



**vPad-mT<sup>TM</sup>**

**medTester Emulator App  
for vPad Safety Analyzers**

**App Version 2.03.X**

Operating Manual



**vPad-mT<sup>TM</sup>**  
*medTester Emulator App*  
*for vPad Safety Analyzers*  
Operating Manual

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# 1 Overview

vPad-mT™ is a software application (App) which may be installed on the vPad tablet, for use with vPad-ES2™, vPad-353™, or vPad-Rugged 2™ electrical safety analyzers, and which may be used to automate preventative maintenance (PM) inspections, performance testing and other types of service performed on medical equipment. vPad-mT is one component of a suite of Apps that enables a bidirectional interface between the vPad platform and a Computerized Maintenance Management Software (CMMS) system.

## 1.1 CMMS and Checklists

A CMMS program is a software application which is used for managing equipment inventory, service activities and technical personnel. EQ2 HEMS, Four Rivers® TMS, WebTMA, MediMizer, AIMS® and Mainspring Health are examples of enterprise-level CMMS which are specifically designed for use in management of medical and other equipment in a clinical setting.

CMMS systems enable automation of equipment inspection and maintenance tasks through computer-generated **Checklists**. A Checklist may include inspection check points and tests which are specific to a type of device, and which are performed in a specific order according to device or manufacturer requirements.

Some CMMS systems can export their Checklist procedures to a legacy biomedical testing device which is known as the "**medTester**". The vPad-mT App enables medTester Checklists and equipment information provided by the CMMS to be used with the vPad system, enabling vPad safety analyzers to emulate the behaviour and testing features of the medTester in executing a maintenance Checklist. In other cases, it is possible to use CMMS supplied information on testing procedures to create the required files for automation, even though the legacy "**medTester**" was never supported. Contact Datrend for more information.

## 1.2 vPad Automation Suite

vPad-mT is one component of a suite of Apps for CMMS-driven equipment maintenance and inspection. The Apps work together to provide a "closed loop" automation solution which starts with CMMS preventive maintenance schedules and/or work orders, proceeds through testing and inspection

performed with the vPad platform, and ends with the return of vPad test results to the CMMS; which then enables work orders to be closed. The vPad automation solution is "plug-and-play", requiring little if any changes to a CMMS currently working with a legacy medTester or possibly with other vintage test equipment.

Apps comprising the vPad automation suite are:



CMX™ is a software application for Microsoft® Windows® which is used as a bridge between some CMMS programs and Datrend products such as vPad-ES, vPad-353 and vPad-Rugged 2. CMX verifies medTester export files and equipment information generated by the CMMS, so that the CMMS files contain no data errors that could cause problems when used on the vPad platform. CMX is also used to transfer medTester export files, or "**MTEXPORT**" files, and equipment information to the Android tablet via USB flash drive, Bluetooth or DropBox.

More information on CMX may be found in ***MN-083 6100-048 CMX Operator's Manual***. Note this and other operator manuals for the vPad automation suite are provided on the Android tablet, and may be viewed with the **Datrend Docs App**



which is on the Home screen.

Note that CMX is not required for use with vPad-AIMS, or other web based CMMS programs that communicate via API calls.

**vPad-mT**



The purpose of vPad-mT is to enable the user to browse or search medTester Checklists and equipment ID's which have been provided to the Android tablet through the CMX software, normally as part of a scheduled PM program. When an ID or a Checklist is selected, vPad-mT converts the Checklist from medTester to vPad format and then passes the Checklist to the vPad-Check App for execution. From a user's point of view, the automatic transition from vPad-mT to vPad-Check is seamless so that the two Apps appear to work as a single program.

**vPad-Check**



With vPad-Check™, the user will perform the medTester Checklist which has been prepared by vPad-mT.

As is done with a medTester, the user will step through the maintenance procedure on the vPad one step at a time, pausing to read instructions, inspect items, and enter data as required by the procedure. Electrical safety tests and device-specific performance tests may also be executed during the procedure. At the end of the Checklist, a Test Record is saved and an inspection label may be optionally printed, which is then applied to the equipment under service. Execution then returns automatically to the main menu of vPad-mT, enabling the user to select another equipment ID or Checklist.

More information on this App may be found in ***MN-084 6100-049 vPad-Check Operator's Manual*** on the tablet.

Note that vPad-Check is not in control of the contents of the Checklist when running from vPad-mT. The Checklists are provided by the CMMS vendor, and the Autosequences are a component of vPad-mT.

**vPad-AS**



One or more steps of a medTester Checklist may require electrical safety testing, and if so, such testing is handled by the vPad-AS™ App which is called automatically when needed by vPad-Check.

For compatibility with CMMS and medTesters currently in use, vPad-AS has pre-defined AutoSequence setups that match the factory-default safety tests "A1" through "A17" of the legacy medTester. If necessary, the settings of a vPad safety test can be temporarily modified at Checklist runtime. Alternatively, any required changes to the factory default tests "A1" to "A17" can be made with the test editor of the vPad-AS App and then saved by that App for later use. More information on this App may be found in ***MN-079 6100-045 vPad-AS Operator's Manual*** on the tablet.

**vPad-NFPA**



Similar to vPad-AS, the vPad-NFPA™ App provides electrical safety testing automation, following the NFPA99-2012 requirements instead of the AAMI or IEC60601 Standards.

For compatibility with CMMS and medTesters currently in use, vPad-NFPA has pre-defined AutoSequence setups that match the factory-default safety tests "A1" through "A17" of the legacy medTester. If necessary, the settings of a vPad safety test can be temporarily modified at Checklist runtime. Alternatively, any required changes to the factory default tests "A1" to "A17" can be made with the test editor of the vPad-NFPA App and then saved by that App for later use. More information on this App may be found in ***MN-100a 6100-084 vPad-NFPA Operators Manual*** on the tablet.

**vPad-XPORT**



vPad-XPORT™ converts vPad Test Record files to medTester Upload Format (MUP or XML), an encoded format which is compatible with CMMS that currently interface with the medTester. vPad-XPORT can be used to transfer the converted files from the tablet to the CMMS computer, either by USB flash drive, Bluetooth transfer, or via DropBox. MUP or XML files transferred from vPad may be imported by the CMMS and, depending on CMMS capabilities, work orders and inventory status may be updated accordingly.

More information on this App may be found in ***MN-086 6100-053 vPad-XPORT Operator's Manual*** on the tablet.

**vPad-AIMS**



**vPad-Medimizer**




**vPad-TMA**



vPad CMMS apps communicate directly with the CMMS database to get the necessary files to create the PM schedules and to update workorders and equipment information. Communication is accomplished via an Internet connection to the CMMS database.

Additional CMMS systems that support Internet based Restful web services may be added in the future.

## 2 Installation

The vPad-mT App is normally pre-installed on the vPad tablet, but the icon for the App may not have been placed on the Home screen  .

Go to the Apps screen by pressing the Apps icon  in the upper right corner of the Home screen. Find the vPad-mT icon and press and hold the icon for a few seconds. You will then be able drag and drop the icon onto the Home screen.

In order to use the App it will need to be activated. When the App is started for the first time, the activation screen will be presented. Enter the activation code provided by your dealer to allow the App to run.

In the event that vPad-mT is not on the tablet, contact your dealer and an installation package for the app will be provided via download.


In order to use vPad-mT, vPad-Check and a safety autosequence app (vPad-AS/A6/EQT or NFPA) must also be installed and activated. For communication with the CMMS system vPad-XPORT and CMX (PC program), or, a CMMS specific Internet direct based app must be installed.



## 3 Operation

This chapter covers operation of the vPad-mT App and Checklist execution.

### 3.1 Startup

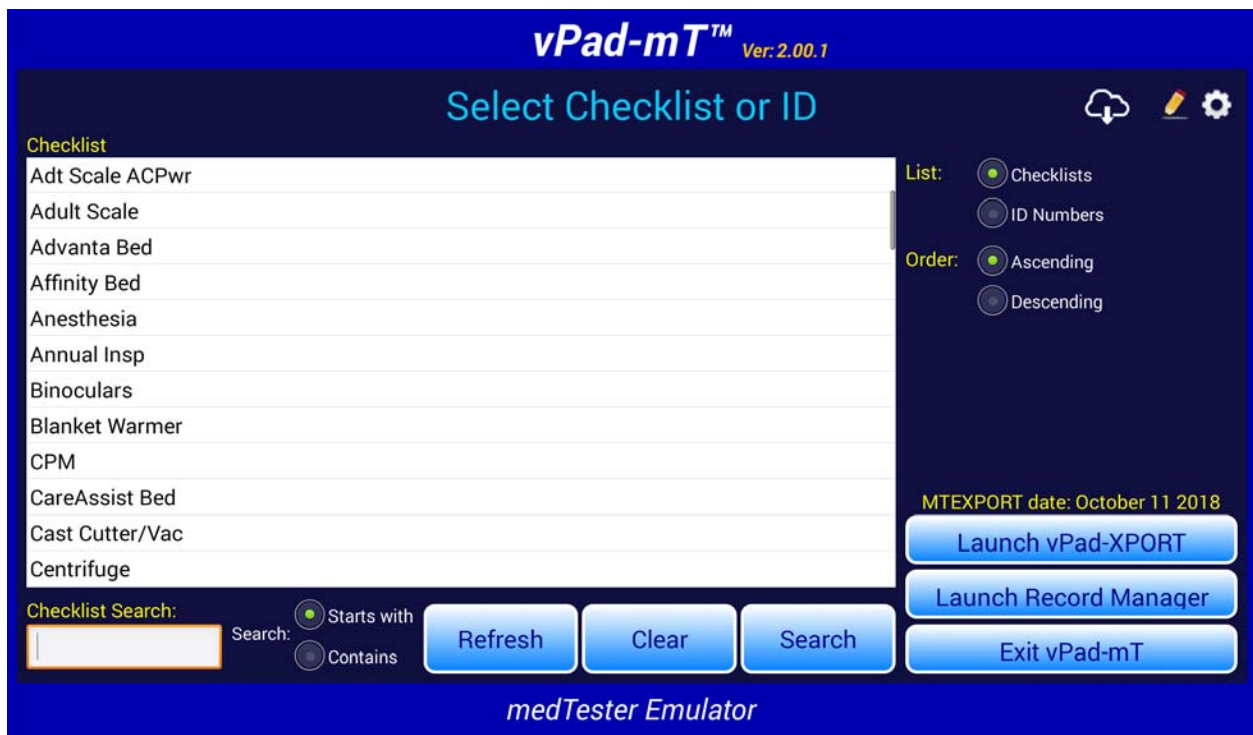
Press the vPad-mT icon  to start the App. A splash screen will be shown for a few seconds, displaying the product name and software version.



