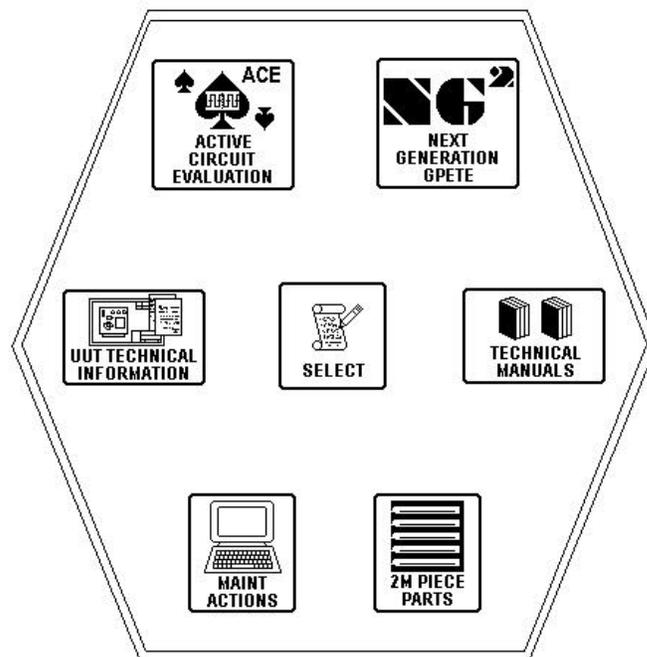


AN/PSM-93(V) Computer Test Set *User's Guide*



AN/PSM-93(V)

Computer Test Set

User's Guide

Version 1.3

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SECTION 1 INTRODUCTION

1.1 Purpose. This guide is designed for the everyday user of the **AN/PSM-93(V) Computer Test Set**. It will lead the user through the various application programs as well as minor system maintenance. This guide was written for someone using the AN/PSM-93(V) who has little or no knowledge of computers. An intermediate or advanced user may not need this user's guide except for referencing the system setup and parameters. This guide incorporates information and programs designed specifically for the AN/PSM-93(V) by the Crane Division of the Naval Surface Warfare Center (Code 6037), Crane, IN, and other commercial software.

1.2 AN/PSM-93(V) Description. The AN/PSM-93(V) Computer Test Set, is essentially a **Portable Maintenance Aid (PMA)** whose main components are the **Active Circuit Evaluation (ACE)** software package, and **Next Generation GPETE (NG²)** instrumentation hardware. It was designed and developed to function as a powerful suite of integrating test software and PC based test instrumentation. Although the main focus is on PC based instruments, the test set can be configured to control and provide for the utilization of other test hardware such as **VXI, IEEE**, and standard bench top **General Purpose Electronic Test Equipment (GPETE)**, as well as to be incorporated into, and work in conjunction with, other **Automatic Test Equipment (ATE)**. The AN/PSM-93 can also function as a self-contained paperless storage and retrieval system, allowing access to thousands of pages of information, drawings, and test information stored on CD-ROM, such as Interactive Electronic Technical Manuals (IETMs).

1.3 AN/PSM-93(V) Purpose and Test Philosophy. The purpose of the AN/PSM-93(V) is to aid test, repair, and maintenance personnel in the efficient and intelligent performance of their duties by providing them with a highly portable, yet powerful combination of test instrumentation, reference waveforms, measurement data, and technical documentation bundled together in the form of **Signal Evaluation Sets (SESSs)**. The SESSs are comprised primarily of **Unit Under Test (UUT)** Technical Information and UUT Reference Waveforms. The UUT Technical Information is specific to the UUT and is comprised of, at minimum, UUT SCHEMATIC DIAGRAMS, a UUT LAYOUT DRAWING, and a UUT PARTS LIST. The UUT Reference Waveforms can be either AC or DC waveforms collected from user specified points or nodes in a given circuit, electrical assembly, system, or sub-system, with a PC based storage oscilloscope.

The test philosophy employed in the AN/PSM-93(V) via the Active Circuit Evaluation (ACE) software package is as follows: UUT Reference Waveforms are to be collected from a known good UUT or system that is operating in a known, repeatable, and technically relevant, power-on state. These stored, or "golden" reference signals will then be utilized by the users as baseline test signals to compare with the signals taken from a failed or suspect UUT. By comparing these reference signals collected from a known good UUT to those of a failed or suspect UUT, the operator should be able to locate, isolate, and repair failures present on the failed UUT.

1.4 AN/PSM-93(V) User's Guide Overview. The AN/PSM-93(V) User's Guide is broken down into sections based on the AN/PSM-93(V)'s OPENING SCREEN and the areas to which it sends the user. Some sections consist of helpful information pertaining to troubleshooting problems encountered while using the AN/PSM-93(V). If the user still has difficulty with the AN/PSM-93(V), Section 1.11 contains support personnel contact information.

1.5 Computer Requirements. Listed below are the **recommended minimum** computer requirements for the AN/PSM-93(V):

Computer Configuration, Software

Microsoft MS-DOS 6.0.2

Microsoft Windows 3.11

Computer Configuration, Hardware

| | |
|---------------------------|---------------------------------|
| 80486DX4 PC (100MHz) | 2 serial ports, 1 parallel port |
| 16MB RAM (1MB Video RAM) | 101 key extended keyboard |
| 1024x768, 256 color VGA | CD-ROM drive |
| 500MB hard disk drive | external VGA port |
| 3.5", 1.44MB floppy drive | |
| mouse, or pointing device | |

1.6 AN/PSM-93(V) Software. The following software media will be supplied and installed into each AN/PSM-93(V) assigned to fleet activities:

- a. CD-ROM: **M-31170**, AN/PSM-93(V), Computer Test Set
- b. 5¼" Diskette: Digital Multimeter Software Installation Disk (5½ Digit DMM Control Software)

1.7 Mouse. The AN/PSM-93(V) is primarily a Windows® based system. This means that to run the AN/PSM-93(V), the operator uses a mouse to point to an application icon (a picture representing the application) he or she wishes to access and then clicks on the icon to run the application. Table 1 below lists the definitions of terms applicable to using a mouse.

1.8 Graphical User Interface (GUI). The AN/PSM-93(V) uses graphics (pictures) to interface the user with the computer. The AN/PSM-93(V) uses small pictures, called icons, to represent applications and functions. To access these applications an AN/PSM-93(V) operator moves (points) the mouse cursor over an icon and clicks on it. The application will then run. The AN/PSM-93 uses Microsoft® Windows® as the GUI. Open PROGRAM MANAGER by double clicking on the icon, or press and hold the ALT then press and release the TAB key until the program manager appears, then release ALT and TAB. To return to the AN/PSM-93(V) opening, click on the AN/PSM-93(V) icon. For systems configured with Windows 95®, double-click on the AN/PSM-93 icon from the Windows Desktop.

| <u>Term</u> | <u>Meaning</u> |
|--------------|---|
| Click | To quickly press and release the mouse button. |
| Double-click | To click the mouse button twice in rapid succession. |
| Drag | To press and hold down the mouse button while you move the mouse. |
| Point | To move the mouse until the mouse pointer on the screen is over the item of choice. |

Source: *Microsoft® Windows® Operating System 3.1 User's Guide*, page 56.

