10.3.3 Student Population. Students will generally be instructors, training developers, System Extension Team, software developers, and Software Acceptance Testing personnel, both military and civilian. Students may have limited or no automatic data processing equipment background.
- C.10.3.4 Training Locations. All IKP Operator training shall be conducted at Government facilities designated by the Government. All travel and per diem will be reimbursed to the Contractor in accordance with the Federal JTR.
- C.10.3.5 Course Materials. Task Selection Matrix, Program of Instruction (POI), Lesson Plans (LP), practical exercises, and examinations shall be prepared in accordance with this document.
- C.10.4 TRAINING VIDEOS.
- C.10.4.1 Executive Briefing Video. The Contractor shall develop a script and graphics material for a 10-15 minute videotape that explains AIT and provide it to the COR for review. The videotape shall contain information of a general nature regarding all AIT components (tactical and non-tactical), their interfaces and processes, and the extension of this equipment to the field. The Contractor shall provide the Executive Briefing Video in accordance with CDRL A013.
- C.10.4.2 Manager/Supervisor Training Video. The Contractor shall develop a script and graphics material for a 10 to 15 minute videotape that explains AIT and provide it to the COR for review. The videotape shall contain information of a general nature that describes the tactical AIT automatic data processing resource interfaces, and the process for extending AIT to the field. The Contractor shall provide this training video in accordance with CDRL A014.
- C.10.4.3 Training Video. Instructional Videos. The contractor shall develop a script and graphic materials required for the production of four instructional videos to serve as a fielding aid and provide them to the COR for review. The final master tape shall be delivered within 90 days after script approval. The video tapes shall contain information of a technical nature to instruct equipment users in the field of all aspects involved with the proper usage, installation,

operation, troubleshooting, and maintenance of all equipment associated with CLINs X104AD, X104AE, X104AF, and X104AG, as applicable.

C.10.5 PREPARATION OF TRAINING COURSES.

C.10.5.1 Elimination of Duplication of Effort/Cost. To eliminate any duplication of effort and duplication of cost when preparing the training course, the Contractor shall use, whenever possible:

- a. Data developed under other requirements for this contract, e.g., End User Manuals, etc.
- b. Data developed under past Government contracts.
- c. Data and material (audio visuals, tests, etc.) developed for the other training being procured under this contract.

C.10.5.2 Task Selection Matrix.

a. The Task Selection Matrix shall identify all tasks necessary to operate and maintain tactical AIT equipment. The Contractor shall prepare a list of all tasks necessary to operate and maintain Tactical AIT equipment associated with the matrix.

b. The Task Selection Matrix shall be prepared for the IKP Operator Course in accordance with CDRL A015. The list of tasks is to give an overview of interrelated subjects, showing how many tasks are in a given area and the relationships between them. The most representative of these tasks can then be prepared in accordance with the example shown in Attachment 5.

c. Task Number. Entry in this column should reflect the number assigned to this task. This shall be a 10 digit number in accordance with Army TRADOC Reg 351-11, beginning with "102-020-." The last four digits shall be derived from the contract Master Task List. (Do not use the numbering system shown in Attachment 5.)

d. Task Description. Description of the task to be performed, using appropriate action verb.

C.10.5.2.1 Criteria Key for Task Selection Matrix.

a. Training Aids. A checklist, procedure guides, decision tables, worksheets, manuals, etc; which will be utilized by the soldiers as a training aid in performing their duty position tasks.

Training Aids	Symbols
Help Screens	1
Tutorials	2
Embedded Training	3
Manuals	4
Training Devices	5
Standard Operating Procedures	6
Notes	7

b. Task Difficulties. Determine the difficulties of the tasks in terms of learning and performing utilizing breakouts below.

Very Difficult Symbols

- Ability to perform tasks with practice but still with difficulties. 1
- Task has unique activities.
- Task has numerous concurrent activities.
- Task requires user's concentration.
- Task requires considerable decision making.

Moderate Difficulties Symbols

- Task requires additional assistance or expertise. 2
- Task requires constant practice/performance to maintain proficiency.
- Task requires minimum training to maintain proficiency.

No Difficulties Symbols

- Becomes easier with training. 3
- Requires minimum concentration.
- Task requires minimum decision making.
- Performance simple, no training aids required.

c. Task Importance. Determine the importance of the task to the units mission as listed below.

Very Important Symbols

- High task performance failure. 1
- Task failure leads to mission failure.
- Unacceptable performance will lead to equipment damage, dollars loss, manpower, time, etc.
- Task failure will hamper other unit missions.

Moderate Importance Symbols

- Task failure will hamper unit success in their functions or mission. 2
- Unacceptable performance will cause equipment damage and data loss, but will not hamper unit's mission.

- Other units functions will be affected, but not significantly.

Not Important Symbols

- Other than above (no damage, mission not affected, unit still performs mission, etc.) 3

d. Frequency. Determine how frequent a task is to be performed utilizing the breakout below.

	Frequency	Symbols
- Performed once every two weeks.	Very	1
- Performed once every eight weeks.	Moderate	2
- Performed less than once every eight weeks.	Not	3

e. Trained, Overtrained, No Training. Tasks are categorized into three areas, utilizing the breakout below to determine which tasks to select for training.