*Figure 1 - vPad-mT startup screen.*

## 3.2 Main Menu

Following start-up, vPad-mT will display the main menu of the App:

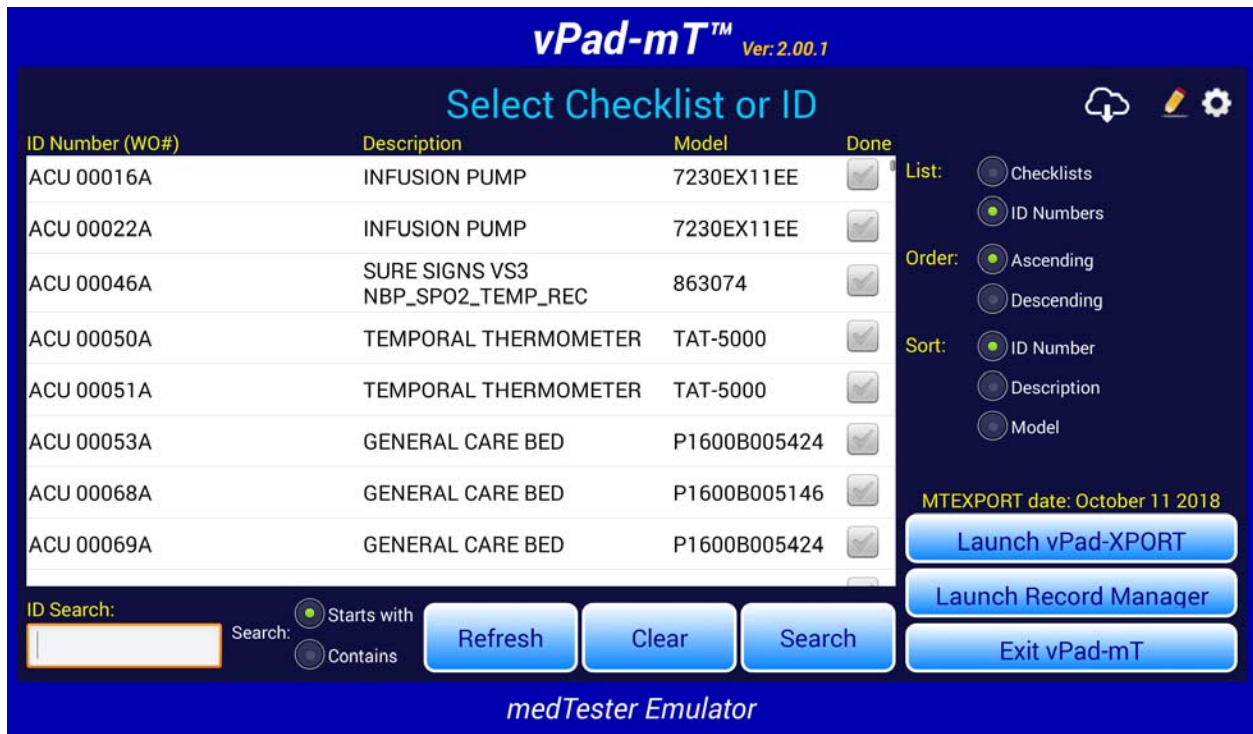


**Figure 2** - Main menu of vPad-mT, showing Checklist procedures.

Some Checklists and ID Numbers (device ID numbers of devices with scheduled PMs) are supplied as examples with the App and will appear in the scrollable list (ListView) on the left side of the screen, as shown above. Example Checklists include PM procedures for typical medical devices as well as some selected models of specific devices. The listing may be sorted in ascending or descending order by selecting the corresponding radio button at upper right on the screen.

A list of **equipment** may be viewed after selecting the "**List: ID Numbers**" radio button. This menu (**Figure 3**) lists equipment by ID or control number, along with the Checklist procedure names and model numbers corresponding to each ID. The Checklist procedure name may optionally be replaced by the device Description. Display of the Model or Description requires the transfer of an equipment.csv file from the CMMS system. This list may be sorted by ID number, Checklist (or Description), or Model in ascending or descending order, depending on the **Sort** selection.







**Figure 3** - Main menu of vPad-mT, showing equipment ID's.

Example Checklists and ID Numbers respectively shown in **Figure 2** and **Figure 3** come from three example medTester export files (**MTEXPORT.ITM**, **MTEXPORT.LST** and **MTEXPORT.IDN**) which are installed with the App. There is a set of "demo" files provided initially to enable vPad-mT to function and allow you to gain some experience in working with the App. Before using the App to perform actual PM inspections and other maintenance activities at your institution, the demo files will need to be replaced with **MTEXPORT** files from your Computerized Maintenance Management System (CMMS). For further instructions on importing **MTEXPORT** files from your CMMS, refer to Section 3.2.6 following. Note the date which is shown above the "**Launch vPad-XPORT**" button corresponds to the system date of the **MTEXPORT.IDN** file, and is intended to represent the currency of data which has been provided by your CMMS.

To start a Checklist procedure, select the "**List: Checklists**" radio button, press and scroll the List View window until the desired Checklist is found, then tap on the Checklist. Alternatively, you may start a test by entering all or part of a Checklist name in the "Checklist Search" box and pressing "**Search**". The search is not case sensitive, and will find the closest match to what has been entered. For instance, entering 'be' would take you to 'Bed/Electric' in the sample list. The contents of the search window can be cleared by touching the "**Clear**" or "**Refresh**" button. For other "**Search**" options see the next section.

To start a test for a particular piece of equipment, select the **"List: ID Numbers"** radio button, then select the equipment from the list or alternatively enter all or part of an equipment ID Number into the "ID Number" search box and press **"Search"**. The search is not case sensitive, and will find the closest match to what has been entered. For other **"Search"** options see the next section.

If there is an exact match and there is only one occurrence of the ID Number in the list, the user will be taken directly to the Equipment Information screen (*Figure 17* on page 21). However, it is possible to have more than one occurrence of an ID Number, representing multiple, different checklists (eg. Annual PM, Biannual PM, Scheduled Battery Replacement), or multiple work orders. If more than one possibility exists, the ListView screen is shown, with the ID Number highlighted in green. The desired checklist\work order can then be selected by tapping the correct entry.

To return to the Android Home screen, press the  icon on the navigation bar. Note this will only pause the App temporarily and will not actually terminate or close vPad-mT. To fully close the App, press the **"Exit vPad-Check"** button or alternatively the Android **"BACK"** navigation button  when viewing the main menu.

### 3.2.1 Search for Checklist or ID

To search for a particular Checklist, first ensure **"List: Checklists"** is enabled. Then tap the **"Checklist Search"** box of the menu shown in *Figure 2*, enter the first few characters of the Checklist, then press the **"Search"** button. With the search selection set to **"Starts with"** mode, the List View will move to the nearest matching Checklist, which will then appear highlighted in green. If the full name of a Checklist is entered, and an exact match to the entered name is found, then the Checklist will begin execution automatically. The search is not case sensitive.

**"Search"** also has the ability to search in a **"Contains"** mode. In this mode, the search will create a smaller list of Checklists which contain the characters entered on the keyboard, and present them in the List View. The list can be further reduced by additional searches.

Search for equipment in a similar way. First ensure **"List: ID Number"** is enabled and **"Sort:ID Number"** is selected. Then tap the **"ID Search"** box shown in *Figure 3*, enter the first few characters of the **"ID Number"**, then press the **"Search"** button. An exact match to the entered ID will cause the Checklist associated with the equipment to be started automatically. If no exact match is found, the list is repositioned to the nearest matching ID. The search is not case sensitive.

**"Search"** also has the ability to search in a **"Contains"** mode. In this mode, the search will create a smaller list of ID Numbers which contain the characters entered on the keyboard, and present them in the List View. The list can be further reduced by additional searches.



### 3.2.2 Sorting ID Numbers

ID Numbers presented in the List View are for devices that are currently due for a Preventive Maintenance or Performance Assurance Inspection, and have a work order open in the CMMS system. The information presented in the List View provides three columns of information. The first column is the ID Number of the device. The second column can be either the Checklist name or the device Description. If Description is selected, it is important that an equipment.csv file is available in the vPad-mT folder on the tablet. The third column is either the device Model or the device Location. Although this is not an optional field, it also requires the equipment.csv file to obtain the information.

If information is available in a column, it can be sorted by selection of the Sort order on the right side of the display. The options will be: ID Number; Checklist; Model, ID Number; Description; Model or, ID Number; Description; Location depending on the selection made via the **Settings** menu - see Section 3.2.3 below.

Note that when a sort order is selected, the **Search** focus is modified accordingly, and the List View can be viewed in **Ascending** or **Descending** order for the selected sort order.

### 3.2.3 vPad-mT Settings

vPad-mT provides a number of settings that can be used to enhance the automation of certain processes. The **Settings** icon is in the upper right of the screen and can be either the **Edit Settings** icon, , or the **Run Settings** icon, . In the event **Run Directly** is checked (see below), the **Run Settings** icon will be displayed, otherwise, the **Edit Settings** icon will be displayed. Settings may actually be edited in both modes.

*Figure 4* through *Figure 7* show the settings that can be adjusted in vPad-mT.

Starting with *Figure 4*; it is possible to use vPad-mT with NFPA or AAMI/IEC Autosequences by selecting the appropriate **Safety Test** radio button. The medTester assumed it was using the electrical safety test Autosequences that were defined internally to the medTester, there was no need to consider which Standard to follow. MedTester was roughly based on the AAMI ES-93 Standard, but did not force conformity with any particular part of the Standard. vPad-mT allows conformance with the 3 Standards commonly used in North America; NFPA, AAMI ES-93 and IEC60601. Select the Standard which you have installed on your tablet: NFPA or AAMI/IEC60601. In many Checklists, an electrical safety test is built in, however it may be desired to perform the test without including the electrical safety test. In this case, the **Safety Test: Skip** setting may be selected.