Table 1. Mouse Terms

1.9 HELP. The AN/PSM-93(V) contains on-line help for most applications. Much of this manual was derived from this help information. To access help, point to and click on the HELP Command on the AN/PSM-93(V)'s MENU BAR, or press the F1 key.

AN/PSM-93(V) User's Guide

1.10 Conventions. Some of the procedures herein require some form of user input. To help in the usage of this guide several conventions for user input were established:

| | |
|---------------|---|
| Bold | Type the command and switches, if any, <i>exactly</i> as printed, then followed by pressing the ENTER key. <u>Example</u> : To display a disk directory the user would be directed to type DIR (followed by pressing the ENTER key). |
| <i>italic</i> | Information that the operator must provide. <u>Example</u> : To print a user unique file, the user would be directed to type Print filename (followed by pressing the ENTER key), in this case the user would type his or her file name, such as MYFILE.DOC. |
| ALL CAPITALS | Names of keys, icons, directories and files. <u>Examples</u> : ENTER key, PREV MENU icon, C:\DOS directory, and AUTOEXEC.BAT file. |
| KEY1+KEY2 | This plus sign (+) means the keys must be pressed at the same time. <u>Example</u> : When the user is directed to press CTRL+ALT+DEL, he or she would press and hold the CTRL (control) key and ALT (alternate) key and then press the DEL (delete) key. |
| KEY1, KEY2 | The comma (,) means the keys must be pressed in order. <u>Example</u> : The user may be directed to press ALT, F3, this means he or she would press then release the ALT key, immediately followed by pressing the F3 key. |

1.11 AN/PSM-93(V) Support. Any questions or modifications pertaining to the AN/PSM-93(V), or the AN/PSM-93(V) User's Guide, may be directed to the AN/PSM-93(V) Technical Representative:

COMMANDER
Phil Hoffsetz, Code 6037, Bldg 2917
NAVSURFWARCENDIV
300 Highway 361, Crane, IN 47522-5001
812-854-1708 FAX: 812-854-1972
hoffsetz@homer.crane.navy.mil

Any changes or additions to the AN/PSM-93(V) will be accompanied by changes to the User's Guide. The changes will come with written instructions for the installation of any software and manual changes.

SECTION 2

INITIALIZATION AND TEST RESOURCE SELECTION

2.1 AN/PSM-93(V) Initialization. Once power is applied to the computer platform for the AN/PSM-93(V), the unit will undergo a series of system, and Random Access Memory (RAM) self-checks. If the computer successfully passes these checks, it will continue to process system configurations and set-up procedures through the CONFIG.SYS and the AUTOEXEC.BAT files. Finally, after entering Windows®, the computer will either display the AN/PSM-93(V) OPENING SCREEN, allowing the user access to various programs and information files, or the user will have to select the AN/PSM-93 software by clicking on the appropriate icon in Windows. Figure 1 below is the AN/PSM-93(V)'s Opening Screen. If the Opening Screen fails to appear, at the DOS prompt (C:\) type in **WIN**, then double-click on the AN/PSM-93(V) icon in the AN/PSM-93(V) folder in Windows (or on the Desktop in WIN '95). If the opening screen still doesn't appear, refer to Section 7 for Troubleshooting Tips.

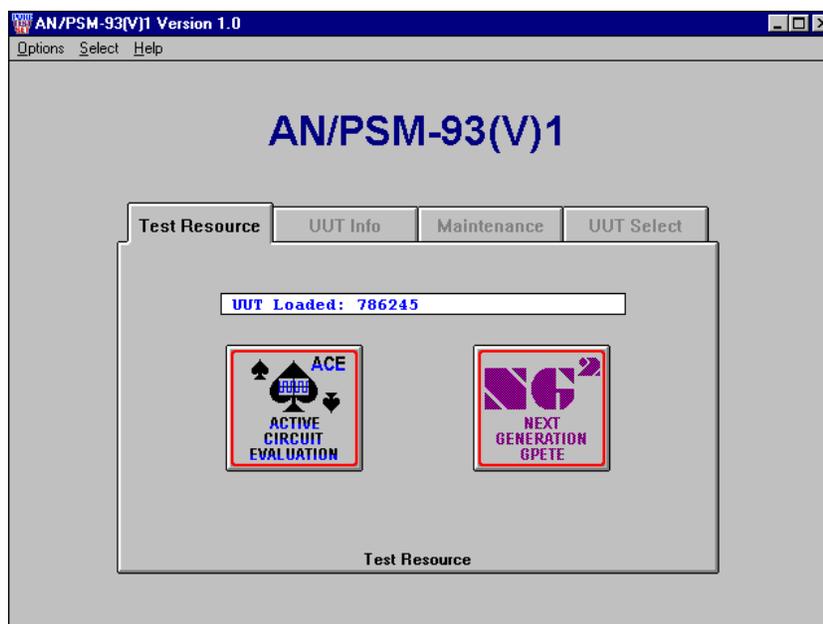


Figure 1. AN/PSM-93(V) Opening Screen

2.2 Select Test Resource. To fully utilize the AN/PSM-93(V), the operator must first decide how it will be used. The NG² test instrumentation, housed internally in the PC, may be used either in conjunction with the ACE software package, or as stand-alone test instrumentation. Conversely, the ACE software can be used with the PC based NG² test hardware, or with other test instrumentation such as VXI, IEEE, or conventional bench-top General Purpose Electronic Test Equipment (GPETE). The AN/PSM-93(V) can also be utilized to control, or work in conjunction with other ATE or test resources. The UUT that the operator is concerned with may be supported by a variety of equipment or ATE. When a UUT is selected, the Test Resources available for that UUT will be listed in the UUT INFORMATION box at the bottom of the SELECT screen. Upon selection, the software, setup instructions, etc., needed to run to the test and equipment for the selected UUT will all be downloaded and made ready for use by the operator.

EXAMPLE: If the operator selects UUT Part Number 31771122, which is a UUT from the OJ-326, he or she will see the information for this UUT displayed in the UUT Information Box, and the AN/PSM-93 will be listed as the available Test Resource used (see FIGURE 3 below). If the operator desired to use the NG² oscilloscope as a stand-alone instrument to evaluate this UUT, rather than the existing Signal Evaluation Set (SES), he or she would go to the TEST RESOURCE folder and click on the NG² icon to use the scope in a stand-alone mode (see FIGURE 12).

2.2.1 Using the mouse, point the cursor to the folder tab labeled UUT SELECT and click the left mouse button (if the UUT SELECT folder is not already selected). (Ball point mouse uses the top mouse button).