To Be Trained Symbols

User must be able to demonstrate proficiency in performing the task at the speed required by the mission. 1

Overtrained Symbols

User must be trained to achieve high standards and retention. Accomplished through reinforced training. 2

No Training Required Symbols

No formal training. Can be accomplished on the job training. 3

Task Difficulties

					Symbol	
V e r y	Important	Yes	Very	Train	1	
		Frequent	Moderate	Overtrain	2	
		No	Infrequent	Overtrain	2	
	Task	Important	Yes	Very	Train	1
			Frequent	Moderate	Overtrain	2
			No	Infrequent	Overtrain	2

Difficulty	Moderate	Important			
			No	Frequent	Very Moderate Infrequent
					No Training No Training Train
					3 3 1
			No	Frequent	Very Moderate Infrequent
					No Training No Training Train
					3 3 1
		Important	No	Frequent	Very Moderate Infrequent
					No Training No Training No Training
					3 3 3

f. Delay Tolerance. Categorize each objective according to its general learning and retention characteristics. Different kind of skills, knowledge, and abilities decay at different rates when not practiced under conditions where feedback is provided. Seven task or objective types have been defined which have somewhat different performance and retention characteristics that impact on their overall level of perishability. Each object can be classified into one of the seven categories. Class codes shall be used to identify objectives.

Task or Objective Type	Description	Class Code
Integrated Cognitive and Behavioral Skills Performance	Coordinated task performance requiring multiple complex cognitive and/or behavioral skills whose use is governed by rules in dynamic situations, or rapid integration and synthesis of sensory information. Highly perishable.	6
Variable or Contingency Cognitive or Behavioral Skills Performance	Performance of procedures or application of cognitive skills requiring flexible response to a wide variety of contingencies or variations in conditions or data; normally associated with a single task or skill area. Moderately to highly perishable.	5
Rule or Concept Utilization	Simple or complex classification or decision tasks or skills based on applying concepts or rules to available information in given situations. Moderately perishable.	4
Invariant Procedures	Specific procedures directed toward completing one major task or activity seldom with contingencies. Performance is essentially linear regardless of	3

	length of procedures. Low to moderate perishability.	
Basic Cognitive or Behavioral Skill	Basic skills which are concerned with aspects of equipment operation or performance of cognitive tasks; typically prerequisites or components of higher-level skills. Low perishability.	2
Knowledge	Facts of any type concerning equipment structure, characteristics and operation, specific aspects of mission performance, or general (as opposed to situation-specific) data. Low perishability.	1
Basic Level Behaviors	Psychomotor or cognitive task components at a lower level than sub-tasks or procedures (not knowledge) which would not be evaluated independent from the sub-tasks or procedures of which they are components. NOTE: Basic Level Behaviors are included here to discriminate them from tasks, sub-tasks, procedures and objectives.	0

g. Sustainment Training Requirements. Based on delay tolerance/task objective perishability sustainment training requirements are identified by how much time is allowed between training and accomplishment of the task or frequency for task sustainment training. To maximize personnel readiness to perform their missions, critical and perishable skills must be maintained at high levels by sustainment training. If the criticality classification code is that the task is critical or if the perishability classification code is high or moderate, the objective should be identified with "YES" (Y) as requiring sustainment training and followed by the time element in days. An example is Y 30. This indicates that the task is perishable and is not successfully accomplished in the past 30 days the task is a candidate for immediate sustainment training. If the analysis is that sustainment training use code is (N) for "NO", this will indicate that sustainment training is not required.

h. Critical Combat Tasks. The key issue is will the soldier be required to accomplish the task under combat conditions. First, the configuration must be identified as a peacetime configuration or a go-to-war configuration. Secondly, if it is a go-to-war configuration, will the soldiers be required to accomplish the task or is it a peacetime task on the configuration that will be discarded in wartime. If the task is combat critical use code (Y) for "YES". If the task is not combat critical use code (N) for "NO".

i. Dependency to Other Tasks. Applies to tasks performed in sequence. If a task is preliminary to another task then use code (Y) for "YES". If a task is included in another task, (for example, diagnostic task is part of a troubleshooting task), use code (Y) for "YES". If a task is performed independently of other tasks, use code (N) for "NO".

j. Similar to Other Tasks. If the task is similar to one or more other tasks use code (Y) for "YES". If its unique, use code (N) for "NO".

k. Personal Injury Likely. Tasks which, even when performed carefully, present a danger to the repairer or operator would use code (Y) for "YES".

l. Equipment Damage Likely. Tasks which, even when performed carefully, can result in damage to the equipment should use code (Y) for "YES". If no damage likely use code (N) for "NO".

m. Coordination Required. If more than one person is required to do this task use code (Y) for "YES". Weight, size, and locations are to be considered. If a person will normally accomplish this task alone use code (N) for "NO".

n. Selected/Rejected. Tasks selected for training are marked (S). Tasks rejected are marked (R). The reasons for selection or rejection are coded below:

(1) Reasons for Selection

Codes	Description
1	Percent of personnel performing task.
2	Percent of time spent performing task.
3	Consequence of inadequate performance.
4	Task delay tolerance.
5	Frequency of performance.
6	Task learning difficulty.
7	Probability of deficient performance.
8	Skill decay.

(2) Reasons for Rejections

Codes	Description
a	Easy to learn.
b	Not critical.
c	Very seldom performed.
d	Duplicated another task in this job.
e	Duplicated another task which is a prerequisite of the target population.

C.10.5.2.2 Task Adequacy Check.

The Contractor shall conduct, and the Government may witness, the task adequacy check at the second and third training conferences. The task adequacy check is to be a step-by-step performance of the

tasks, as described, to familiarize the trainers with their complexity, and will enable the trainers to more intelligently review the rationale used by the Contractor in the selection of tasks requiring training. The task adequacy check shall be performed using the task selection matrix.