**Run Test / Directly** will skip over the display of the **Equipment Info** screen and go directly to the Checklist. The equipment database will be searched for the ID number, unless the **Search Equipment/Skip Search** box is checked.

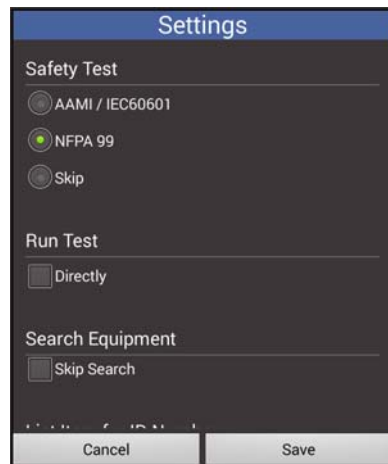


Figure 4. Settings\_1

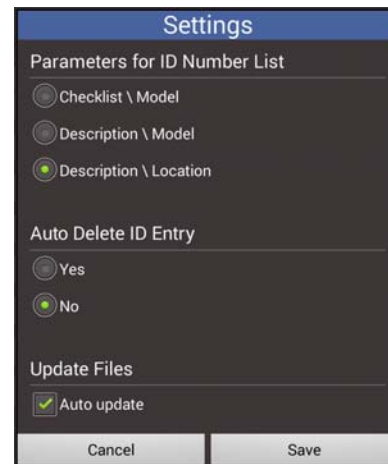


Figure 5. Settings\_2

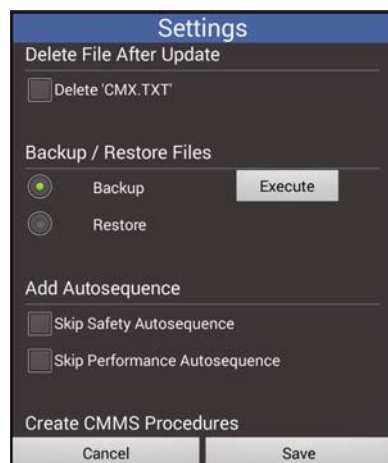


Figure 6. Settings\_3

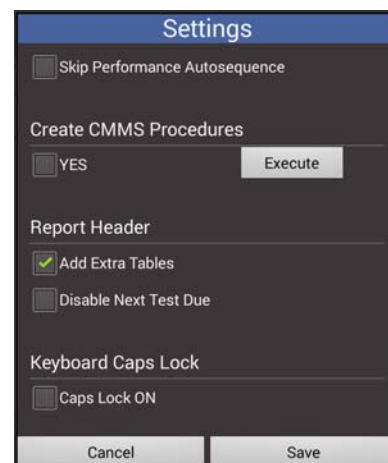


Figure 7. Settings\_4

In **Figure 5**, under **Parameters for ID Number List**, it is possible to select either the **Checklist \ Model** combination, the device **Description \ Model** combination or the device **Description \ Location** combination as the contents of the second and third columns of information when displaying the List View by **ID Number**. To show a valid **Model**, **Description** or **Location** requires that an equipment.csv file be available in the vPad-mT folder.

The **Auto Delete ID Entry** allows the user to delete/remove the **ID Number** from the List View when the test report has been completed for this device. Selecting **Yes** will result in the number of **ID Numbers** shown in the List View gradually getting smaller as tests are completed. Selecting **No** will not delete the **ID Number** from the List View, but will display a green checkmark for device tests that have been completed.

If the **Update Files / Auto Update** box is checked, vPad-mT will first search for a CMX.TXT file in the USB drive, then in the Bluetooth folder. If the CMX.TXT file is found on the USB or in the Bluetooth folder on the tablet and if **Auto Update** is checked, vPad-mT will immediately update the files for the PM schedules from the CMX.TXT file. CMX files are not relevant for web based interfaces such as vPad-Medimizer or vPad-TMA.


In *Figure 6*, if the **Delete File After Update / Delete CMX.TXT** box is checked then CMX.TXT will be deleted following the update of the PM Schedule and/or equipment database. This option is available for users who are not sure if they want to keep or delete the CMX.TXT file. If it is not deleted and **Auto Update** is checked, the 'update' will be performed each time vPad-mT is loaded. (not relevant for web based interfaces )

vPad-mT's file-update feature is intended to facilitate the import of these files:

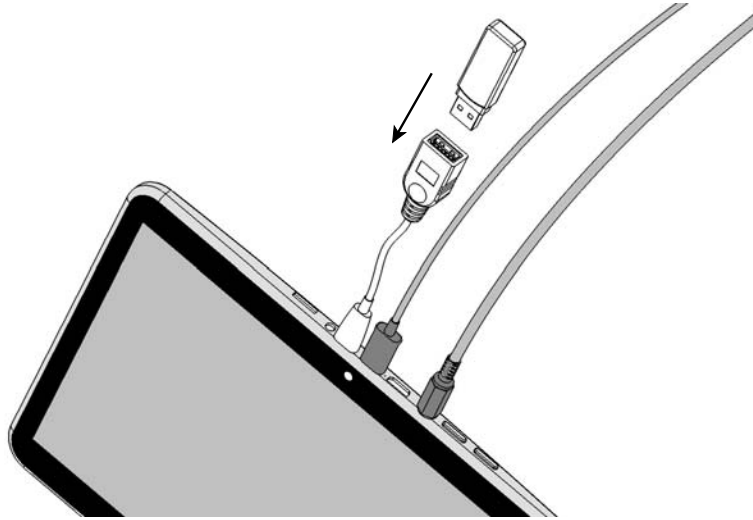
**MTEXTPORT.ITM**  
**MTEXTPORT.LST**  
**MTEXTPORT.IDN**  
**EQUIPMENT.CSV**

from the CMMS to vPad-mT following the typical, legacy process used with medTester devices.

At the PC, the **MTEXTPORT** and **EQUIPMENT.CSV** files are obtained from the Computerized Maintenance Management System (CMMS) using the Datrend CMX software. After checking the CMMS files for errors, the CMX software creates a file called CMX.TXT which can be copied to a USB flash drive, or alternatively, the CMX software can transmit the file to the Android tablet via Bluetooth. For further instructions, refer to ***MN-083 6100-048 CMX Operator's Manual*** provided on the Android

tablet. Note this and other Datrend manuals may be viewed with the **Datrend Docs App**  which is on the Home screen.

If the CMX software has copied the CMMS files to a USB flash drive, disconnect the flash drive from the PC then reconnect the drive to the microUSB "HOST" port of the tablet. Depending on the tablet model, an adaptor cable provided with the tablet may be required for the flash drive connection (see ***Figure 8***).



*Figure 8 - Connection of USB flash drive to tablet.*

If the CMX software has sent the files by Bluetooth, simply start vPad-mT. vPad-mT will search the Bluetooth transfer directory of the tablet during startup if the **Auto Update** flag is checked, and if the CMX.TXT file is found, vPad-mT will then import it. Alternately, the update file may be on a USB drive. Do not connect a USB flash drive to the tablet while updating CMMS files via Bluetooth as the App will default to searching the USB drive for the file first.

It is important to remove any existing CMX.TXT file from the tablet Bluetooth folder *before* using CMX to create and send a new CMX.TXT file. Failure to do so will result in the new CMX file being renamed to CMX(-x).TXT (where x can be any number sequentially from 1 up). If the 'first' CMX file is not removed, it will be the file that is automatically loaded each time.

Once the CMMS files are successfully imported, the "MTEXPORT" date shown above the "**Launch vPad-APP**" button will be modified accordingly. Note this is the system date of **MTEXPORT.IDN** and is intended to represent the currency of the data which has been provided by the CMMS. The **vPad-APP** in "**Launch vPad-APP**" may be the more generic **vPad-XPORT**, or a CMMS specific app like **vPad-Medimizer** or **vPad-HEMS**.

It is also possible to Backup the existing PM Schedule and/or equipment database before it is replaced with a new CMX.TXT file. This can provide peace of mind, in case there is a problem with an update. The backed up data can be Restored to the last saved, working version of the files. Simply select **Backup** or **Restore** and run the process by touching the Execute button.

In *Figure 7* on page 12, the **Add Autosequences / Skip Safety (or Performance) Autosequences** setting is specific to the MediMizer CMMS. If this option is checked, running one of the 'ADDxxxx' pseudo Control #'s will allow addition of a safety test to the main Checklist (AEQ ADDxxxx) and one or more additional performance type Checklists. Contact Datrend for further details.

Checklists which are imported from a CMMS program follow the legacy medTester format using the **MTEXPORT** files (see discussion of the CMX.TXT files above). Datrend has a different method of defining test Procedures, using a script based system (VPL) that includes many improvements to medTester's basic Checks. The **Create CMMS Procedures** option will convert the legacy medTester Checklists into Datrend VPL files, allowing editing and improving the original Checklists for use with other Datrend Apps. Contact Datrend for further details.


### 3.2.4 Report Header and Tables


The option: **Report Header\Add Extra Tables** is specific to WebTMA, and adds support for the use of tables of data for validated data entry and possible inclusion in the test report. The tables are loaded into the tablet using **Settings\Get Tables** in the vPad-TMA app. When Work Orders and Equipment files are downloaded using vPad-TMA, the appropriate values for the table entries will be included in the downloads. However, if it is desired to make any changes to the existing information, the new data must (in most cases) come from tables of validated data provided for the specific ClientID from the WebTMA server.

In addition to modifying existing device data, it is possible to create new devices in vPad-TMA. When creating a new device, there are some mandatory fields of data that must be supplied, and some optional fields that are recommended. Once again, most of this data must come from validated tables supplied via WebTMA via the vPad-TMA app.

The changes resulting from **Add Extra Tables** for WebTMA are evident in the Equipment Information screen and will be detailed in Appendix A.

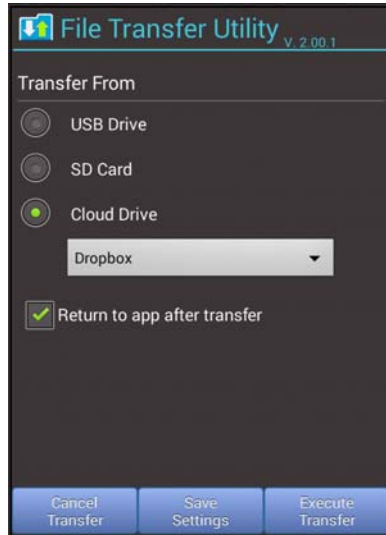
### 3.2.5 Cloud Storage\CMX download

If a cloud storage service has been installed, , the CMX.TXT file can be placed there from the PC and retrieved by the tablet. Datrend currently supports **Dropbox**, **Google Drive** and **OneDrive**. Installing a cloud storage service on the PC and tablet, and synchronizing the installations are the responsibility of the user.