2.2.2 At the UUT SELECT folder, move the cursor to the icon labeled SELECT and click on the left mouse button. (See Figure 2, UUT Select Screen, below).

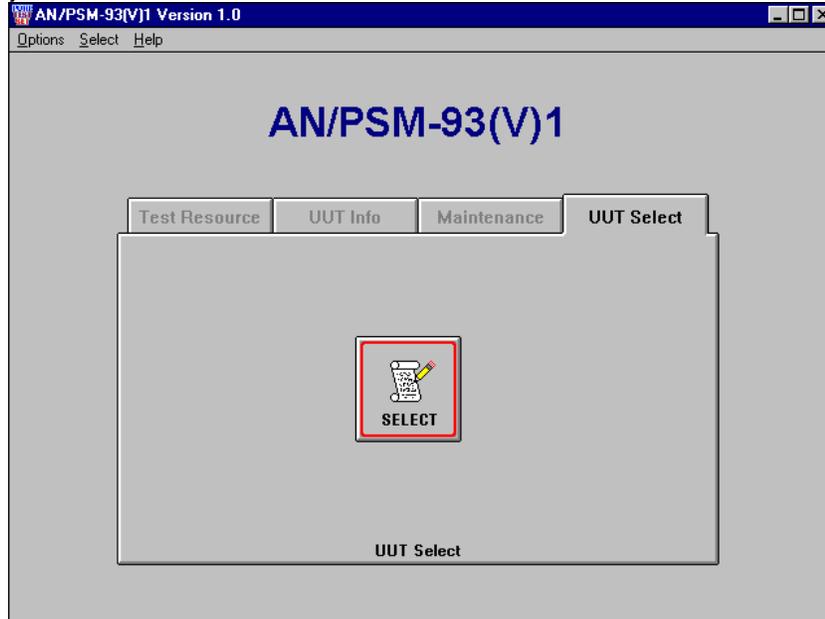


Figure 2. UUT Select Screen

2.2.3 Wait for the UUT Select Screen to appear. The Unit Under Test (UUT) list can be sorted by UUT Part Number, by Weapons System, or by Test Resource by clicking the appropriate choice near the top of the window. Select the pertinent item to test by using the scroll bar on the right side of the listing, or by typing the appropriate Part Number, Weapons System, or Test Resource information directly into the window area provided. Once the Part Number to test is found, highlight by single clicking on it. With the arrow, single click the SELECT button in the upper right corner. Click on help for general AN/PSM-93(V) information. Click on CANCEL to go back to the AN/PSM-93(V) opening screen. Future Test Resource updates, or user developed tests may reside on floppy disks, and the user can then use the LOAD FROM FLOPPY option to load them. (See Figure 3, Resource Selection Screen, below).

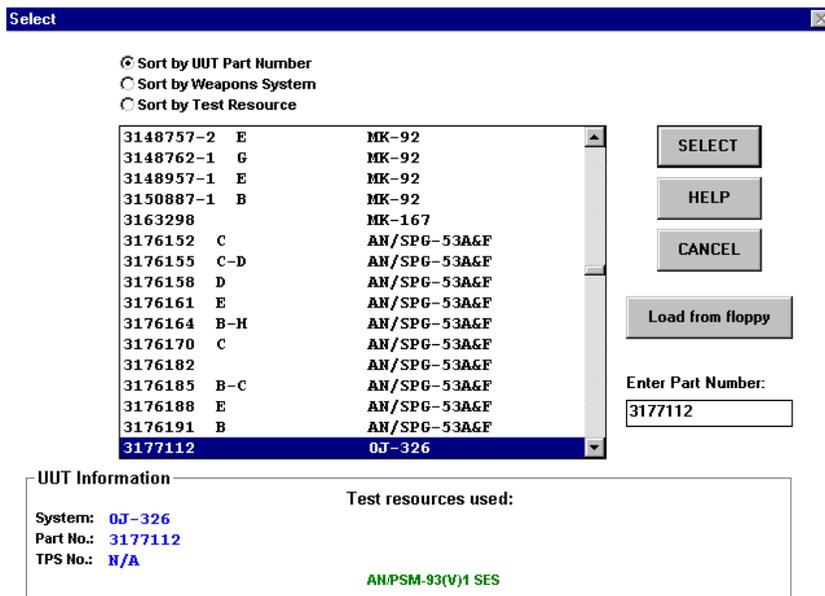


Figure 3. Resource Selection Screen

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2.2.4 After clicking on the SELECT button, wait until all the Test Resource files have been loaded for use. The AN/PSM-93(V) screen will reappear and reflect the Part Number the operator selected in the UUT LOADED window, found on the TEST RESOURCE folder. All Test Resources that can be used to test the UUT will have icons present on the TEST RESOURCE folder following this data download.

NOTE: A minimum of 100 Megabytes (100 MB) of the system's hard disk space must be maintained at all times to ensure that adequate room will be available for these downloads from the CD-ROM.

2.2.5 At this point, the user can either view the UUT TECHNICAL INFO, or use the applicable test equipment or resource (See Section 3).

SECTION 3

SUPPORT DOCUMENTATION AND TESTING

3.1 UUT Technical Information. To select this option, select the UUT INFO folder and click on the UUT TECHNICAL INFORMATION icon. This option allows the operator to choose the type of document to be viewed. The documents available pertain only to the Test Resource most recently selected, as described in paragraphs 2.2.4 and 2.2.5 above. (See Figure 4, UUT Information Screen, below).

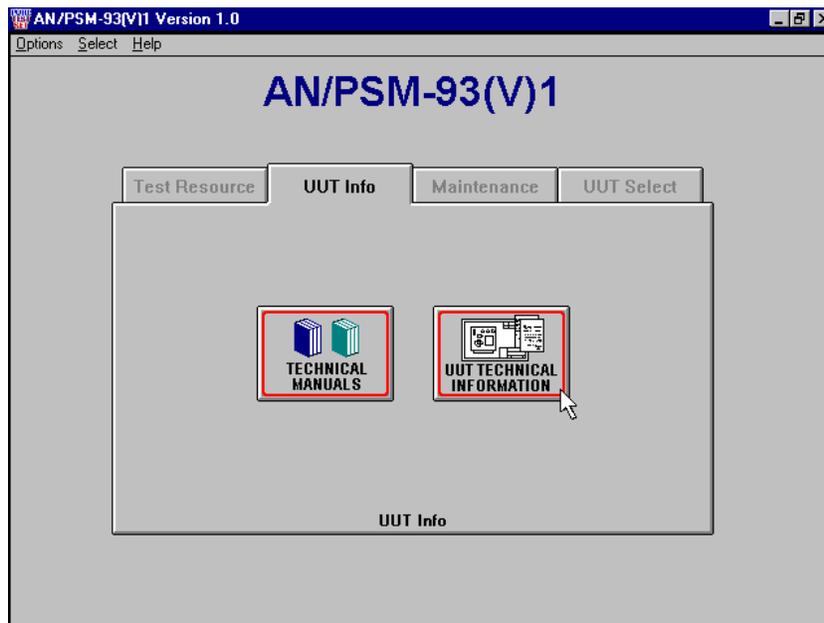


Figure 4. UUT Information Screen

3.1.1 UUT Technical Information that is specific to the selected UUT includes: the LAYOUT DRAWING, the PARTS LIST, the SCHEMATIC/LOGIC DIAGRAM, FAULT INFORMATION (if applicable), REVISION INFORMATION, and TESTING NOTES (if available).