C.10.5.3 Course Design.

a. Program of Instruction (POI). The Contractor shall convert each task selected for training into a learning objective which shall become the objective for each training appendix of the POI. Format for the POI shall be in accordance with CDRL A016.

b. Lesson Plans (LP). The Contractor shall prepare LP in the format illustrated in Attachment 7. The learning objective is a three-part objective which describes the behavioral task desired, the performance condition, and the attainment standard expected of the student upon completion of the lesson. The objective is to be performance oriented and task-driven. The LP shall be provided in accordance with CDRL A017.

c. The task is the performance that the student must do to demonstrate satisfactory achievement of a given objective. The task must be OBSERVABLE and MEASURABLE. When writing the task statement, the writer should choose action verbs that specify what the student must do as an observable and measurable activity.

d. The condition statement specifies the limits within which the student is expected to perform. The work environment must be described. This includes a description of tools, equipment, and special job aids or manuals that will be provided, and environmental conditions which affect the tasks to be performed. If the student must perform without reference or from memory, then without reference is a condition.

e. The standard describes the minimum level of performance that will be accepted as evidence that the student has achieved the objective. The standard provides a criterion for judging the effectiveness of the student's performance. If possible, the standard should be consistent with what the student encounters on the job.

C.10.5.4 Media of Instruction. The Contractor shall select a media based on a step-by-step analysis of the learning objectives. Some of the media that shall be considered are:

- a. Slides.
- b. Video and audio recordings.
- c. Charts.
- d. Transparencies.
- e. End User Manuals.

C.10.5.5 Methods of Instruction. After selecting the media, the Contractor shall develop the instructional material to teach the specified

learning objectives. Some of the methods of instruction that shall be considered are:

- a. Instructor/Conference.
- b. Instructor-led Practical Exercises.
- c. Practical Exercises performed by students without instructor assistance. All courses shall use practical exercise materials. No less than 75 percent of the IKP Operator Course shall be devoted to hands-on practical experience.

C.10.5.6 Testing of Students. Testing shall be conducted throughout the course by means of progress and end-of-course tests graded on a Go/No-Go (Pass/Fail) basis. Successful completion of 70 percent of all tasks constitutes satisfactory completion of the test. Alternate progress tests shall be developed for use when students fail to perform satisfactorily.

C.10.5.7 Course Materials. The Contractor shall use commercial literature as the basic classroom reference texts until the End User Manuals are available under this contract. At the beginning of each class, one copy of the basic classroom reference text, one copy of the POI, LP, and a hard copy of all transparencies shall be supplied in a binder to each student for retention. Upon graduation, the examination shall be supplied to and retained by each student.

C.10.5.8 Training Materials. The Contractor shall provide the following training materials:

- a. Task Selection Matrix shall be prepared and delivered in accordance with CDRL A015.
- b. POI shall be prepared and delivered in accordance with CDRL A016.
- c. LP shall be prepared and delivered in accordance with CDRL A017.
- d. Progress and end-of-course tests shall be prepared and delivered in accordance with CDRL A018.
- e. Audio/visual aids shall be prepared and delivered in accordance with CDRL A019.

C.10.5.9 Training Location, Facilities, Equipment, and Support. The training facilities, equipment, and support shall be as described below. The actual sites to be used will be determined by the Government.

- a. Government Site. The Government will provide classrooms and required PCs. The Contractor shall provide all general and special supplies, tools, and equipment. Tactical AIT equipment used for training at Government sites shall be part of the quantity scheduled for delivery at that site.
- b. Instructor Qualifications. The Contractor's instructors shall possess and be able to demonstrate their ability to operate tactical AIT equipment as required in the practical work experience

portion of the training course. In addition, the instructors shall have experience as a training instructor which includes one of the following:

1. Technical Training. College, Vocational School (beyond high school), or Armed Services training.

2. Professional Training. College or Armed Services training in: Course design using performance objectives, classroom presentation techniques, and criterion testing.

3. Teaching Experience. One year instructing in a formal classroom atmosphere or as part of a System Extension/New Equipment Training Team.

c. Approval and Acceptance of Contractor Services and Material. The determination that the training services, instructors, and materials provided by the Contractor are satisfactory will be made by the COR.

d. Student Training Course Evaluation Forms. The following Government furnished forms shall be completed and delivered in accordance with this document and appropriate CDRLs. The forms are illustrated in Attachment 8.

1. Student Registration Form.

2. Installation Training, Attendance and Rating Record, Department of the Army (DA) Form 86.

3. Training Course Data Form.

4. Student Evaluation of Training.

5. Certificate of Training, DA Form 87.

e. The Contractor shall complete a DA Form 86 for each class. The Contractor shall have each student complete a Registration Form at the beginning of each class and a Student Evaluation of Training at the end of each class, and submit these completed forms with the completed DA Form 86 to the Government no later than 10 working days after class completion. The Contractor shall complete a DA Form 87 and provide it to each student successfully completing a course of instruction. (CDRL A020)

C.10.6 SOFTWARE DEVELOPER (SD) TRAINING COURSE.