If a cloud storage service has been installed on the tablet, touching the  icon will cause the File Transfer app to appear. Selecting **Dropbox** from the Cloud list and touching the Execute button will start the process of downloading the CMX.TXT file from the **Dropbox / vPad Import** folder and placing it in the Bluetooth folder.



The following, typical screens will appear on the tablet during the download process:



*Figure 9. FT Cloud Drives*

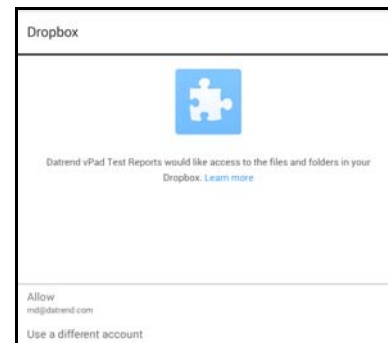


*Figure 10. FT Cloud Drives 2*

Select the **Cloud Drive / Dropbox** option, then touch **Execute**.



*Figure 11. Dropbox Login*

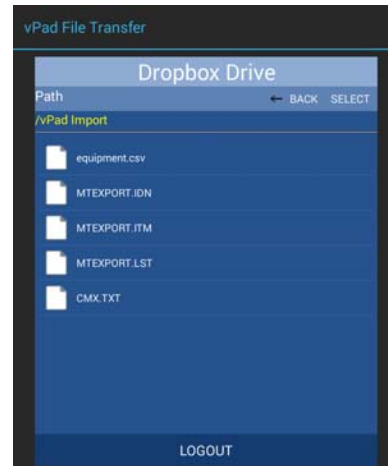


*Figure 12. Dropbox Allow*





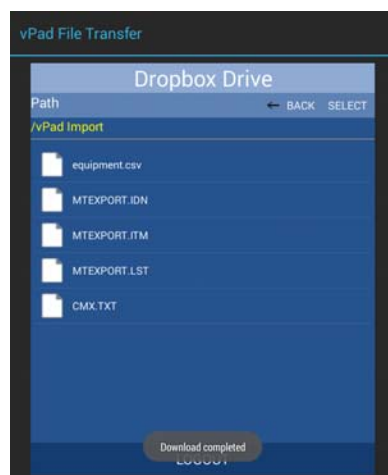
**Figure 13.** *Dropbox Home Dir*



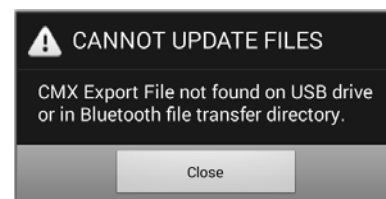
**Figure 14.** *Dropbox CMX.TXT*

When first logged into Dropbox, the home directory will be shown. Touch on the folder where the CMX.TXT file will be found, vPad Import in this case. When the CMX.TXT filename is visible in the folder contents, touch **SELECT** on the upper menu bar. CMX.TXT will be downloaded to the **Bluetooth** folder on the tablet. When the download is complete, the **Download Complete** toast message will appear for several seconds, as shown in **Figure 15**.

Once the CMX.TXT file has been downloaded to the tablet, **LOGOUT** of the **File Transfer** app. If **Auto Update** is turned on, the contents of the CMX.TXT file will be loaded into vPad-mT. If the CMX.TXT file can not be found in the Bluetooth folder, an Update Fail message will appear, as shown in **Figure 16**.



**Figure 15.** *Dropbox Download*



**Figure 16.** *Update failure*

Google Drive and OneDrive will work in a similar manner.

Downloading the CMX.TXT file from a USB Memory stick or external SD Card follows the same process, just be sure the original CMX.TXT file is in the root directory of the memory device.

### 3.2.6 Launch vPad-XPORT

When Checklists are completed, one or more test report will have been created, which need to be sent to the PC for the CMMS program to process. To convert the native text files into CMMS compatible MUP or XML files, touch the "**Launch vPad-XPORT**" button. This will open the vPad-XPORT app, with any new files automatically tagged for transfer according to the current setting in vPad-XPORT (MUP, XML or CSV). **File Transfer** will automatically be opened with the last transfer settings enabled. Press **Execute** to confirm the file transfer with the existing settings.

In the event vPad-mT is launched from another CMMS specific App such as vPad-MediMizer, vPad-TMA, vPad-AIMS or vPad-HEMS, this button may change to **Launch vPad-MediMizer**, **Launch vPad-TMA**, **Launch vPad-AIMS** or **Launch vPad-HEMS** respectively (or other Apps as they develop).

Note that **File Transfer** settings are controlled from within **File Transfer**, and are not specific to the App calling it. Changes made to the settings will be reflected in **File Transfer** when used in other Apps such as **Record Manager**.

### 3.2.7 PM Inspection Labels

Adhesive labels may be applied to the devices of an inventory to identify equipment with unique control numbers, and to indicate past and pending dates for PM inspection of equipment. vPad-mT is not itself responsible for printing of PM inspection labels, but instead relies on several other apps of the vPad automation suite to provide this capability. Apps which enable\provide label printing are as follows:

#### ***vPad Settings***



The vPad Settings™ app globally enables PM label printing for the vPad automation suite. With this app, you can select, configure and test the label printer to be used. Refer to ***MN-129 vPad Settings Operator's Manual*** for information on the supported printer models and printer setup instructions.

#### ***vPad-Check***



If label printing is enabled in vPad-Settings, vPad-Check will prompt you to print a label once a Test Record has been saved at the end of a test. PM labels typically include the ID or control number of the equipment, pass/fail status, the test date, the date at which the next inspection or PM becomes due, and a technician ID. Refer to ***MN-084 vPad-Check Operator's Manual*** for more information on printing PM labels during a test.

#### ***vPad-PM Tag***



After being applied to a device, a PM label may become accidentally detached or damaged. In this case, it becomes necessary to produce a replacement label. The vPad-PM Tag™ app may be used to print such labels, based on recall of information previously saved by vPad-Check in a Test Record file. Similarly, vPad-PM Tag may also be used to produce PM labels for devices that have been previously tested with an app *other than* vPad-Check, for example, a vPad app which performs electrical safety testing or performance testing. More information on the setup and use of vPad-PM Tag may be found in ***MN-115 vPad-PM Tag Operator's Manual***.

### 3.3 Running a Checklist

A test is started by selecting the required Checklist (*Figure 2*, page 8), or alternatively an equipment ID (*Figure 3*, page 9). In the latter case, a Checklist which has been assigned by your CMMS to the equipment will be executed.

vPad-mT begins by translating the medTester Checklist provided by your CMMS to vPad format. You are then prompted to enter information about the equipment under service. If a test is initiated by equipment ID, and if an equipment data file (**EQUIPMENT.CSV**) has been provided by your CMMS, then some or all of the equipment information may be populated automatically by vPad-mT.

After inputting or confirming the equipment information, you will then step through this Checklist procedure one step at a time, pausing to read instructions, inspect items, and enter data as required by the procedure. Electrical safety tests and device-specific performance tests may also be executed during the procedure. At the end of the Checklist, a Test Record is saved and an inspection label may be optionally printed. On completion of the Checklist, you are returned to the main menu from which you started.

This section provides a summary of Checklist execution, beginning with the menu for entry of the equipment information. For additional information on Checklists, refer to ***MN-084 6100-049 vPad-Check Operator's Manual***.

### 3.3.1 Equipment Information

When a PM inspection or maintenance procedure is started, the first screen shown will be for entering information about the equipment. When starting from the Checklist menu (*Figure 2*, page 8), the equipment information fields will not be populated, although a facility and a technician ID will be shown if this information has been previously input to vPad-mT.

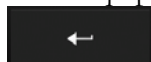


The screenshot shows the 'Equipment Information' screen with a dark background and light text. At the top, the title 'Equipment Information' is in large blue letters, and below it, 'Checklist: AERATOR PM' is in yellow. The form contains several input fields: 'ID Number:', 'Serial Number:', 'Manufacturer:', 'Facility:', 'Technician ID:', 'Work Order:', 'Work Order Type:', 'Description:', 'Model:', 'Location:', and 'Next Test Due:'. The 'Technician ID' field is pre-filled with '00009'. There are 'Choose' buttons next to the 'Work Order Type' and 'Technician ID' fields. At the bottom, there are four blue buttons: 'Cancel', 'Erase All', 'Search', and 'Run Test'. A small icon of a person with a plus sign is next to the 'Next Test Due' field.

*Figure 17 - Equipment Information menu.*

Tap on a text field to display the Android keyboard and enter information. If an external keyboard is connected to the tablet, the Android keyboard is not displayed and data entry is then accepted from the external input device. A barcode scanner can also be used for data entry.

If the equipment ID or control number is known, enter it into the **ID Number** field and press **Next\Enter**

 on the keyboard (*Figure 18*).

*Figure 18 - Entering an equipment ID.*

Entering an ID causes vPad-mT to check for an equipment data file (**EQUIPMENT.CSV**). If this data file is present, the file is searched for the ID. If the ID is found, the equipment information fields are populated from the file and the keyboard is dismissed automatically. In the event that the equipment data is found, confirm the displayed information is correct then press **Run Test** to begin the Checklist.

*Figure 19 - Successful equipment search after ID entry.*

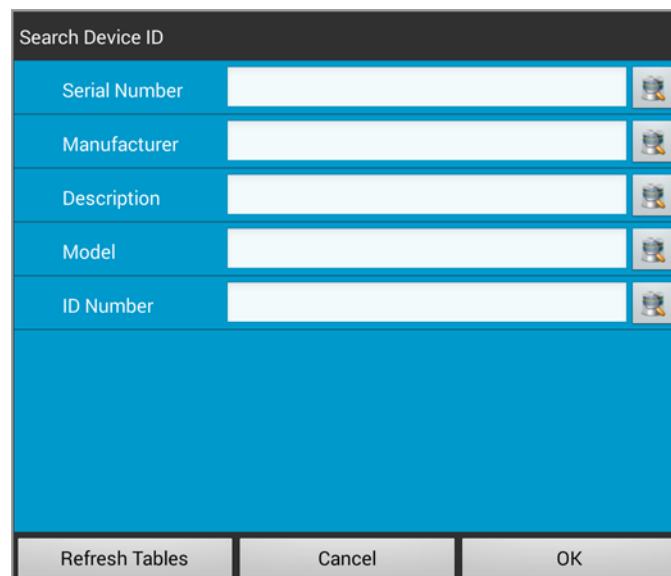
In the event an ID is not found, an error message is displayed. You may modify the ID and press **Search** to try again.