3.1.2 To display an item found in UUT Technical Information, click on the Icon for that item. (See Figure 5, UUT Technical Information, below)

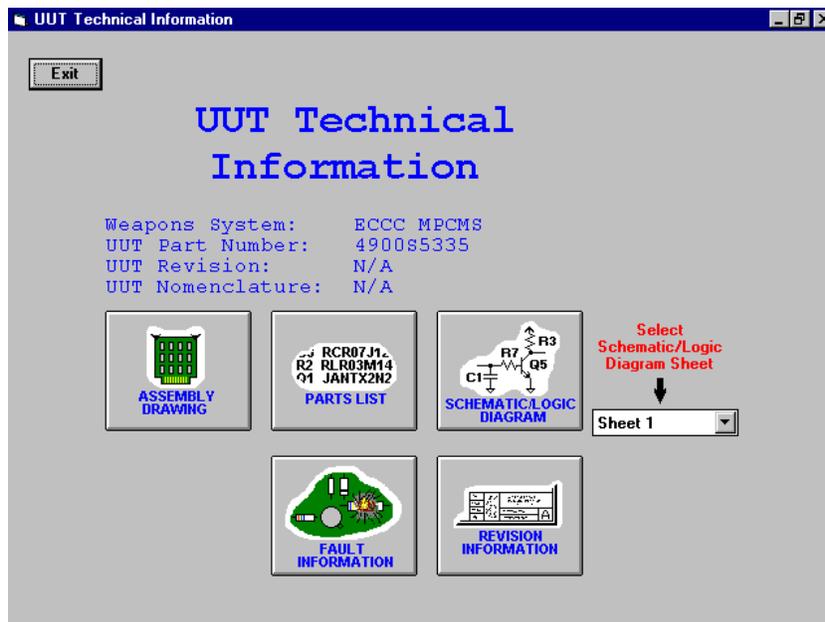


Figure 5. UUT Technical Information Screen

3.2 Layout Drawing. Parts Layout Drawing of the UUT. The scroll bar on the right can be used to move up/down to view all of the Layout Drawing. The ZOOM IN/OUT buttons can also be used to adjust the display of the drawing.

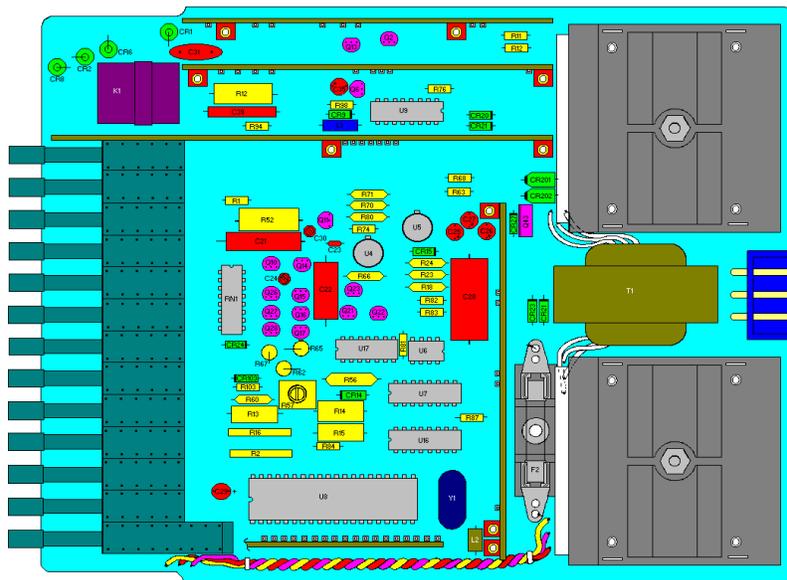


Figure 6. UUT Layout Drawing Screen (C:\TESTER\LAYOUT.PCX)

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3.3 Schematic Diagram. Users can zoom in and out on the drawing by clicking on the ZOOM IN or ZOOM OUT buttons along the bottom of the screen. You can also zoom on an area of the schematic by moving the cursor to the area you are interested in and holding the left mouse button down and dragging to another area. This will enlarge the portion of the Schematic in that window, to the size of the monitor screen. To return the Schematic to 100% view, click on the RESET VIEW button at the bottom of the screen. Multiple Schematic Sheets can be viewed for instances where the UUT has more than one Schematic page. Exit the screen by clicking on EXIT. (See Figure 7, UUT Schematic Diagram, below).

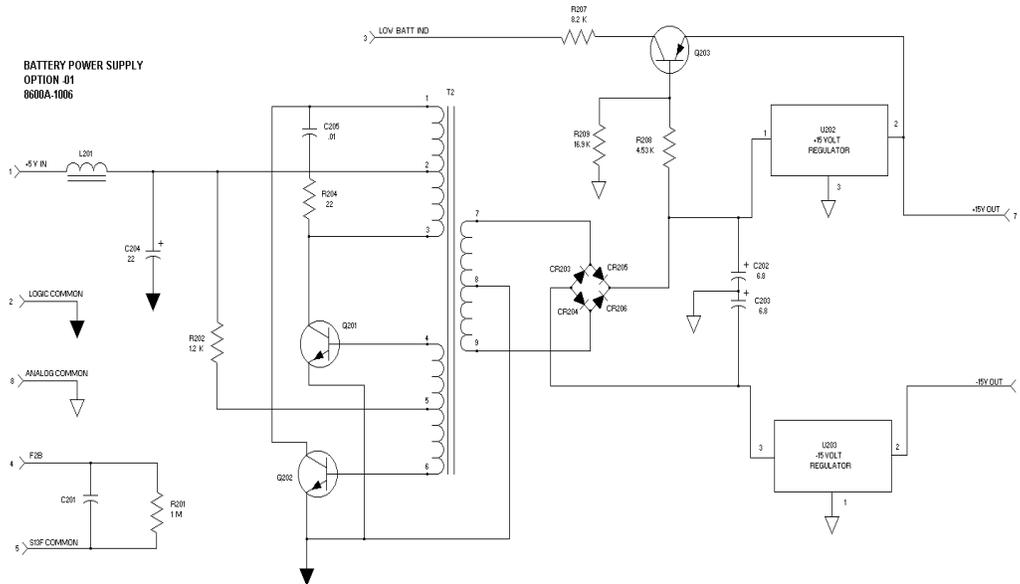


Figure 7. UUT Schematic Diagram Screen (C:\TESTER\GRAPH01.PCX)

3.4 Parts List. This is listed by Reference Designator, Part Number and NSN (when available). Use the scroll bar on the right to move up/down to view all of the Parts List. Exit the screen by clicking where instructed.