C.10.6.1 General. SD training shall be conducted using AIT equipment, commercial software products provided under this contract, personal computers (PCs), and shall use commercially available training materials and Computer Assisted Instruction (CAI). The student to Contractor-Furnished AIT equipment ratio shall not exceed 1:1. All course objectives shall include interactive instruction and operation of all AIT equipment ordered under this contract. The course objectives shall include, but not limited to, the following:

a. Using the label/form generation software, application generation software, and compiler languages software. Each of these

software courses shall be available individually in that the user may order one or more of the courses provided.

b. Provide students with an overview of all tactical and non-tactical AIT configurations and capabilities (i.e., set-up and tear-down, operations, check-out, fault isolation, and operations of communications).

c. Provide initial program loading of AIT equipment.

d. Provide training on the AIT operating systems; how to code, compile, and execute programs; install and maintain AIT host computer applications programs; install and/or maintain PDCD operating systems, communications, protocols.

e. Provide instruction on the data entry functions.

f. Provide students with an overview of the AIT compiler capabilities and limitations as pertains to applications programs that will be executed.

g. Provide instruction in all software, and communications protocols. Provide an overview of the programming language.

h. Provide instruction in uploading and downloading data.

i. Provide instruction on interfaces.

j. Provide instruction on Contractor supplied software development/support tools.

k. Provide instructions in procedures for performing user administration functions (i.e., log-on, password change, adding/deleting users, controlling file/directory access, canceling tasks).

l. Provide instruction in procedures for performing management functions.

C.10.6.2 Training Location, Facilities, Equipment and Support. Training shall be conducted at Government software development facilities located at Fort Lee, VA; Fort Sam Houston, TX; and Military District of Washington for the tactical AIT components. Training for non-tactical AIT components may be conducted at the Government's sites stated above or at Contractor's facility. All travel and per diem will be reimbursed to the Contractor in accordance with the Federal JTR.

a. Class Size. Not to exceed 15 students.

b. Course Length. The SD training course shall not exceed 10 days, eight work hours per day.

c. Student Population. Students will be programmers and/or system analysts who have experience with compiler languages.

d. Equipment. The Government will be responsible for furnishing PC equipment when at the Government's facility. The

Contractor shall provide the PC equipment at the Contractor's facility.

e. Course Materials. Commercial training materials shall be used for the conduct of the SD course.

C.10.7 AIT OPERATOR/MAINTENANCE TRAINING FOR NON-TACTICAL AIT EQUIPMENT.

C.10.7.1 General. The Contractor shall provide training courses/modules, using commercial materials and standards, to train Government personnel in the operation and maintenance of all non-tactical AIT equipment. The Contractor shall include a schedule of costs so that users may order any or all courses/modules in order to meet their unique requirements. All instruction shall be based on commercial training materials and shall reflect that instruction normally provided to commercial users of the following equipment.

a. PDCD, including the Hand-held, Non-contact Bar Code Scanner; Digital Wand Scanner; Bar Code Printer; and Portable Bar Code Analyzer and Analyzer Printer.

b. Fixed Bar Code Reader.

c. Page Printers.

d. RF Data Communications System, including RF Modem.

e. Connectivity Devices.

f. Portable Voice Data Collection Device.

C.10.7.2 Training Location, Facilities, Equipment and Support.

a. Training Site. The Contractor shall provide all classrooms, laboratory facilities, and equipment for training. Equipment identified for training purposes shall be dedicated to training during scheduled class hours. Equipment used for training at a Contractor's facility may be subsequently delivered to the Government under this contract, provided the equipment is refurbished and passes delivery acceptance criteria. Inoperative training equipment shall be returned to operational condition or replaced no later than one hour after failure. The Contractor shall provide a minimum of 36 square feet of classroom floor space and a minimum of 75 square feet of practical application/laboratory floor space per student, exclusive of instruction and storage requirements.

b. All non-tactical AIT operator courses shall be conducted at the Contractor's site, using Contractor-supplied equipment and training materials.

C.10.8 TRAINING CONFERENCE.

a. Training conferences shall be held at Government designated facilities to review the development of training materials, and the delivery of training, as per the following schedule. The Contractor shall provide the Government with the conference agenda and minutes in accordance with CDRL A004 and CDRL

A005. A minimum of five training conferences are required, but more may be scheduled as the Government deems necessary.

1. Training Conference No. 1. Training Conference No. 1 to be held no later than 14 days after issuance of delivery order for the Government review of:

- (a) The outline IKP Operator Course POI for format and content.
- (b) One outline LP based on the draft POI.
- (c) Outline Task Selection Matrix.

2. Training Conference No. 2. Training Conference No. 2 shall be held no later than 35 days after issuance of delivery order for:

- (a) The Government to receive a draft POI, Visual Aids, Test and LP Objectives for the IKP Operator Course.
- (b) Performance of the IKP Operator task adequacy checks.

3. Training Conference No. 3. Training Conference No. 3 to be held no later than 70 days after issuance of delivery order for:

- (a) Presentation of Government comments on the revised draft POI, Audio Visual Aids, tests, and LPs.
- (b) Government to receive scripts for Executive Briefing Video and Manager/Supervisor Video Training.
- (c) Complete IKP Operator task adequacy checks.
- (d) Government to review SD training material.

4. Training Conference No. 4. Training Conference No. 4 to be held no later than 98 days after issuance of the delivery order for:

- (a) Government approval of IKP Operator training.
- (b) Government approval of scripts for video training.
- (c) Contractor to validate IKP Operator course using two military personnel as students. The Government will witness the validation.

5. Training Conference No. 5. Training Conference No. 5 to be held 182 days after issuance of the delivery order for final Government review and approval of IKP Operator Course training materials.

b. Validation and Verification of the IKP Operator Course. The Contractor shall validate the IKP Operator Course during

Training Conference No. 4. The Government will provide two military personnel that are representative of the target audience for this validation. Verification of the IKP Operator Course will be conducted by the Government during the first class. The 15 students in this class will be the target audience and any revisions required as a result of this verification will be reviewed and approved at Training Conference No. 5.