If you want to test a device for which the ID Number is not known for some reason (eg. the asset tag has been removed or destroyed), but you know some details of the Equipment Information (like the Serial Number), you can run a test by Checklist and Search for the device using other key parameters. For instance, if you have a Medtronic Lifepak 12 defibrillator but you do not know the ID Number, select the appropriate Checklist (eg. DEFIB LIFEPAK 12 PM) and a blank Equipment Information screen will be displayed.

The image shows a screenshot of the 'Equipment Information' form. At the top, the title 'Equipment Information' is in blue. Below it, 'Checklist: AERATOR PM' is displayed in yellow. The form contains several input fields: 'ID Number:', 'Serial Number:', 'Manufacturer:', 'Facility:', 'Technician ID:' (with a 'Choose' button), 'Work Order:', 'Work Order Type:' (with a 'Choose' button), 'Description:', 'Model:', 'Location:', and 'Next Test Due:'. At the bottom, there are four buttons: 'Cancel', 'Erase All', 'Search', and 'Run Test'. A small icon of a defibrillator is visible next to the 'Next Test Due:' field.

**Figure 20** - Test by Checklist, no Equipment Information

With a blank ID Number field, touch the Search button to initiate the Search by Equipment Information function.

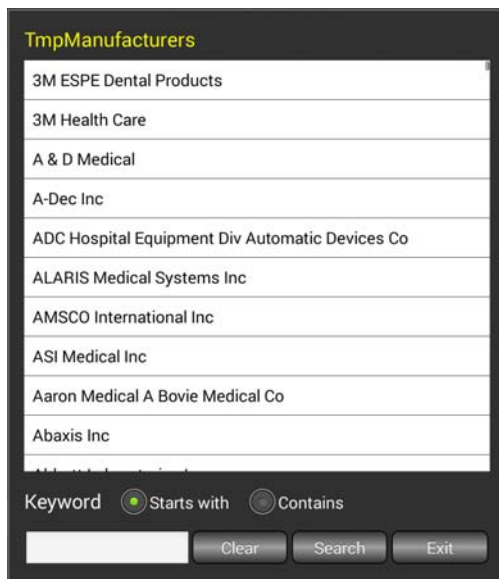
The image shows a screenshot of the 'Search Device ID' form. It has a title bar 'Search Device ID'. Below it, there are five rows, each with a label (Serial Number, Manufacturer, Description, Model, ID Number) and an input field. To the right of each input field is a small icon of a defibrillator. At the bottom, there are three buttons: 'Refresh Tables', 'Cancel', and 'OK'.

**Figure 21** - Search by Equipment Information.

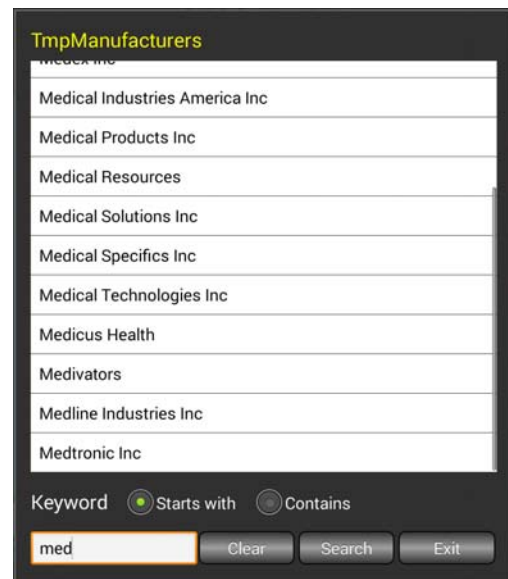
Using this feature a device can be found using any or all of the top four device parameters; Serial Number, Manufacturer, Description or Model. As selections are made from the available list, the remaining parameters' lists are reduced to reflect the first selection. For instance, if we start with a manufacturer, the full list of manufacturers is presented when the Manufacturer table icon is touched.



*Figure 22 - Search by Manufacturer.*



*Figure 23 - Full Manufacturer List.*



*Figure 24 - Search with filtered list of Manufacturers.*

The specific manufacturer name can be searched, and when the required one is shown on the display, touch the name to select it. To search, enter the search text in the field at the bottom left, choose **Starts with** or **Contains**, and touch the **Search** button. The list of Manufacturers that meets the search criteria will be displayed as in *Figure 24*, above.

Touch on the specific manufacturer and you will be returned to the Search screen with the selected manufacturer entered in the text field.



*Figure 25 - Manufacturer Selected.*

*Figure 26 - Manufacturer Selected.*

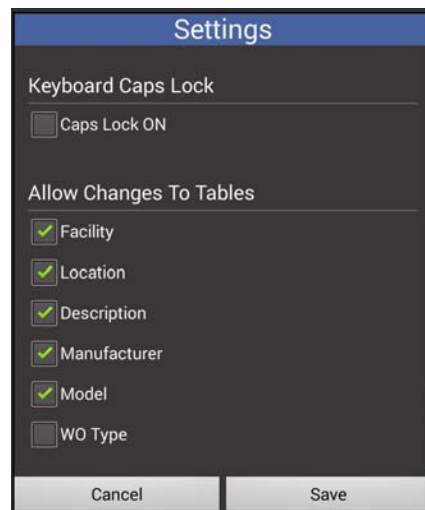
If you select another field (eg. Descriptions) to search on, the list of Descriptions(DeviceTypes) displayed will be for devices with a Manufacturer = Medtronic Emergency Response Systems.

As the lists are trimmed down to match the criteria, you will eventually have either a very short list of ID Numbers or Serial Numbers from which to choose. At that point, select the one device that is appropriate and then touch **Okay** to return to the **Equipment Information** screen with the relevant data for the device.



If you do not find what you want or simply want to create a new filter, touch the **Refresh Tables** button to begin again.

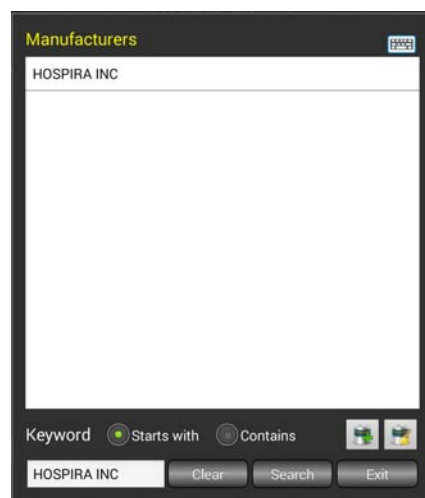
Typically, tables of information imported from a CMMS system should not be modified, but under certain circumstances it may be acceptable to add new entries. This is CMMS dependent. Confirm that changes can be recognized by the CMMS system before changes are made. If your CMMS system validates field contents in the test record, making changes may result in failure to accept test reports.

In the Settings, to enable the ability to change a table on the tablet, check the box beside the table to which you wish to be able to add entries.



*Figure 27 - Allow Table Changes.*

With the above tables checked, you can then select, for instance, the Manufacturer's table. You will be presented with the Search dialog which includes a  icon. Type a new name in the text box next to the **Clear** button and press  to add it to the list.



*Figure 28 - Add to Tables.*

**Equipment Information**  
Checklist: DEFIB LIFEPAK 12

ID Number: 82196 Work Order: Work Order Type: Choose

Serial Number: Description: Defibrillator, Life Pak 12

Manufacturer: Medtronic Emergency Response System Model:

Facility: Location:

Technician ID: 00009 Choose Next Test Due:

Cancel Erase All Search Run Test

*Figure 29 - Device Selected from Search*

**Equipment Information**  
Checklist: DEFIB LIFEPAK 12

ID Number: 82196 Work Order: Work Order Type: Choose

Serial Number: 32777174 Description: Defibrillator, Life Pak 12

Manufacturer: Medtronic Emergency Response System Model: LIFEPAK12

Facility: Bernardo Medical Center Location: Main

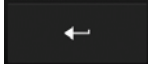


Technician ID: 00009 Choose Next Test Due: 01/11/2017

Cancel Erase All Search Run Test

*Figure 30 - Device Info Updated.*

On returning from the **Search** function, up to 4 of the open fields will be entered. If you wish to update as much information as possible, re-**Search** if the **ID Number** field is not blank.

When starting a procedure by Checklist, it is not mandatory for you to enter an equipment ID before pressing the **Run Test** button. However, you cannot save a Test Record until an ID has been input. If you complete a Checklist but have not yet entered an ID, you will be prompted to enter one at the end of the test, so that a Record can then be created. **Note** that the Search by Equipment Information function is **only** available **before** the test is started, not after it is finished.

When entering equipment information manually, pressing ENTER  will advance data input to the next text field on the screen. Alternatively, use  to navigate the text fields, or simply tap a field to jump immediately there. When done entering the information, press  to dismiss the keyboard and expose the **Run Test**, **Search Equipment** and **Cancel** buttons at the bottom of the menu.


You may also start a PM inspection or maintenance procedure by selecting an equipment ID from the list of **Figure 3** (page 9). If the **EQUIPMENT.CSV** file is present, vPad-mT will search the file for the ID. If the ID is found and there is only one instance, the information fields on the menu of **Figure 17** will be populated automatically. If there is more than one entry of an ID, the ListView will remain, with the ID highlighted. The desired ID/Checklist combination can then be selected from the list. Confirm the displayed equipment information is correct then press **Run Test** to begin the Checklist. Changes made to the equipment information is recorded in the test record, but the changes **will not** be saved to the equipment database. In the event the ID is not found, or if the **EQUIPMENT.CSV** file is not available, then input the information manually as described above.