3.5 Revision Information. When available, this option displays general UUT information such as: Weapon System, Part Number, Revision, Nomenclature, NSN, Developing Activity, Date Approved, Test Resource Number, etc. Exit the screen by clicking where instructed.

3.6 Testing Notes. When available, Testing Notes are provided to convey special or necessary instructions to the user for the setting up and testing of the UUT. Exit the screen by clicking where instructed.

3.7 Testing a UUT via the Signal Evaluation Set (SES). Once all of the support files for the UUT have been downloaded via the UUT Select process described in paragraphs 2.2.2 and 2.2.3, and viewed as desired by the operator, testing of the UUT can begin. At the TEST RESOURCE folder, click on the Active Circuit Evaluation (ACE) icon. (See Figure 8, Test Resource Screen, below). This will take the operator to either a schematic or block diagram of the assembly or system under test. From this schematic or block diagram the operator will either be guided through a step-by-step testing or troubleshooting process, or will make his or her own decisions as to the order of test. This depends on the nature and type of SES developed for the selected UUT. (See paragraph 1.3 for SES description)

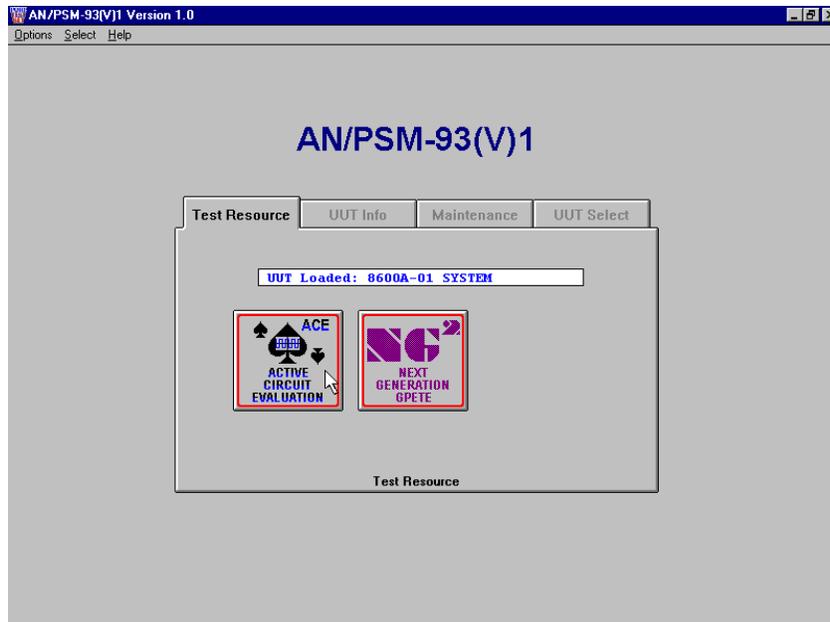


Figure 8. Test Resource Screen.

For automated testing where the order of test has already been established, the operator is to follow all directions and prompts from the system to complete the testing of the UUT.

For SESs not guiding the operator through an automated sequence, the components or circuit points to be tested are selectable from either the listing found at the left side of the schematic/block diagram screen, or by clicking directly on the drawing itself. (See Figure 9, ACE Schematic Diagram, below).

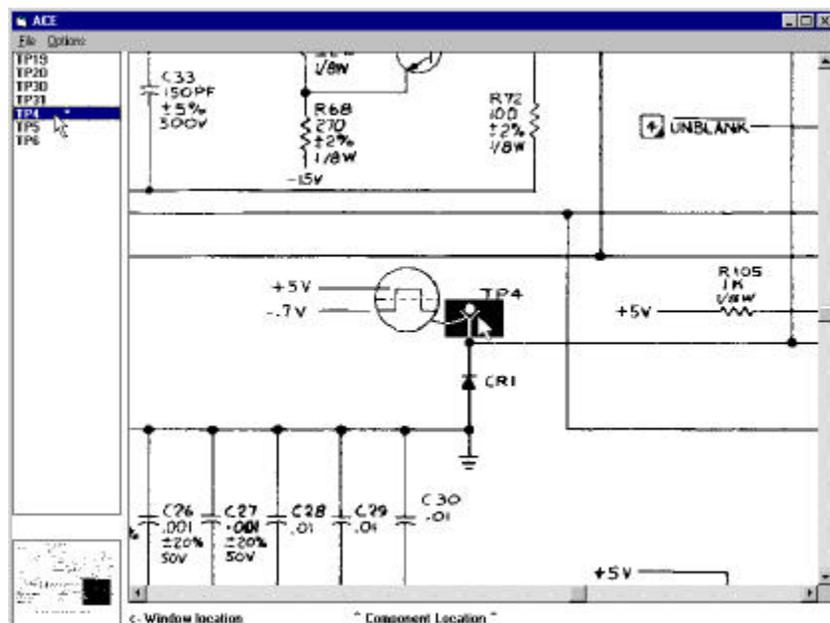


Figure 9. ACE Schematic Diagram Screen

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After selecting the component or point to be tested, the ACE software will then go to the Layout Drawing for the item. The selected component or point will be depicted on the Layout Drawing, with the specific point to be probed pointed out. (See Figure 10, ACE Layout Drawing, below). At this stage the operator can either perform a test of this component or point by doing a comparison of it's stored waveform, or return to the schematic/block diagram.

This sequence of events: selecting the point or component to test, viewing it's pinout and location on the Layout, and testing it by stored-to-live waveform comparison, is repeated by the operator until the testing session is completed for the selected UUT.