C.11 DOCUMENTATION REQUIREMENTS

C.11.1 GOVERNMENT RIGHTS. The Government shall have full and unrestricted rights to use and reproduce, for its own use, all documentation provided under this contract.

C.11.2 BASELINE DOCUMENTATION. The Contractor shall provide a complete set of baseline equipment and software documentation, in the Contractor's commercial format, to include: Equipment Functional Descriptions; User's or Operator's Manuals; and, Maintenance Manuals. The Contractor shall provide a user and maintenance documentation package, as defined above, with each AIT equipment item. Where special software documentation is required, the Contractor shall provide documentation defining its interface and relationship to existing software and operation. All documentation shall be at a level of detail sufficient to fully define the operator interface and application operations.

C.11.3 COMMERCIAL MANUALS. Commercial manuals shall be provided with each piece of hardware and software in accordance with CDRL A021.

C.11.4 ORDERING GUIDE. The Ordering Guide will be a comprehensive tool that enables prospective users to order hardware, software, cables, training, technical engineering services and maintenance without difficulty. The Government will be responsible for reproduction and distribution of the Ordering Guide. The guide shall be provided in seven sections for ease of use. The sections shall provide the user with a complete guide to configure an AIT system (hardware, software, and cables), train personnel, and maintain the system. The Ordering Guide shall be bound in a three-ring binder to facilitate updates and changes, as required. The Ordering Guide sections shall be organized as follows:

- a. Section 1: Ordering Procedures
- b. Section 2: Hardware (divided into major types of equipment, i.e., PDCDs, printers, scanners, etc.)
- c. Section 3: Recommended system configurations
- d. Section 4: Software (both operating and applications)
- e. Section 5: Cables
- f. Section 6: Technical Engineering Services
- g. Section 7: Training
- h. Section 8: Maintenance Support

C.11.4.1 Sections. Each section shall be technically accurate and complete with descriptions of the hardware, software, or services (as applicable) and the price for each. The following paragraphs identify the minimum requirements for each section of the guide.

a. Section 1 - Ordering Procedures. Section 1 shall contain procedures that provide the user with all the necessary information required to order and account for receipt of AIT equipment. Ordering procedures shall be tailored for the individual Uniformed Services and Government agencies that use this contract. Service/agency points-of-contact, telephone numbers, and addresses shall be included. Necessary documents and forms required to order and receipt for AIT equipment shall be clearly indicated. A diagram or flow-chart shall be included that graphically depicts entire procurement process, including the flow of documents, from selection of AIT equipment to receipt of the equipment.

b. Section 2 - Hardware. Section 2 shall be organized into sub-sections based upon the major types of equipment, i.e., terminals, printers, modems, etc. It shall contain a description of the salient features of each piece of equipment, including physical dimensions, power requirements, heat generated by equipment, and site preparation requirements. Precautions, such as the minimum distance between various devices, shall be listed. All cable requirements for hardware installation shall be described in Section 5 of the Guide. Section 2 shall clearly indicate cables/interfaces appropriate for the various AIT devices and provide a reference to the applicable parts of Section 5. Users must specify equipment destination to ensure AIT equipment is compatible with the commercial power supply and adapter plugs for the geographical area in which it will be operated.

c. Section 3 - Recommended Equipment Configurations. Section 3 shall address the Contractor's recommended equipment configurations to meet various user's AIT requirements. The recommended configurations shall represent the most economical hardware, software, and service items that meets the user's requirements. The configurations shall include the appropriate CLIN numbers.

d. Section 4 - Software. Section 4 shall provide a description of all software packages available that includes a discussion of primary function, minimum RAM requirements, program capabilities, and major features and benefits. It shall explain, in non-technical terms, the recommended software packages for specific applications.

e. Section 5 - Cables. Section 5 shall list all provided cables and equipment cable requirements in a chart format that will allow the user to identify the correct cables for connecting AIT devices.

f. Section 6 - Technical Engineering Services. Section 6 shall contain procedures that provide the user with all necessary information required to order technical engineering services. All technical engineering services identified in C.9 shall be addressed in this section.

g. Section 7 - Training. Section 7 shall provide a course description, length, prerequisites, course objectives, recommended audiences, locations of the Contractor's training facilities, course schedules, and prices for each course. It shall also include a complete curriculum outline which details the day-to-day presentations, topics covered, and the proficiency level required for successful completion of the course. All training requirements identified in paragraph C.10 shall be addressed in this section.

h. Section 8 - Maintenance Support. Section 8 shall specify the various maintenance options available to the user worldwide. It shall include instructions for ordering maintenance support and the price for each option as specified in paragraph C.8. The section shall be divided into three sub-sections: CONUS, OCONUS (Europe), and OCONUS (Asia).

C.11.4.2 Updates. The Contractor shall provide the COR with the Ordering Guide in accordance with CDRL A022. The Contractor shall provide periodic updates that provide worldwide Government customers with instructions and guidance on ordering AIT equipment and services from this contract.

