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MAINTENANCE DATA TERMINAL

SECOND INVITATION FOR BID

EVALUATION TEST

LETTER OF FINDINGS

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April 1990

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1. INTRODUCTION.

This Letter of Findings details the results of the Maintenance Data Terminal (MDT) evaluation testing that was performed at the Federal Aviation Administration (FAA) Technical Center, Atlantic City International Airport, N.J. The testing was conducted to verify that engineering changes made to the Everex AGI 1800 Fixed Maintenance Data Terminal (FMDT) units evaluated in July of 1989 will not affect field deployment of the units. ACN-230 conducted the evaluation testing in two sessions: an initial session for printer evaluation from February 26, 1990 through February 28, 1990; and a second session for FMDT and printer evaluation from March 8, 1990 through March 22, 1990.

The equipment tested was from International Data Products (IDP) Corporation in response to Invitation for Bid (IFB) Solicitation No. DTFA01-89-B-06588. ACN-230 performed evaluation testing according to the Maintenance Data Terminal (Second IFB) Evaluation Test Plan document, dated May 24, 1989, and the Test Procedures for the Maintenance Data Terminals and Peripherals documents, dated June 9, 1989. The printer equipment was initially set up by ACN-230 in the MDT Test Bed Laboratory at the FAA Technical Center on February 26, 1990, removed on March 8, 1990, and replaced on March 19,1990. The FMDT units were set up by IDP personnel on March 8, 1990. The equipment consisted of the following:

a. FMDT - two each: Everex AGI 1800A System Unit, PB1422EG Monitor, AGI 101 Keyboard, and Power Control Unit.

b. PRINTER - one Panasonic model KX-P1695.

2. PURPOSE.

The purpose of the evaluation testing is to verify that the equipment meets the requirements specified in sections C.1, C.3, and M.2(c)(1) of IFB Solicitation No. DTFA01-89-B-06588. Each function is evaluated and checked for discrepancies and/or failures in order to determine suitability for MDT procurement.

3. TESTING.

3.1 DATE.

The MDT Evaluation Testing was conducted from February 26, 1990 through February 28, 1990 and from March 8, 1990 through March 22, 1990.

3.2 LOCATION.

The MDT Evaluation Testing was conducted in the ACN-230 MDT Test Bed Laboratory at the FAA Technical Center, Atlantic City International Airport, N.J.

3.3 PARTICIPANTS.

The participants in the MDT Evaluation Testing were as follows:

a.	Y. Chiu	ACN-230
b.	C. Palmer	ACN-230/CTA
c.	K. Wideman	ACN-230/CTA

4. EVALUATION TEST RESULTS.

4.1 FCT1 - GENERAL TEST.

The FMDT general test sequence verifies some of the physical aspects of the FMDT as well as its compatibility with the required local area network (LAN) architectures.

4.1.1 FCT1 Results.

The Everex AGI 1800A unit passed all FCT1 test sequences.

4.2 FCT2 - HARDWARE TEST.

The FMDT hardware test sequence verifies the compatibility of the FMDT hardware with the MS-DOS operating system and with other similar machines.

4.2.1 FCT2 Results.

The Everex AGI 1800A unit passed all FCT2 test sequences.

4.3 FCT3 - SOFTWARE TEST.

The FMDT software test sequence verifies the ability of the FMDT hardware to correctly execute the required software suite.

4.3.1 FCT3 Results.

The Everex AGI 1800A unit achieved identical results to the earlier Everex AGI 1800 units in all FCT3 test sequences, and had the same exceptions as follows:

a. FCT3.9 - APL BY STSC (IFB C.1.1.1.B(k)).

1. Requirement: "The Fixed Maintenance Data Terminals shall properly execute the latest commercially available versions for IBM compatible microcomputers in general release as of March 1, 1988, of the following software: (k) APL by STSC."

2. Evaluation Result: The 24th and 25th lines of the display screen were not visible as expected. The 25th line is a reverse-video status line and is visible when the test sequences are executed on the IBM PC/AT and Compaq DeskPro 286 MDT Test Bed equipment. The 24th line is the last command/data display line, and information entered and/or displayed in it was visible when the test sequences were executed on MDT Test Bed equipment. The absence of these display lines did not produce an error or abnormal termination in program execution.

b. FCT3.15 - NORTON UTILITIES (IFB C.1.1.1.B(j)).