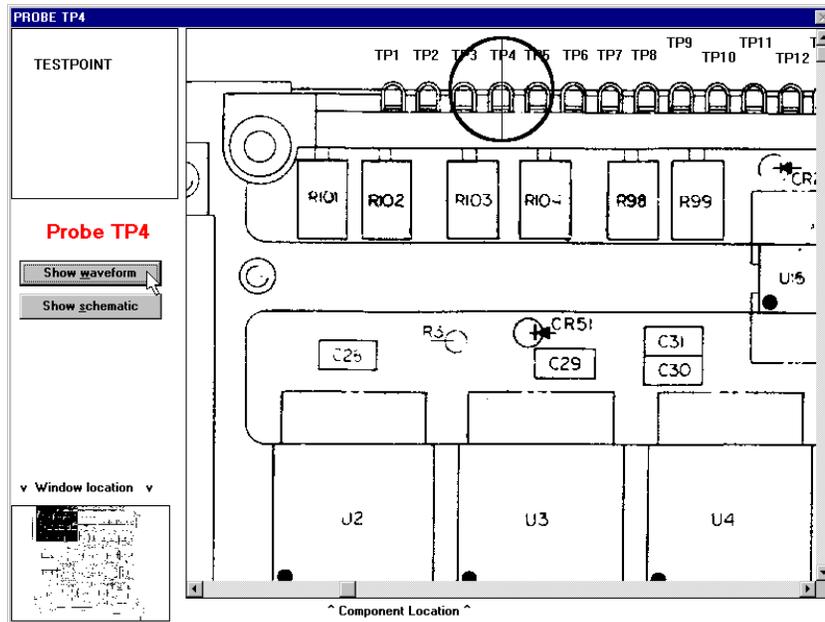


Figure 10. ACE Layout Drawing Screen

3.8 Using the NG² Test Instruments in Stand-Alone Mode. To utilize the OS-301(P)/PSM-93(V) Oscilloscope and the ME-569(P)/PSM-93(V) Digital Multimeter in Stand-Alone mode, that is as independently functioning instruments not utilized in a AN/PSM-93 SES, go to the Test Resource folder and click on the Next Generation GPETE (NG²) icon. The system will present a screen allowing the operator to choose to use either the Oscilloscope, or the Multimeter for use as General Purpose Electronic Test Equipment (GPETE). Refer to the manufacturer's technical documentation for these instruments for guidance on their use in Stand-Alone mode. (See Figure 12, NG² Instruments Stand-Alone Selection, below).

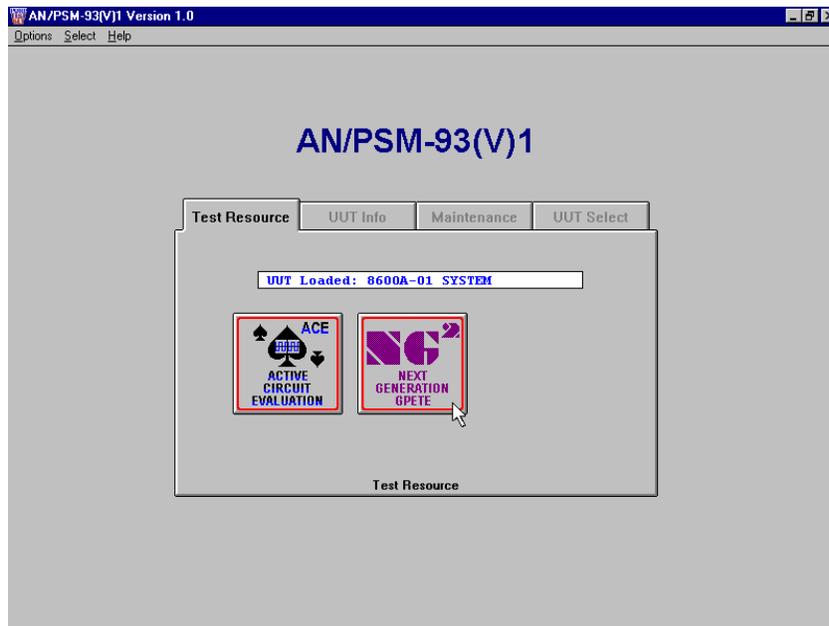


Figure 11. NG² Instruments Selection Screen

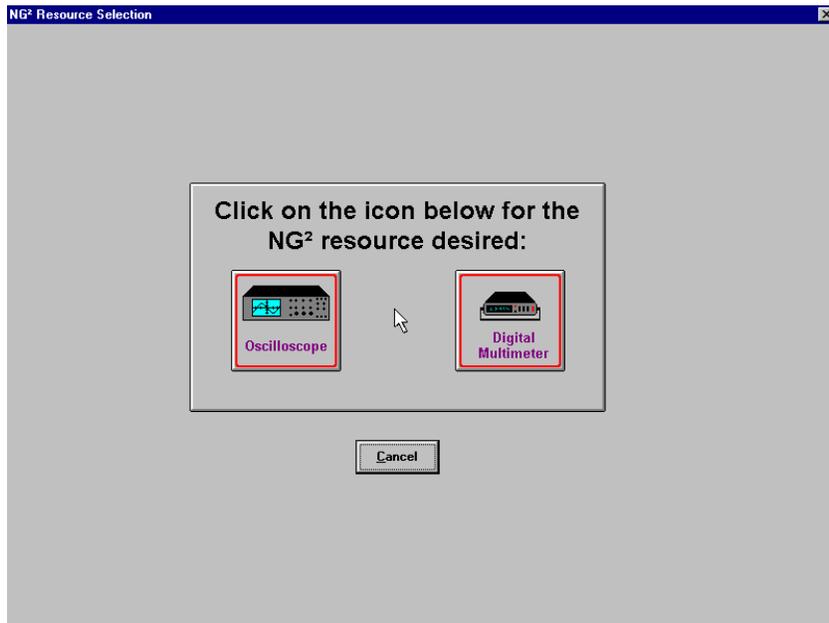


Figure 12. NG² Instruments Stand-Alone Selection Screen

SECTION 4

2M PIECE PARTS

4.1 Introduction. NAVSEA/NAVSUP, in an effort to provide logistic support for the deployed 2M Repair station has developed, by Ship Class, a generic electronic Piece Parts, and consolidated them into kits.

4.1.1 These hull-tailored cabinets are outfitted with electronic repair parts identified as relatively low cost (under \$50 each)/high demand items supporting a wide variety of electronic systems such as radar, communication, sonar, etc. These items range from 1400 to 3400 individual resistors, capacitors, transistors, semiconductors, and microcircuits all supplied in support of the 2M Repair Site.

4.1.2 The generic Piece Parts kits for shipboard application are assembled into modular drawer storage VIDMAR cabinets. The cabinet dimensions are fifty nine inches high, twenty two and a half inches wide, and twenty seven and three quarters inches deep, having seventeen drawers with thirty two compartments in each. The cabinets are protected with a coat of Electrostatic Discharge Sensitive (ESDS) paint to aid in the protection of stored components from ESD damage, and are grounded via a grounding strap supplied as additional protection.

4.1.3 The 2M Piece Parts (2MPP) Automated Inventory System is designed to allow the fleet-user swift, easy access to the 2M Piece Part Data Base. The data base contains a complete listing of the 1400-4500 line items stored in the 2MPP Inventory. The parts are listed by National Item Identification Number (NIIN), Part Number (PN), Nomenclature (NOMEN), and VIDMAR Location. The Quantity (QTY), and HI Quantity (HIQTY) are included in the listing. In the event that the AN/PSM-93 is utilized by customers not using the 2MPP database, other database inventories can be incorporated for use in place of this 2MPP software.