C.11.5 REPORT. The Contractor shall submit a Technical Engineering Services Summary Report (TESSR) to the COR within five working days after the completion of each trip made for technical engineering services. (CDRL A023)

C.12 MANPOWER AND PERSONNEL INTEGRATION (MANPRINT) PROGRAM

The Contractor shall establish and maintain a MANPRINT program for all AIT **tactical** components in accordance with Army Regulation (AR) 602-2. The purpose is to field configurations that are safe and efficient. Further, the configuration must be maintained and operated within the existing manpower structure; personnel skills; and for the tactical portion, the Government approved training program. The Contractor shall integrate all MANPRINT elements, Integrated Logistics Support (ILS), and the configuration design. The following areas shall be emphasized:

a. Manpower and Personnel - No increase above current levels and minimize the need for additional skill/specialty.

b. Human Factors - User interface.

c. Safety - Operator and configuration safety.

d. Health Hazards - Elimination of conditions that may cause injury, illness, disability, or death.

e. Training - Ease of Operator Training.

C.12.1 PLANNING AND EXECUTION.

C.12.1.1 General. A tailored MANPRINT effort shall be an integral part of the integration of hardware/software, analysis, and any testing required. The MANPRINT program shall be planned and executed to meet the objective, characteristics, and constraints set forth below. The program shall effectively integrate the MANPRINT domains

with one another, with the ILS and Quality Assurance Programs, and with the AIT integration process.

- C.12.1.2 MANPRINT Program Plan. The Contractor shall comply with the MANPRINT Program Plan as approved at time of award.
- C.12.2 OBJECTIVE. The objective of the MANPRINT effort shall be to integrate all elements of AIT involving personnel performance and safety and, based thereon, to influence integration to optimize total effectiveness.
- C.12.3 SCOPE. MANPRINT Program elements shall include training programs, Human Factors Engineering (HFE), safety considerations, and biomedical and health hazards. The emphasis of MANPRINT shall be on:
  - a. Early recognition and resolution of personnel operational/maintenance, and software support issues.
  - b. Performance (effectiveness and availability) to include personnel performance.
  - c. Fielding of a configuration that meets the total operational and support requirements.
- C.12.4 MANPRINT PROGRAM EMPHASIS AREAS. Within the context of the above considerations, the MANPRINT program shall include and emphasize the HFE, and Safety domains.
  - C.12.4.1 Human Factors Engineering (HFE). A HFE effort shall be provided to achieve the required effectiveness of personnel performance during operations, and support and to make economical demands upon manpower resources, skills, training, and costs. While a detailed human factor engineering plan and formal program are not required, HFE shall be a specific component of analysis, design activities, and operating and maintenance procedures throughout the life of the contract. HFE shall be undertaken in accordance with paragraphs of MIL-H-46855B.
  - C.12.4.2 Safety. The Contractor shall develop and implement a Safety Program Plan complying with Task 100 and Section 4, MIL-STD-882B to ensure that safety activities are executed throughout the AIT Program. (CDRL A024)
    - a. Hazard Risk Assessment. A hazard risk assessment code shall be assigned to each identified hazard of this program using the matrix given below.

HAZARD RISK ASSESSMENT MATRIX

FREQUENCY OF OCCURRENCE	HAZARD SEVERITY			
	I CATASTROPHIC	II CRITICAL	III MARGINAL	IV NEGLIGIBLE
(A) FREQUENT	1A	2A	3A	4A

(B) PROBABLE	1B	2B	3B	4B
(C) OCCASIONAL	1C	2C	3C	4C
(D) REMOTE	1D	2D	3D	4D
(E) IMPROBABLE	1E	2E	3E	4E

Hazard Risk Assessment Code	Risk Level
1A, 1B, 1C, 1D, 2A, 2B, 2C, 3A	High
1E, 2D, 3B, 3C, 4A	Medium
2E, 3D, 3E, 4B, 4C, 4D, 4E	Low

All identified hazards shall be reviewed for acceptability in accordance with above criteria. Those found to be a high or medium risk level shall be reduced to a low risk level by means consistent with paragraph 4.4, System Safety Precedence, in MIL-STD-882B.

b. Safety Assessment.

1. Safety Assessment Report (SAR). The Contractor shall prepare and submit a SAR in accordance with CDRL A025. The SAR shall evaluate the safety risk being assumed prior to test or operation of the configuration; shall provide specific controls or precautions to be followed in the use of the configuration; and shall provide verification of compliance to standards and codes used to ensure the safe design of the configuration. Specifically, verification of the safety design standards and/or requirements listed below shall be furnished in a tabular format listing "Safety Criteria" in another column. The analysis shall show compliance/non-compliance of the listed safety criteria and provide justification for any non compliance.

- (a) MIL-STD-454M, Requirement 1, Paragraphs 4 and 5.
- (b) MIL-STD-1472D, paragraph 5.9.11.3 and 5.13.
- (c) MIL-STD-1857(EL), Paragraph 3.2.8.
- (d) MIL-T-28800D, Paragraph 3.9.1.2a.

2. Health Hazard Assessment. If the equipment produces non-ionizing radiation (RF, microwave, infrared, X-rays, laser, etc.), provide hazard range information in the SAR.

c. Safety Inspection/Verification. The Contractor shall schedule sufficient time in the program schedule to permit a safety inspection of the configuration, prior to testing of the configuration. This inspection will be used to verify the information contained in the SAR. The Contractor must allow sufficient time to correct any unresolved high or medium risk hazards prior to testing or fielding of the configuration.

C.12.4.3 Health Hazards. The Contractor shall record and maintain a list of all biomedical and health hazards present during the operation and

support of AIT hardware, including natural and induced hazardous environments, and provide results at the Safety Working Group meetings.

a. Radioactive Materials. The Contractor shall record and maintain a list of all radioactive material contained in AIT components. The list shall include the chemical composition and description, physical form, and activity of the finished item(s) in the use, maintenance, transportation and storage of the AIT components. If no radioactive materials are utilized in the AIT components, this shall be so stated in the SAR and a fully supportive explanation shall be provided. Specifically describe the control measures taken to ensure that the equipment hardware is free of any radioactive materials.