1. Requirement: "The Fixed Maintenance Data Terminals shall properly execute the latest commercially available versions for IBM compatible microcomputers in general release as of March 1, 1988, of the following software: (j) NORTON Utilities."

2. Evaluation Result: The Norton Utility System Information (SI) did not run. This is a known bug of Norton Utilities which causes the program to hang most non-IBM personal computers (PCs) that have a math co-processor installed. The Everex AGI 1800A required re-booting to continue testing.

4.4 FCT4 - SYSTEM UNIT TEST.

The FMDT system unit test verifies the salient characteristics of the system architecture.

4.4.1 FCT4 Results.

The Everex AGI 1800A unit passed all FCT4 test sequences.

4.5 FCT5 - PORTS TEST.

The FMDT ports test verifies the salient characteristics of the system input/output ports.

4.5.1 FCT5 Results.

The Everex AGI 1800A unit passed all FCT5 test sequences.

4.6 FCT6 - KEYBOARD TEST.

The FMDT keyboard test verifies the salient characteristics of the system keyboard.

4.6.1 FCT6 Results.

The Everex AGI 1800A unit passed all FCT6 test sequences without exception; however, the following observation was made:

a. FCT6.3 - ASCII GENERATION (IFB C.1.2.C(c)): Entry of a null character (ASCII 000) produced no reaction from the system unit, although the chart used (Figure E-3 of the Test Procedures document) indicated an expected result of CTRL-@. Identical results were obtained when the key sequence was entered on all MDT Test Bed units.

4.7 FCT7 - DISPLAY AND CONTROLLER TEST.

The FMDT display and controller test verifies the salient characteristics of the system display capabilities.

4.7.1 FCT7 Results.

The Everex AGI 1800A unit passed all FCT7 test sequences.

4.8 FCT8 - HARD DISK TEST.

The FMDT hard disks test verifies the salient characteristics of the system mass storage device.

4.8.1 FCT8 Results.

The Everex AGI 1800A unit passed all FCT8 test sequences.

4.9 FCT9 - 5.25" DISK TEST.

The FMDT 5.25" disk test verifies the salient characteristics of the system 5.25" removable storage media capabilities.

4.9.1 FCT9 Results.

The Everex AGI 1800A unit passed all FCT9 test sequences.

4.10 FCT10 - 3.5" DISK TEST.

The FMDT 3.5" disk test verifies the salient characteristics of the system 3.5" removable storage media capabilities.

4.10.1 FCT10 Results.

The Everex AGI 1800A unit passed all FCT10 test sequences.

4.11 FCT11 - MODEM TEST.

The FMDT modem test verifies the salient characteristics of the system internal modem.

4.11.1 FCT11 Results.

The Everex AGI 1800A unit achieved identical results to the earlier Everex AGI 1800 units in all FCT11 test sequences, and had the same observations as follows:

a. FCT11.5.A INTERNAL MODEM, PROTOCOL SUPPORT (IFB C.1.2.H(g)(1)): The modem would not dial when set for 300 baud, 7 data bits, one stop bit and no parity. The modem would dial after changing the stop bits to 2, or using either odd or even parity with one stop bit. Once the connection was made with the receiving modem and the above settings were made, the data transferred successfully.

b. FCT11.8 INTERNAL MODEM, ERROR CORRECTING PROTOCOL (IFB C.1.2.H(h)): The internal modem's error correcting protocol is not described in the documentation supplied with the unit; however, the required information is provided in the vendor's bid proposal.

c. FCT11.9 INTERNAL MODEM, STANDARDS/SPECIFICATIONS (IFB C.1.2.H(g)(3) and (4): The internal modem's receive sensitivity and transmit level are not described in the documentation supplied with the unit; however, the required specifications are provided in the vendor's bid proposal.

4.12 FCT12 - POWER SUPPLY TEST.

The FMDT power supply test verifies the salient characteristics of the system power supply.

4.12.1 FCT12 Results.

The Everex AGI 1800A unit passed all FCT12 test sequences.

4.13 FCT13 - EXTERNAL CABLES AND SUPPLIES TEST.

The FMDT cable and supplies test verifies the existence and salient characteristics of the system connection hardware and the power controller.