4.2 Operation. To access the 2MPP database, point and click on the 2M PIECE PARTS icon from the AN/PSM-93(V) MAINTENANCE folder. The BROWSE BY NIIN window will open and the operator can use the scroll bars or arrow keys or scroll through the database. (See Figure 14, 2MPP Screen, below)

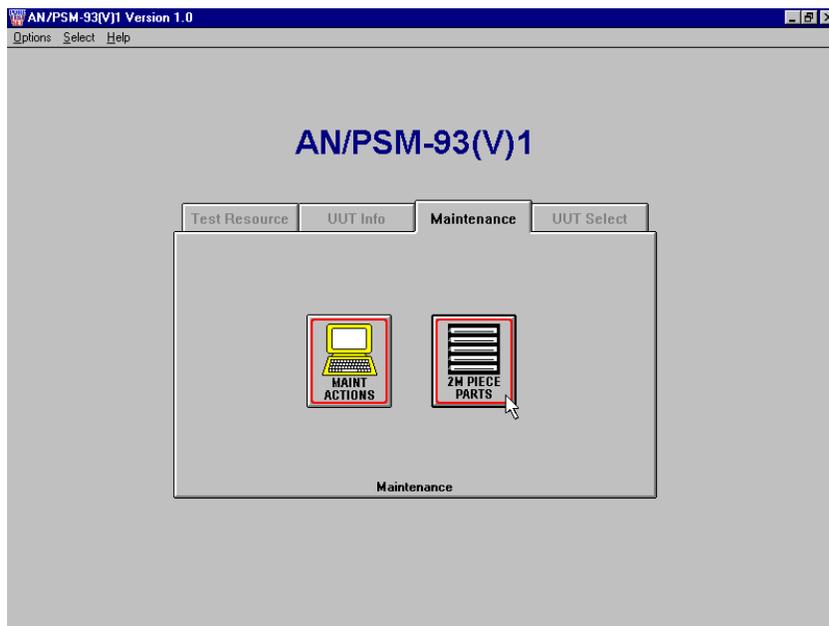


Figure 13. 2M Piece Parts Screen

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4.2.1 Browse. To browse by a different sequence, (Part Number, Nomenclature or cabinet location), single click on BROWSE in the menu bar and single click on the sequence you wish to browse.

4.2.2 Find. To find a specific part, single click on FIND in the menu. Then single click on the type of search you want to initiate (NIIN, PART NUMBER, NOMENCLATURE, or CABINET LOCATION). A window will open and allow the operator to enter the parameter to search on. Once the data is entered, single click on OK to begin the search. If no match is found a message will appear and inform the operator to try the Master Cross Reference List (MCRL), unless the search was on a part number. If the search was on a part number and an exact match was not found, the program will automatically search the 2M Piece Part cross-reference database and display any parts that cross-referenced to the original part number that was entered.

4.2.3 Change. To change an item in the database single click on CHANGE in the menu bar, and then single click on the desired change (ADD, CHANGE, DELETE, CHANGE AEL). To add an item single click on ADD and a window will open that will allow the operator to add an item to the database. To change an item you must first highlight one field (NIIN, PN, NOMENCLATURE, etc.) in the database by single clicking, and then select CHANGE ITEM from the Change menu. The highlighted item will now be shown in a window and changes can be made to any field except NIIN. *This option should be used when a part is taken from the Piece Parts cabinet to show the change in quantity and any comments.* To delete an item you must first highlight one field (NIIN, PN, NOMENCLATURE, etc.) in the database by single clicking and then select DELETE ITEM from the Change menu. To prevent accidental deletion the operator will be asked twice to confirm that the record is to be deleted.

4.2.4 Print. This option allows the operator to print a single item, the entire contents of the database by sequence, the cross reference window, or the log window. To print, single click on the PRINT MENU bar. (refer to the owner's or user's manual for the AN/PSM-93(V) ruggedized PC platform, in this case the FieldWorks FW7600, for instructions on interfacing printers to the computer). To print a single item you must first highlight one parameter (NIIN, PN, NOMENCLATURE etc.) in the database by single clicking and then select SINGLE ITEM from the Print menu. To print the entire contents of the database single click on the desired sequence (NIIN, PART NUMBER, NOMENCLATURE, LOCATION) from the PRINT MENU. If the cross reference window is open, the operator may print it by selecting CROSS REFERENCE from the PRINT MENU. If the log file (see below) contains any information, it can be printed by selecting 2MPP LOG from the PRINT MENU.

4.2.5 Log. If the operator has more than one part to reference, a log file can be created by single clicking on the LOG MENU option. To add an item you must first highlight one parameter (NIIN, PN, NOMENCLATURE, etc.) in the database by single clicking, and then select ADD from the Log menu. To delete an item you must first select BROWSE from the Log Menu. Then highlight one parameter (NIIN, PN, NOMENCLATURE, etc.) in the Browse Window by single clicking, and then select DELETE from the Log menu. To clear all information from the log file single click on CLEAR from the Log menu. The information in the log file will be cleared every time the 2M Piece Part database is entered.

4.2.6 Window. If more than one window is open this option will allow both windows to be seen at the same time. Use this option if a window is hidden by another.

4.2.7 Exit. To exit, single click on EXIT in the menu bar and then single click on YES in the Exiting window.

SECTION 5

TECHNICAL MANUALS

5.1 General. This option allows the operator to view several different existing technical manuals. The manuals include system maintenance manuals on the AN/TSM-192 TAT and the AN/USM-465 PSP, 2M Repair Manuals such as PP8087, the Master Test Program Set Index (MTPSI), and various combat system technical manuals. Additional Navy or customer electronic or Interactive Electronic Technical Manuals (IETMs) can also be incorporated in this feature. The current library is broken up into sections, according to the type of manual.

5.2 Operation. To access the Technical Manuals point and click on the TECHNICAL MANUALS icon from the AN/PSM-93(V) UUT INFO folder. The screen will then display icon representations of the manual sections available to the operator. Click on one of these icons to show the actual manuals available in that section. Once in the library, more detailed Help is available to the operator, as well as instructions on how to exit the library and return to the AN/PSM-93(V) UUT INFO folder.