1. Radioactive Materials. If radioactive materials must be utilized, the following analysis must be performed as part of a request for Government approval:

(a) Establish these materials so the only means of meeting military operational requirements.

(b) Provide sufficient data to permit the government to secure a license for the radioactive material.

(c) Assure minimum hazard to personnel during manufacture, use, transportation, and disposal.

(d) Prepare a Material Safety Data Sheet, DD Form 1813.

2. Non-Exempt Electron Tubes. If the material is not an exempt electron tube (less than 1 microcurie per tube for all isotopes except Radium-226, which must be less than 0.01 microcurie) then the following information and procedural controls shall be specified:

(a) Marking of item(s) and area(s).

(b) Ultimate disposal.

(c) NSN and part nomenclature of each radioactive item.

(d) NSN of all end articles containing the radioactive item.

(e) Total number of radioactive items per end article.

(f) Total number of radioactive items to be procured, including spares.

C.13 END USER MANUAL

The Contractor shall provide a tactical End User Manual (EUM) that identifies tasks and processes for the entry of data, specification of outputs, and operation of information system equipment. The EUM

shall be oriented to presenting step-by-step procedures, and be written in accordance with CDRL A026.

C.13.1 APPLICABLE SPECIFICATIONS.

- a. DOD-STD-7935A, DOD Automated Information Systems (AIS) Documentation Standards
- b. MIL-M-38784C, Manuals, Technical: General Style and Format Requirements
- c. MIL-M-63036D, Manuals, Technical, Operators Preparation
- d. MIL-M-85337, Manuals, Technical: Quality Assurance Program, Requirements for
- e. AR 25-30, The Army Integrated Publishing and Printing Program
- f. MIL-STD-1379D, Military Training Program

C.13.2 REQUIREMENTS.

C.13.2.1 General. The Contractor shall develop the EUM for the functional end user, in accordance with CDRL A026 and supplemented by applicable specifications identified in Section C.13.1. In the event of a conflict between the Applicable Specifications in C.13.1 and the specifications of the contract, the specifications of the contract shall govern. Manuals shall be delivered to the Government on loose leaf, three hole punched, 8 1/2 by 11 inch bond paper and shrink wrapped.

a. Maintenance Allocation Chart (MAC). The Contractor shall include the MAC prepared in accordance with Sections C.8.4.1 of this document, as an appendix to the EUM. This appendix shall be referred to throughout the EUM text, as appropriate.

b. Components of End Item (COEI), Expendable and Durable Items, and Preventive Maintenance Checks and Services (PMCS). The Contractor shall prepare COEI in accordance with paragraph 3.2.8.2, and the Expendable and Durable Items List in accordance with paragraph 3.2.8.4 of MIL-M-63036D. These shall be included as appendices to the EUM. The PMCS table shall be prepared in accordance with paragraph 3.2.3.5, MIL-M-63036D and also included as an appendix.

c. Government-Furnished Data. Data on Government-furnished or Army standard (part of end item or auxiliary) items will be furnished by the Government. The Contractor shall integrate the operational and functional relationship of those items to, and their use with, Contractor-furnished software and equipment into the End User Manual.

d. Source Data. The Contractor shall make maximum use of the following source data:

- 1. All information and illustrations previously obtained in development and production of similar equipment and

software.

2. Data developed in accordance with this contract or provided by the Government, such as: the MAC, RPSTL, engineering drawings, etc.

3. Existing commercial literature.

e. Copyright Release. The Contractor shall arrange to have a release for use of copyright or proprietary data furnished directly to the Government from the holder of the data rights. No advertising other than copyright/data credit line shall appear in the publications. Credit line, if required by the copyright/data holder, shall appear at the top of the title page.

C.13.2.2 Technical Manual Plan (TMP). The Contractor shall prepare a TMP and present it to the Government for approval. The TMP shall be developed in accordance with CDRL A027. As part of the TMP, the Contractor shall provide, for Government approval, samples of chapter headings, section headings, and text showing type fonts and sizes to be used in new publications and any supplemental material. The Contractor shall submit examples of tables, procedures, and illustrations for Government approval to demonstrate narrative manual requirements are being correctly interpreted.

C.13.2.3 Validation Plan. The Contractor shall prepare a Validation Plan in accordance with CDRL A028. As part of the Validation Plan, the Contractor shall provide a list of Contractor-furnished test equipment to be made available for use during Contractor validation and Government verification of the End User Manual. Unless the Government approves equivalent equipment, all test equipment shall be that used for operation in the field. The Contractor shall identify as part of the Validation Plan any equipment that must be Government-furnished.

a. Validation. Validation shall be performed by the Contractor at the Contractor's facilities, in accordance with MIL-M-63036D. The Contractor shall notify the Government 45 days prior to actual validation. Validation shall include checks of the End User Manual against engineering drawings and equipment specifications, and the performance of operator and operator maintenance procedures by Contractor personnel. The Government may witness the validation. The Contractor shall maintain records of all validations for Government inspection, and provide a Technical Manual Validation Certificate in accordance with CDRL A029.

b. Verification. Verification will be performed by the Government, in accordance with MIL-M-63036D, at the Contractor's facilities, using military personnel. The Contractor shall provide appropriate engineering and technical personnel. The Contractor shall provide the AIT equipment identified in the Government Verification Plan. The Government will provide standard Army items identified in the plan as Government-furnished equipment.