4.13.1 FCT13 Results.

The Everex AGI 1800A unit passed all FCT13 test sequences without exception; however, the following observation was made:

a. FCT13.3 EXTERNAL CABLES (IFB C.1.2.J(b)(1): No 25-foot telephone cables were supplied with the Everex AGI 1800A units; however, the 25-foot telephone cables supplied with earlier Everex AGI 1800 units evaluated from July 19, 1989 through August 3, 1989 were used in their place.

4.14 FCT14 - DOCUMENTATION TEST.

The FMDT system documentation test verifies the existence and salient characteristics of the system documentation.

4.14.1 FCT14 Results.

The Everex AGI 1800A unit passed all FCT14 test sequences.

4.15 FCT15 - SYSTEM SOFTWARE TEST.

The FMDT system software test verifies the salient characteristics of the supplied operating system and utility software.

4.15.1 FCT15 Results.

The Everex AGI 1800A unit passed all FCT15 test sequences without exception; however, the following observation was made:

a. FCT15.3 SYSTEM SOFTWARE, DIAGNOSTICS (IFB C.1.2.L(c)): One of the AGI 1800A units produced a hardware failure that necessitated re-booting the unit when the diagnostic software was executed. The same test sequence was passed successfully by the other unit. Repeated execution of the test sequence produced identical results on both units. The test failure was attributed to a hardware malfunction.

4.16 FCT16 - RELIABILITY TEST.

The FMDT system reliability test assesses the ability of the system to meet the reliability requirements.

4.16.1 FCT16 Results.

The Everex AGI 1800A unit passed all FCT16 test sequences without exception; however, the following observation was made:

a. The documentation supplied with the Everex AGI 1800A unit does not supply mean-time-between-failure (MTBF) data; however, the required information is contained in the vendor's bid proposal.

4.17 FCT17 - MAINTAINABILITY TEST.

The FMDT maintainability test assess the ability of the system to meet maintainability requirements.

4.17.1 FCT17 Results.

The Everex AGI 1800A unit passed all FCT17 test sequences without exception; however, the following observation was made:

a. The documentation supplied with the Everex AGI 1800A unit does not supply mean-time-to-repair (MTTR) data; however, the required information is contained in the vendor's bid proposal.

4.18 PCT1 - PRINTER SALIENT CHARACTERISTICS TEST.

The printer salient characteristics test verifies the functional capabilities of the printer, its compatibility with the specified software, and its physical characteristics.

4.18.1 PCT1 Results.

The Panasonic KX-P1695 printer passed all PCT1 evaluation test sequences with the following exception:

a. PCT1.12 - PRINTER INTERFACE (IFB C.3.2(l)).

1. Requirement: "Interface through a Centronics compatible parallel printer port, and an RS-232-C serial port."

2. Evaluation Result: Two KX-P1695 printers were used during evaluation testing. The first unit passed parallel testing without exception. It was not, however, equipped with an RS-232C serial port. The second unit supplied on March 19, 1990 was equipped with a model KX-PS10 RS-232C serial interface. The second unit successfully passed the serial port testing. The second unit, however, could not be operated in parallel mode without removing the serial interface. As a result, the second unit was not retested using the parallel interface.

3. Recommendations: ACN-230 recommends that the KX-PS10 RS-232C serial interface be supplied with the KX-P1695 printer as an uninstalled option. Specific documentation/ instructions should be provided regarding the procedures for installing the serial interface on a KX-P1695.

During the course of testing, the following anomalies occurred that did not result in failure of the tests involved, but should be noted:

b. PCT1.3 - PRINTER SPEED (IFB C.3.2(c)).

1. Requirement: Print at least 180 characters per second (cps) in draft mode and 20 cps or higher in near letter quality mode.

2. Evaluation Result: The following two printer speed tests were performed in testing the printer's draft mode (the test sequence specified in PCT1.3 was passed successfully for near letter quality mode):

(a) PC LABS BENCHMARK SERIES, Release 4.02, Printer Speed Test Program: BENCH07, 10/18/86 version. The results of this test indicated a draft mode speed of 138 cps for the Panasonic KX-P1695.

(b) An alternative test procedure was developed and used to obtain printer speed. The printer's built-in self-test diagnostic routine was used to time the continuous printing function used for print head adjustment. The results of this test indicated an average speed in draft mode of better than 207 cps.

c. PCT1.16 - ALARMS (IFB C.3.2(p)).

1. Requirement: Provide an audible or visual alarm to notify the user for manual operations such as paper handling adjustments, ribbon changes, and out of paper conditions.