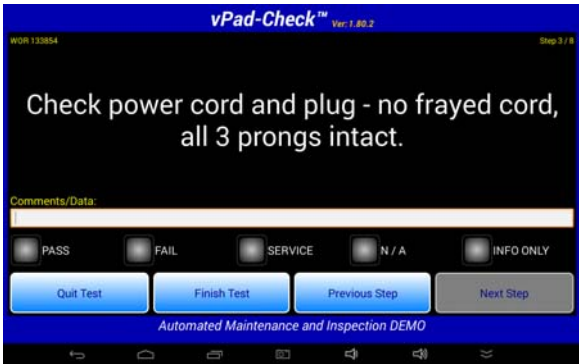
### 3.3.2 Checklist Steps

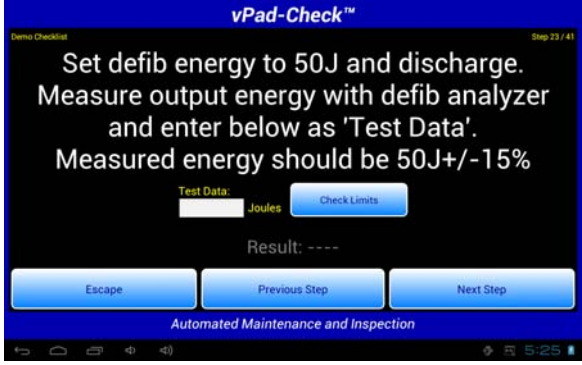

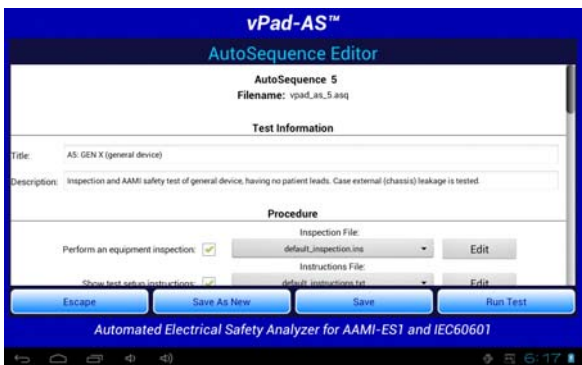
After the equipment information is input, the vPad-Check App is launched by vPad-mT to execute the Checklist. The table below summarizes the steps that may be encountered when running a Checklist. For more details on Checklist execution, refer to Chapter 3 of *MN-084 6100-049 vPad-Check Operator's Manual*.


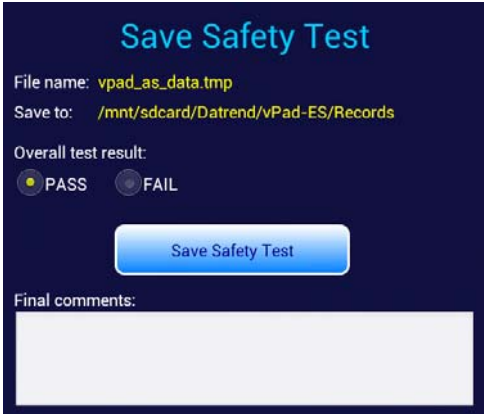
Note that a CMMS system which has medTester compatible Checklists will likely only have prompt, Pass\Fail and Autosequence type tests. Some may contain RS232 command tests. Other vPad-Check test statement types can be utilized by a CMMS system by reference to a Datrend Checklist with the medTester Autosequence CheckItem.

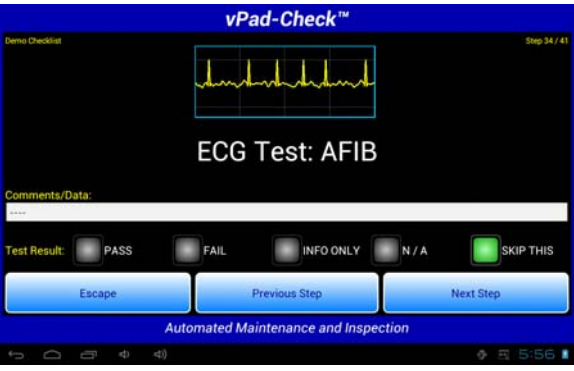
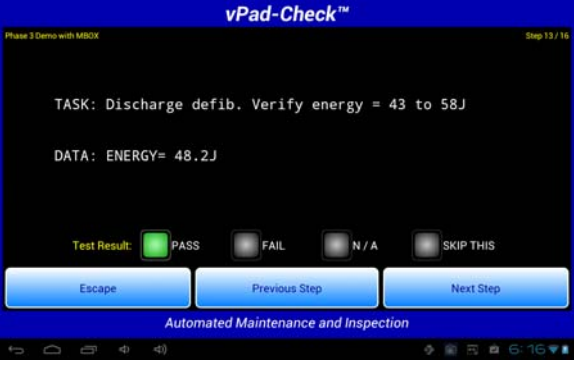
For more details on how Datrend Checklist statements can be used to realize significant enhancements to Checklists, refer to Chapter 4 of *MN-084 6100-049 vPad-Check Operator's Manual*.

Checklist Step	Example Display	Operation
<i>Prompt screen</i>		<p>Most Checklists include User Prompt screens that provide the user with instructions and/or information on what to do, or may simply be a Header for a test section. Press <b>"Next Step"</b> when ready to continue with the procedure. <b>"Previous Step"</b> may be pressed to step backward through the Checklist. This allows you to review previously-recorded results and make changes if necessary.</p>

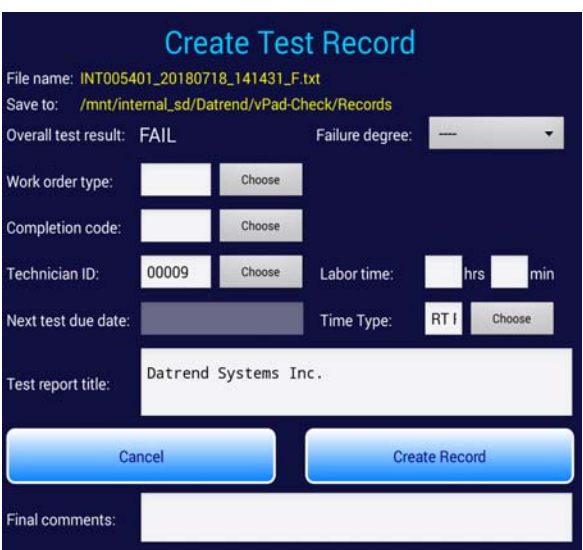

Checklist Step	Example Display	Operation
<p><i>Pass-fail with User Data Input</i></p>		<p>Checklists often include inspection steps that allow you to enter information. Perform the inspection as instructed. To input comments or measurement data, tap the <b>"Comments/Data"</b> box to display the Android keypad. If the unit passes the requirements touch the PASS button to complete the step and move directly to the Next Step. If the unit fails the requirements of the test, touch the FAIL button. Note that it may be necessary to enter the reason the device failed in the Comments/Data box before you can proceed to the Next Step. A minimum of characters may be required (1 - 5, settings dependent) to describe the failure.</p> <p>Set the test result to <b>"INFO ONLY"</b> if the entered data is informational and does not relate to equipment acceptability or performance. Set the test result to "N/A" if, for some reason this test step is not applicable to this particular device. You may also "Skip" this test step if, for some reason this test step is not required for this particular device. None of these options will fail the test step, however, each of them may require a reason (see minimum characters above) for not selecting PASS or FAIL.</p>



Checklist Step	Example Display	Operation
<b>Limit Test</b>		<p>If a Checklist includes an AutoSequence for a specific medical device such as a defibrillator, pacemaker or ESU, you may see one or more Limit Tests. Perform the test or measurement as instructed, then tap <b>"Test Data"</b> to display the Android keypad. Enter the measurement result and press <b>"Check Limits"</b>. The entered value is tested against limits specified in the Checklist, and the result will be displayed as "PASS" or "FAIL".</p>
<b>Cal Equipment</b>		<p>A Checklist may be able to call vPad-Cal™ (optional app, must be installed on tablet), to include a list of test instrumentation used in the checklist, along with the last calibration date of the test instruments.</p>
<b>Electrical Safety Test</b>		<p>If a Checklist includes an electrical safety test, the test will be performed by the vPad-&lt;safety test&gt; App, which is launched by vPad-Check. If the <b>"AutoSequence Editor"</b> menu is displayed, review the settings of the safety test and make changes if necessary, then press <b>"Run Test"</b>. Note that the <b>Editor</b> will be skipped over if the <b>Enable Edit</b> setting has <i>not</i> been checked in the vPad-&lt;safety Test&gt; App.</p> <p>The default &lt;safety test&gt; may be set to AS, A6, or NFPA. See the manual for details.</p>

Checklist Step	Example Display	Operation
		<p>Typically, a safety test will begin by displaying some setup instructions. Following the instructions, the safety test will proceed automatically through a number of measurements. Each measurement is compared to a limit which is defined in the Safety AutoSequence setup. The sequence may stop at certain steps and you may be required to respond to prompts or alarms displayed by vPad-AS. Refer to <b>MN-079 (6100-045) vPad-AS Operators Manual</b> for further information on electrical safety testing.</p> <p>If testing with A6, Refer to <b>MN-124 (6100-098) vPad-A6 Operators Manual</b> for further information.</p> <p>If testing with NFPA, Refer to <b>MN-100 (6100-084) vPad-NFPA Operators Manual</b> for further information.</p>
		<p>After all measurements of the safety test have been completed, you are presented with a menu for copying the acquired results to the Test Record. The result of the safety test will be shown as "PASS" or "FAIL". Comments on the safety test may be input by tapping the <b>"Final Comments"</b> box. Press the <b>"Save Safety Test"</b> button to leave vPad-&lt;safety test&gt; and return to the Checklist.</p>


Checklist Step	Example Display	Operation
<i>ECG Test</i>		<p>A Checklist may include steps that operate the vPad ECG simulator. The waveform produced by the simulator is indicated at the top of the screen. To input comments or measurement data, tap on the <b>"Comments/Data"</b> box to display the Android keypad. Observe the response on the patient monitor under test, then select the appropriate result (pass; fail; etc).</p>
<i>Remote Control</i>		<p>A Checklist may include steps where an external device, such as a test instrument or a patient simulator, is remotely controlled by the vPad. Remote control steps will require the use of an <b><i>MBOX Interface</i></b>, a hardware "smart cable" which is used to connect external devices to the XBUS Port of the vPad. Through the MBOX Interface, a Checklist may send control commands to operate an external test instrument or simulator. Additionally, the MBOX Interface can receive measurement data or test results from an external instrument and return the data to vPad for display by the Checklist, as shown at left. For more information on using MBOX to interface vPad to external devices, refer to <b><i>MN-084 6100-049 vPad-Check Operator's Manual</i></b>.</p>