C.13.3 ORIENTATION, REVIEW AND ACCEPTANCE.

C.13.3.1 Publication Guidance Conference. The Contractor shall request a Publication Guidance Conference to be held within 30 days after a

delivery order is issued, to obtain specific guidance in the preparation of the required publications. The Publication Guidance Conference may be held concurrently with the Training Guidance Conference.

- C.13.3.2 Government In-Process Reviews (IPRs). Government IPRs for the EUM shall be held concurrently with the Training Conferences No. 3, 4, and 5. When not indicated on a formal schedule, IPRs, validations, verification, and other meetings requiring attendance of Government personnel shall be arranged with the COR at least 30 days in advance.
- C.13.3.3 Acceptance. The Government will make a complete and detailed review of the submissions to determine their completeness, accuracy, and conformance of the cited specifications. The COR will advise the Contractor of the final acceptance or rejection.
- C.13.3.4 Rejection. If the material reviewed in accordance with Section C.13.3.3 is found unacceptable because of failure to meet the contract requirements, the rejected text and illustrations will be returned for correction and resubmission. The Government will have the right to use portions of the rejected material to print technical publications or parts thereof. Printing by the Government does not constitute acceptance of the rejected material.
- C.13.4 SCHEDULE SUMMARY. Key events are the scheduled IPRs noted in Section C.13.3.2, and the validation, verification, and delivery dates noted below. The Contractor shall notify the Contracting Officer immediately if cited dates in approved schedules and documents cannot be met.

Event	After Delivery Order is Issued
EUM Validation	105 days
EUM Verification	126 days
EUM Final Delivery	154 days

- C.13.5 SPECIAL INSTRUCTIONS.
  - C.13.5.1 Residual Materials. Residual materials (original art work, oversize reproductions, negatives, etc.) for all new publications and supplements shall be the property of the Government.
  - C.13.5.2 Document Tailoring. Applicable documents and specifications are tailored as follows. These documents apply in their entirety; where options exist the below listed options and exceptions shall be followed.
    - a. MIL-M-38784C; Manuals, Technical: General Style and Format Requirements, 16 April 1983.
      - 1. Manuals shall be prepared single column.
      - 2. Warning pages shall be numbered as pages a, b, c, etc.

3.2.1 3. A draft shall be provided in accordance with para

4. Text size shall be 10 point.

5. Page size shall be 8 1/2 x 11.

b. MIL-M-63036D; Manuals, Technical: Operator's, Preparation of, 3 June 1988. Validation and verification methods shall include:

1. 100 percent verification by Target Audience personnel.

2. Government participation in validation.

3. Performance of procedures on equipment by Government personnel.

4. Government witness of validation.

C.13.5.3 Use of Engineering Drawings. The following clarification of paragraph 3.6.6, MIL-M-38784C, concerning the use of engineering drawings as illustrations to appear in technical publications, shall be used as guidance in the determination of requirements for reproducibility, legibility, and readability. It is incumbent upon the Contractor to provide firm requirements to engineering drawing personnel sufficiently in advance that engineering/manufacturing drawings can be used with slight modification for technical publications illustrations. Engineering drawings shall be subject to approval by the COR on a case-by-case basis. Parameters for determination of reproducibility, legibility and readability requirements as specified in MIL-M-38784C:

a. Symbology - Shall be in accordance with the applicable MIL-STD/ANSI standards as described in paragraph 3.6.26.2, MIL-M-38784C.

b. Lines - All lines when reduced to final publication size shall be consistent in weight, without breaks, and have no skips or fading. Line weight consistency includes symbols, leader lines, and other line work making up illustrations. All line work shall comply with requirements of paragraph 3.6.4 and 3.6.26.1 of MIL-M-38784C.

c. Lettering - All lettering shall be typeset or mechanical and shall be sans-serif gothic, upper case. See paragraph 3.6.16, MIL-M-38784C. Lower case lettering is unacceptable. Lettering shall be consistent in line weight without "filling in" and have ample spacing between letters and words to preclude leaching of character-to-character, or word-to-word, which destroys legibility. Lettering when reduced to final size should not be less than .080. Freehand lettering, if used, shall be sans-serif gothic lettering, and shall not be stylized.

C.13.5.4 Reading Grade Level. Reading grade level for any sample of the EUM shall not exceed the 9th grade using the Flesch-Kincaid method defined in AR 25-30. Overall reading grade level for all samples shall not exceed the 9th grade. An automated reading grade level system may be used to meet this requirement.

C.14 TECHNICAL DOCUMENTATION

C.14.1 SUPPLEMENTARY PROVISIONING TECHNICAL DOCUMENTATION (SPTD). As directed by the Government, the Contractor shall submit SPTD for AIT components that have no NSN. Submissions shall be drawings or other descriptive data in accordance with CDRL A030.

C.14.2 REQUEST FOR NOMENCLATURE. Nomenclature data shall be prepared and updated as required in accordance with CDRL A031, for the tactical configurations and all AIT components that have no NSN assigned.

C.14.3 AGENDA AND MINUTES. The Contractor shall prepare a conference agenda in accordance with CDRL A004 and publish the minutes of all training and publications conferences and IPRs in accordance with CDRL A005.

C.14.4 TECHNICAL SERVICES REPORT. The contractor shall provide a monthly Technical Service report in accordance with DI-E-5038A and CDRL A032

C.15 QUALITY ASSURANCE

The Contractor shall provide Quality Assurance to ensure that the requirements of this contract are met, from initial acceptance of equipment by the Government throughout the life of the contract.