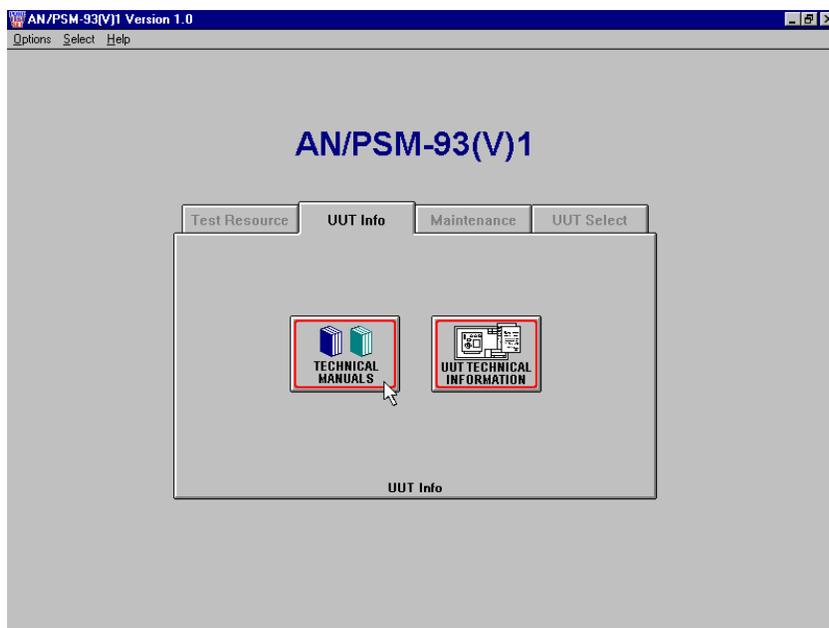


Figure 14. UUT Technical Manuals Screen

5.3 Exit. To return to the Opening Screen, point and click on the EXIT icon in the upper left hand corner. To return to the Icon Screen from one of the technical manuals, point and click on the CLICK HERE TO RETURN TO MAIN MENU icon in the lower left hand corner.

SECTION 6

MAINTENANCE ACTION

6.1 Maintenance Action. Maintenance Action is the option that allows the operator to enter information into the AN/PSM-93(V) about the maintenance actions performed on a UUT.

6.1.1 The MAINTENANCE ACTION icon allows the operator to input and maintain a local 2KILO database. This mode can be used to electronically fill out a 2KILO form based on UUT repair information, and at a later point in time edit, update, or store the information on a diskette. To access the 2KILO database point and click on the MAINT ACTION icon from the AN/PSM-93(V) MAINTENANCE folder.

6.1.2 For help while running the 2KILO program press F2. For more detailed instructions please refer to Chapter 9 of OPNAVINST 4790.4 Ship's Maintenance, Material, Management Manual. Alternate methods of Maintenance Data Collection can be incorporated into this feature of the AN/PSM-93.

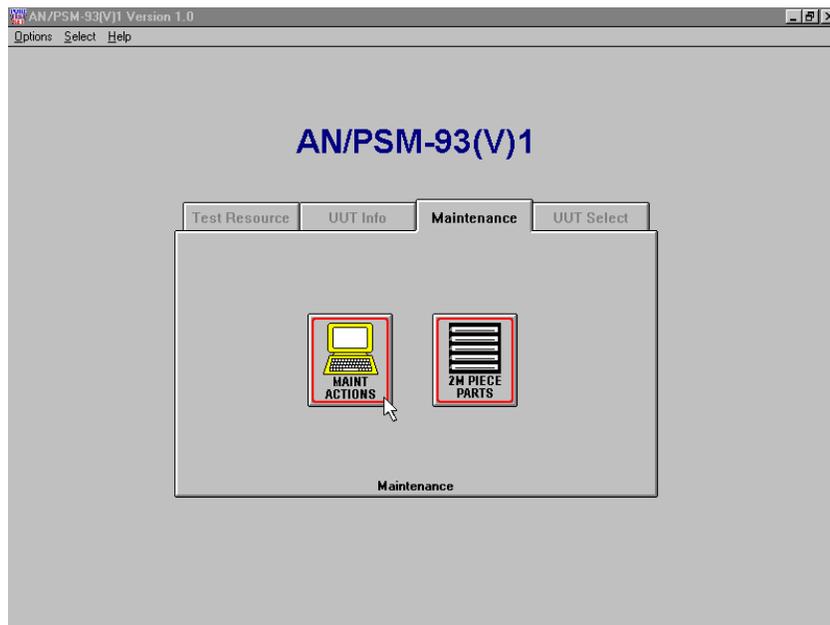


Figure 15. Maintenance Action Screen

6.1.3 To return to the AN/PSM-93(V) MAINTENANCE folder, point and click on QUIT in the 2KILO menu bar. Then click on YES in the ARE YOU SURE YOU WANT TO QUIT? window.

SECTION 7

TROUBLESHOOTING TIPS

7.1 Overview. Generally, problems with a computer occur due to incompatibilities within the software, the hardware, or both. Occasionally problems with a computer are due to operator error. Rarely, there are times when computer hardware fails catastrophically causing loss of data on the hard drive. Listed below are some general steps which can be taken to bring the computer back up. If these steps don't produce a satisfactory result, the computer may have to be turned in for repair.

7.2 Re-Boot. Sometimes a computer will get some code or a combination of codes that will lockup the CPU. Other times a printout will get lost in the I/O (Input/Output) stage. Initiating a reboot by pressing the CTRL + ALT + DEL keys, or turning off power for a few seconds will resolve most problems.

NOTE: Do not re-boot without some thought to data loss. If one of the re-boot procedures is used, all data in the current memory (RAM) will be lost.

7.3 Input/Output Problems. These problems generally occur whenever a printout is requested or during keyboard operations.

7.3.1 If the user requests a printout through a program, an error message may appear or the computer may lock-up. If a printout is called while in the DOS environment, a message will say XXXX.XXX IS CURRENTLY BEING PRINTED. Accidentally pressing the PRINT SCRN key may lock up the computer also.

7.3.2 The keyboard may cause a computer lockup. Pressing the wrong series of keys, or key combination may lockup the computer. The user might want to ensure the keyboard is properly plugged into the computer.

7.4 Boot Failure. This type of failure usually occurs whenever the computer is re-booted or turned on. The failure may be due to a hard drive problem, CPU/Memory failure, keyboard not plugged in properly, or some form of shock affecting one or the other.

7.4.1 ***This should be done only in extreme cases! No re-format or re-installation should be attempted before contacting the Technical Support contact specified in paragraph 1.11.1 of this document.*** For a suspected hard disk problem, insert the MS-DOS floppy #1 (or the appropriate Windows 95 startup or boot disk) into the applicable drive and reset the computer, first turning the power off, waiting a few seconds and turning the power on. If the computer boots and the user gets a DOS prompt on the monitor, the hard drive may have failed. At this point in time, try to get to drive C: by typing **C:** and the ENTER key. If you get the prompt C:\>, type **dir** and press ENTER key. If a directory listing is displayed on the screen, you might have access to the hard drive. The user now needs to get a backup of key files. Once the backup is obtained, the user is now ready to try to re-format and re-install the entire AN/PSM-93(V) system.

7.4.2 If a CPU/Memory failure occurs it is usually due to shock, over-heating, voltage failures and spikes, or corrosion on the circuit board connectors. They may appear as Parity Errors or a panic message. A qualified electronics technician, after de-energizing the unit in a static free environment, may try to re-seat all the circuit boards, connectors, and the keyboard connector.

7.4.3 All the above procedures are for Emergency Cases Only. If the user is unsure of any of these procedures or the computer does not respond, call the Technical Representative listed in section 1.11 for help.