Checklist Step	Example Display	Operation
<p><b>Save Test Record</b></p>		<p>After all steps of the Checklist have been completed, results recorded during the procedure are displayed. Following this step, a menu for saving a Test Record is shown. If an equipment ID has not been entered at this point, you will be prompted to enter one.</p> <p>The <b>"Next test due date"</b> field is the date at which the equipment becomes due for its <i>next</i> inspection or service. The preset date which is initially shown can be modified by tapping the field to activate the Android keypad, it can also be disabled if required to meet the CMMS requirements. Note the displayed date may be obtained from a CMMS equipment data file (<b>EQUIPMENT.CSV</b>). If there is no CSV file on the tablet, or if the file does not contain a due date for the specified equipment, then the date is derived automatically from a default inspection interval as set by the <b>vPad Settings</b> app . Refer to <b>MN-129 vPad Settings Operator's Manual</b> for more information on this and other shared settings of the vPad automation system.</p> <p>Total time spent servicing the equipment may be input after tapping the <b>"labour time"</b> field. This entry will supplement the Checklist runtime in the Test Record. Test report title and final comments may be entered after tapping the respective field.</p> <p>When ready, press <b>"Create Record"</b> to save the Test Record to this folder:</p> <p><b><code>/mnt/sdcard/Datrend/vPad-Check/Records<sup>†</sup></code></b></p> <p>For more details, refer to <b>MN-084 vPad-Check Operator's Manual</b>.</p>

Checklist Step	Example Display	Operation
<i>Print Inspection Label</i>		<p>After a Test Record is saved, the <b>"Print Label"</b> menu is shown if label printing has been enabled by the <i>vPad Settings</i> app  (see manual <i>MN-129</i>). This menu displays information as it will be printed on the inspection label, for example, the equipment ID, test date and the next test due date. When the printer is ready to print, press the <b>"Print Label"</b> button. Multiple labels may be printed if necessary. When done, press <b>"Exit"</b> to return to the main menu of vPad-mT.</p>

The above table provides some examples of displays that may be shown during Checklist execution, but is intended as a summary only. For complete details and instructions, refer to Chapter 3 and 4 of *MN-084 6100-049 vPad-Check Operator's Manual*.



† Note: **sdcard**, or alternatively **internal\_sd** on some tablets, refers to *internal memory* of the Android tablet.

**sdcard** is NOT a removable "SD Card" memory device, which may be optionally plugged into the external card slot of the tablet.

Any accessory SD Card which may be plugged into the tablet's card slot is referred to as **external-sd** in the Android file system.

### 3.4 medTester Checkitem Translation

A PM or other procedure may be created within a Computerized Maintenance Management System (CMMS) by selecting medTester **checkitems** from a database and combining these items into a list of tasks known as a "Checklist". A medTester checkitem has a **type** that is specified by a single letter which will determine the medTester's function when the checkitem is encountered during execution of the Checklist. The following table lists the defined checkitem types and their corresponding medTester functions.

Checkitem Type	medTester Function
P	PASS/FAIL prompt. Place a message on the LCD display of the medTester and wait until the user presses a "PASS" or "FAIL" button on the medTester's keyboard.
I	Input request. Display a message on the medTester's LCD and wait until the user types a response (alphanumeric text) via the medTester's keyboard.
B	Both PASS/FAIL and data entry. A combination of 'P' and 'I' functions above.
M	Execute an internal hardware function, such as apply power to the medTester's test receptacle or run the medTester's ECG simulator. The particular function performed by the 'M' checkitem depends on the command string associated with the item. This checkitem may also be used to perform timed delays, or communicate with external test instruments via RS-232 serial connection.
A	Launch an internally-stored program which causes the medTester to execute an automated sequence of test measurements, for example, an electrical safety test. These automated tests are called "AutoSequences". The medTester's AutoSequence programs are uniquely identified by corresponding "Axx" reference names which range from "A1" to "A89" inclusive.

vPad Checklists are computer programs comprised of **statements** written in the vPad Programming Language (vPL). When the user selects a Checklist or Equipment ID in vPad-mT, the App reads the medTester Checklist and **translates** it into a temporary instruction file called **medTester.vpl**. This file is then passed to the vPad-Check App which executes the file as described in Section 3.3.2.

This section describes how vPad-mT translates medTester checkitems to statements in the vPad Programming Language. Once you understand how the translation works, you will be able to use your CMMS to maintain existing Checklist procedures or create new procedures that will run successfully on both the legacy medTester platform and the modern vPad platform.

This section assumes some familiarity with the vPad Programming Language or "**vPL**". For more information on vPL, refer to Chapter 4 of **MN-084 6100-049 vPad-Check Operator's Manual**.

### 3.4.1 "P" Checkitem Translation

The pass/fail or "P" checkitem is the most common checkitem used with a medTester. It causes medTester to place a message on its LCD display and then wait until the user presses a "PASS" or "FAIL" button on the medTester's keyboard.

The "P" checkitem translates to a vPL statement having a "check" keyword which is followed by a message in quotes. The "check" statement causes vPad to display the specified message along with "PASS", "FAIL" and other radio buttons. The "check" statement also causes a Comments/Data field to be displayed on the tablet screen. This allows the user to optionally enter additional information regarding the test.

Here are some example translations for medTester "P" checkitems:

<u>medTester Checkitem</u>	<u>vPL translation</u>
<b>P, Line Cord...inspect</b>	<b>check "Line Cord...inspect"</b>
<b>P, Strain Reliefs...inspect</b>	<b>check "Strain Reliefs...inspect"</b>
<b>P, Circuit Breaker...check operation</b>	<b>check "Circuit Breaker...check operation"</b>

### 3.4.2 "I" Checkitem Translation

The input or "I" checkitem causes medTester to display a message and then wait for the user to input information via the medTester's keyboard. Since it is not mandatory to enter data when an "I" checkitem is displayed, this checkitem may also be used to prompt the user or provide an instruction.

A limitation of the medTester is that it can only display single-line messages. As a work-around, some medTester users have adopted a convention where a '>' character is placed at the end of an "I" checkitem to indicate "there is more to follow". When a '>' is seen on the medTester LCD, it means the Checklist should be advanced to the next step to read the following line of the message.

The "I" checkitem translates to a vPL statement having a "check" keyword, and a message in quotes. This checkitem is treated the same as the "P" checkitem.

If the Checklist includes a series of consecutive "I" checkitems which are connected by means of '>' characters, these Checkitems will be combined into a single "check" statement.

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Here are some example translations for medTester "I" checkitems:

<u>medTester Checkitem</u>	<u>vPL translation</u>
<b>I, Record software version</b>	<b>check "Record software version"</b>
<b>I, Record fluid level</b>	<b>check "Record fluid level"</b>

Below is an example of how a series of consecutive checkitems in a medTester Checklist would be combined by vPad-mT into a single statement. Sometimes, checkitems in the middle of a series may include a '>' character at the beginning as well as at the end, although these leading '>' are not really required. If any leading '>' are found in a series of consecutive checkitems, they are deleted before the checkitems are joined to form the finished statement.

### medTester Checkitems

**I, SELECT (4) ON THE BIOMED SERVICE MENU >  
I, AND CHOOSE OPTION (B). WAIT FOR THE >  
I, TEST TO COMPLETE, THEN RECORD RESULT**

### vPL translation

**check "SELECT (4) ON THE BIOMED SERVICE MENU AND CHOOSE OPTION (B). WAIT FOR THE TEST TO"\+  
" COMPLETE, THEN RECORD RESULT"**

### 3.4.3 "B" Checkitem Translation

The "B" checkitem combines "P" and "I" checkitem functions of the medTester, that is, it provides **"Both"** pass/fail and information input.

As far as vPad-mT is concerned, a "B" checkitem has the same translation as an "I" checkitem. However, unlike "I" checkitems, the '>' character has no effect on how a "B" checkitem is handled. If a '>' character appears in a "B" checkitem, this character is copied across to the vPL "check" statement without modification.

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Here are some examples:

### medTester Checkitem

B, Casters & brakes...check operation  
B, Fuses...check value & spare  
B, CLEAN/REPLACE FILTERS AS NEEDED  
B, CHECK BATTERY > 10 VOLTS

### vPL translation

check "Casters & brakes...check operation"  
check "Fuses...check value & spare"  
check "CLEAN/REPLACE FILTERS AS NEEDED"  
check "CHECK BATTERY > 10 VOLTS"

Note that a "B" checkitem may be the last in a series of checkitems that have been joined by the '>' character. Here is an example of how this may be applied:

### medTester Checkitems

I, Select (8) on the Biomed Service Menu>  
I, and choose Option (A). Wait for the >  
I, test to complete. Record the power >  
B, level and confirm it is > 500 mW.

### vPL translation

check "Select (8) on the Biomed Service Menu and choose Option (A). Wait for the test to\"  
" complete. Record the power level and confirm it is > 500 mW."

## 3.4.4 "M" Checkitem Translation

An "M" checkitem may cause the medTester to perform an internal hardware function. For example, "M" checkitems may be used to control the medTester's test receptacle or select a waveform of the medTester's ECG simulator. Such checkitems are referred to as medTester "internal commands".

In addition to medTester internal commands, the "M" checkitem can also cause a medTester to pause for a specified number of seconds before proceeding with the next step of the Checklist. Such checkitems are referred to as medTester "pause commands".

Lastly, the "M" checkitem may be used to send messages from a medTester to a remote test instrument or a patient simulator through a RS-232 connection. Such checkitems may therefore be used to control a remote device or retrieve test data from a device, and are referred to as "remote commands".

The following sections explain how vPad-mT translates medTester internal, pause and remote commands to vPad Programming Language.