2. Evaluation Result: The alarm capability of the printer had the following differences from IFB specifications:

(a) There were no audible or visual alarms for paper handling adjustments. These features are not applicable to the Panasonic KX-P1695 printer, since the unit automatically handles various paper styles and sizes.

(b) There was no ribbon change alarm capability indicated in the provided documentation. This feature is not applicable to the Panasonic KX-P1695 printer, since the unit employs a continuous-spool, multi-strike fabric ribbon cartridge.

4.19 PCT2 - DOCUMENTATION.

The printer documentation test verifies the existence and salient characteristics of the printer manuals.

4.19.1 PCT2 Results.

The Panasonic KX-P1695 printer passed all PCT2 test sequences without exception; however, the following situation was observed during testing:

a. PCT2.2 - DOCUMENTATION (IFB C.3.3(b)).

1. Requirement: "One each of the following manuals or other forms of documentation equivalents shall be provided with each microcomputer system. ... (b) Equipment Manuals. Set up instructions and technical specification."

2. Evaluation Result: A separate equipment manual for the printer was not provided. Instead, the set up procedures and technical specifications are included in the Operating Instructions manual.

4.20 PCT3 - RELIABILITY.

The printer reliability test assesses the ability of the printer to meet the specified reliability requirements.

4.20.1 PCT3 Results.

The Panasonic KX-P1695 printer did not pass all PCT3 test sequences due to the following exception:

a. PCT3.1 - RELIABILITY (IFB C.3.3.4(a)).

1. Requirement: "The manufacturer's specified reliability figures for the printer shall meet or exceed the following: (a) Device - 5 million lines/1000 hours of operation."

2. Evaluation Result: The manufacturer's Operating Instructions manual for the KX-P1695 does not provide MTBF data.

3. Recommendations: ACN-230 recommends that either a product brochure or supporting documentation which specifically addresses reliability expressed in terms of lines per hour of operation for the Panasonic KX-P1695 printer be obtained. This information is required to verify MTBF specifications.

4.21 SCTF1 - COMBINED EQUIPMENT SYSTEM (FMDT) SOFTWARE TEST.

The SCTF1 software test sequence verifies the ability of the FMDT and printer hardware to correctly execute the required software suite.

4.21.1 SCTF1 Results.

The combined Everex AGI 1800A FMDT and printer units achieved identical results to the earlier Everex AGI 1800 units in all SCTF1 test sequences, and had the same exceptions noted as follows:

a. SCTF1.9 - APL BY STSC (IFB M.2(c)(1)b.6).

1. Requirement: "... the FMDT and PMDT, including printer will be tested as a system to demonstrate the capability to execute, respond to, and function with, the most current version (in general release as of March 1, 1988) of the following software in respect to functionality and performance: 6. APL by STSC."

2. Evaluation Result: As in the FMDT stand-alone test sequence FCT3.9, the 24th and 25th lines of the display screen were not visible as expected. Refer to paragraph 4.3.1.a.2 for additional information.

b. SCTF1.15 - NORTON UTILITIES (IFB M.2(c)(1)b.11).

1. Requirement: "... the FMDT and PMDT, including printer will be tested as a system to demonstrate the capability to execute, respond to, and function with, the most current version (in general release as of March 1, 1988) of the following software in respect to functionality and performance: 11. NORTON Utilities."

2. Evaluation Result: As in the FMDT stand-alone test sequence FCT3.15, the Norton Utility SI did not run. Refer to paragraph 4.3.1.b.2 for additional information.

During the course of testing using the combined equipment, the following anomaly occurred that did not result in failure of a test, but should be noted:

5. OTHER RESULTS.

The RS-232C serial port is not initialized during execution of the power-up sequence for either the Everex AGI 1800A or 1800. As a result, output cannot be directed from the Everex AGI 1800A/1800 to the printer (LPT1) through the serial port (COMx). Output can only be directed to the printer through the serial port once a command has been issued to initialize the port. Specific instructions to initialize the serial port are not required when used as a system printer connected to the Maintenance Processor Subsystem (MPS).

5.1 OTHER RECOMMENDATIONS.

ACN-230 recommends installation of the printer serial interface only if the printer is to be used as an MPS system printer. If the printer is to be used in combination with an Everex AGI 1800A or 1800, then the parallel printer port should be used.