### 3.4.4.1 Internal Commands

Some internal hardware functions of the medTester instrument have a correspondence with similar functions provided by the vPad safety analyzer. The medTester internal commands for these functions are translated to vPL as follows:

<u>medTester Checkitem</u>	<u>vPL Translation</u>	<u>Function</u>
M, TRPN	power on	Switch test receptacle ON
M, GTOL	power off	Switch test receptacle OFF
M, EXIT	power off	Switch test receptacle OFF
M, W000	ecgsim 30   input	Set ECG simulator to ASYS
M, W001	ecgsim 1   input	Set ECG simulator to SQR 2Hz
M, W002	ecgsim 3   input	Set ECG simulator to PUL 4sec
M, W003	ecgsim 8   input	Set ECG simulator to SIN 10Hz
M, W004	ecgsim 9   input	Set ECG simulator to SIN 40Hz
M, W005	ecgsim 11   input	Set ECG simulator to SIN 60Hz
M, W006	ecgsim 12   input	Set ECG simulator to SIN 100Hz
M, W007	ecgsim 6   input	Set ECG simulator to SQR 1KHz
M, W008	ecgsim 2   input	Set ECG simulator to TRI 2Hz
M, W009	ecgsim 17   input	Set ECG simulator to CMMR 60Hz
M, W010	ecgsim 19   input	Set ECG simulator to 30 BPM
M, W011	ecgsim 20   input	Set ECG simulator to 60 BPM
M, W012	ecgsim 21   input	Set ECG simulator to 120 BPM
M, W013	ecgsim 23   input	Set ECG simulator to 240 BPM
M, W014	ecgsim 7   input	Set ECG simulator to SIN 0.5Hz
M, W015	ecgsim 26   input	Set ECG simulator to AFIB
M, W016	ecgsim 27   input	Set ECG simulator to SVT
M, W017	ecgsim 27   input	Set ECG simulator to SVT
M, W018	ecgsim 20   input	Set ECG simulator to 60 BPM
M, W019	ecgsim 21   input	Set ECG simulator to 120 BPM
M, W020	ecgsim 29   input	Set ECG simulator to PVC
M, W021	ecgsim 29   input	Set ECG simulator to PVC
M, W022	ecgsim 29   input	Set ECG simulator to PVC
M, W023	ecgsim 29   input	Set ECG simulator to PVC
M, W024	ecgsim 29   input	Set ECG simulator to PVC
M, W025	ecgsim 29   input	Set ECG simulator to PVC
M, W026	ecgsim 29   input	Set ECG simulator to PVC
M, W027	ecgsim 27   input	Set ECG simulator to SVT
M, W028	ecgsim 28   input	Set ECG simulator to VTACH
M, W029	ecgsim 25   input	Set ECG simulator to VFIB
M, W030	ecgsim 30   input	Set ECG simulator to ASYS

Note that with respect to "Wxxx" checkitems, the vPad ECG simulation which most closely matches the original medTester waveform is chosen by vPad-mT.

Note also that medTester has internal command functions in addition to the ones listed above. These functions are specific to the medTester instrument and have no correspondence in vPad; if found by **CMX** software, they may be modified or eliminated from the CMMS **MTEXPORT** files before the files are transferred to the Android tablet (see Section 1.2, page 1).

### 3.4.4.2 Pause Commands

medTester pause commands are recognized as "M" checkitems with a specific format. They are translated by vPad-mT according to these rules:

<u>medTester Checkitem</u>	<u>vPL Translation</u>
<b>M</b> , <number>	<b>prompt</b> "Pause <number> seconds..."   <b>normal</b>   <number>
<b>M</b> , <number><whitespace><comment>	<b>prompt</b> "<number><whitespace><comment>"   <b>normal</b>   <number>

In the "M" checkitems shown above, <number> is the required delay in seconds and the optional <comment> is a message which is displayed on the medTester LCD while the timer is running.

### 3.4.4.3 Remote Commands

If an "M" checkitem is not an internal command or a pause command, then the command is treated as a remote command for interfacing with an external test instrument or patient simulator. Remote commands are translated by vPad-mT according to these rules:

<u>medTester Checkitem</u>	<u>vPL Translation</u>
<b>M</b> , <command>	<b>xtest</b> "Remote command:\n<command>"   <command><whitespace> <b>5</b>
<b>M</b> , <command><whitespace><number>	<b>xtest</b> "Remote command:\n<command>"   <command><whitespace><number>
<b>M</b> , <command><whitespace><comment>	<b>xtest</b> "<comment>"   <command><whitespace> <b>5</b>
<b>M</b> , <command><whitespace><number><whitespace><comment>	<b>xtest</b> "<comment>"   <command><whitespace><number>

In the "M" checkitems shown above, <command> is a message which is transmitted by the host (medTester or vPad) and which will cause the attached test instrument or patient simulator to perform a specific function. Such commands will be specific to each make and model of test device; refer to technical documentation for the device to obtain the command specifications and



the corresponding device functions which have been implemented.

Parameters which follow a remote **<command>** in a "M" checkitem will cause medTester to wait a specified number of seconds for a response from the remote device, or display a prompt on the LCD, or both wait and display a prompt. Refer to the technical documentation of the medTester for information on application of "M" checkitems for remote control of test devices.

As shown above, vPad-mT translates all remote commands to corresponding **xtest** statements. vPad-mT creates these statements specifically for use with the ***MBOX Interface***. An MBOX Interface is a hardware "smart cable" which is used to connect external devices to the XBUS Port of the vPad. Through the MBOX, the "M" checkitems shown above can send remote control commands to operate an external test instrument or a patient simulator. Additionally, the MBOX can receive measurement data or test results from an external instrument and return the data to vPad for display by the Checklist.

MBOX accessories are available for either cabled or wireless connection to instruments and simulators. For more information on connecting MBOX to external devices, refer to ***MN-084 6100-049 vPad-Check Operator's Manual***.

#### **3.4.4.4 MBOX Setup Commands**

When power is initially applied to an MBOX "smart cable", the interface defaults to communicating with a remote test device at a serial baud rate of 9600. Other serial communication settings such as inter-character transmission delay and message-terminating character are also set to default values. These default settings are compatible with a wide range of biomedical test instruments, including current devices and legacy equipment from many manufacturers.

For some applications, the default communication settings of the MBOX Interface will need to be modified to suit a particular test device. In these cases, specific "M" checkitems may be inserted near the beginning of a Checklist to cause vPad-mT to configure the MBOX for a given application. After these configuration steps, additional "M" checkitems as described in Section 3.4.4.3 may then be used to control the target instrument or simulator.

Checkitems for configuring the MBOX Interface are listed below. The user will create one or more of these checkitems in the CMMS database and then add the checkitems to those Checklists that require them.

<u>CMMS Checkitem</u>	<u>MBOX Configuration Function</u>
<b>M, XOPEN</b>	Reset the MBOX Interface to power-on defaults. Although not mandatory, it is recommended that this checkitem be placed near the start of each CMMS Checklist that includes "M" checkitems which remotely control a testing device, even if the device's serial baud rate is 9600.
<b>M, }BR1{</b>	Set baud rate to 2400
<b>M, }BR2{</b>	Set baud rate to 4800
<b>M, }BR3{</b>	Set baud rate to 9600 (default)
<b>M, }BR4{</b>	Set baud rate to 19K2
<b>M, }TD0{</b>	Set transmit inter-character delay to zero (default)
<b>M, }TD1{</b>	Set transmit inter-character delay to 5 msec
<b>M, }TD2{</b>	Set transmit inter-character delay to 10 msec
<b>M, }TD3{</b>	Set transmit inter-character delay to 50 msec
<b>M, }TD4{</b>	Set transmit inter-character delay to 100 msec
<b>M, }TD5{</b>	Set transmit inter-character delay to 250 msec
<b>M, }TD6{</b>	Set transmit inter-character delay to 500 msec
<b>M, }EC0{</b>	Set end-of-command terminator = none
<b>M, }EC1{</b>	Set end-of-command terminator = carriage return (CR, default)
<b>M, }EC2{</b>	Set end-of-command terminator = line-feed (LF)
<b>M, }EC3{</b>	Set end-of-command terminator = CRLF
<b>M, }EC4{</b>	Set end-of-command terminator = LFCR

### 3.4.5 "A" Checkitem Translation

The "A" checkitem causes medTester to call an internal AutoSequence program during execution of a Checklist. medTester AutoSequences are numbered from "A1" to "A89". Translation of the "A" checkitem to vPL depends on which medTester AutoSequence has been invoked by the checkitem. There are two general cases: electrical safety tests and device performance tests.

#### 3.4.5.1 Electrical Safety AutoSequences

vPad-mT translates "A" checkitems for medTester electrical safety tests "A1" through "A17" to vPL "run" statements that call the vPad-AS app:

<u>medTester Checkitem</u>	<u>vPL translation</u>
A, AUTOSEQUENCE A1	run vPad-AS   1
A, AUTOSEQUENCE A2	run vPad-AS   2
A, AUTOSEQUENCE A3	run vPad-AS   3
A, AUTOSEQUENCE A4	run vPad-AS   4
...	...
A, AUTOSEQUENCE A16	run vPad-AS   16
A, AUTOSEQUENCE A17	run vPad-AS   17

AutoSequences #1 through #17 of vPad-AS are installed with the App and are copies of factory-default AutoSequences A1 through A17 provided with a medTester. If default settings have been modified on a medTester, the vPad-AS App may be used to edit the safety test settings to match the medTester's setup. Refer to **MN-079 (6100-045) vPad-AS Operators Manual** on the tablet.

#### 3.4.5.2 Performance Test AutoSequences

medTester AutoSequences "A20" to "A89" are performance tests for defibrillators, pacemakers, ESUs, and other medical devices. These AutoSequences require the use of external test instruments or analyzers to perform one or more measurements on the device under test.

When an "A" checkitem for AutoSequence "A20" or higher is found in a medTester Checklist, vPad-mT will insert a corresponding "AutoSequence program file" into the Checklist output file **medTester.vp1**. vPad "AutoSequence programs" are designated by filenames ranging from **A20.vp1** to **A89.vp1** and are stored in the AutoSequences folder of the vPad-mT directory. A summary of the factory-default medTester AutoSequences and their corresponding vPad programs is given in the following table.

Performance Test	medTester		vPad	
	AutoSequence ID's	Test equipment required	AutoSequence Programs	Test equipment required
Trans. Pacemaker	A20 to A29	Impulse 4000	A20.vpl to A29.vpl	Any defib/pacer analyzer
Defibrillator	A30 to A49	Impulse 4000	A30.vpl to A49.vpl	Any defib analyzer
Infusion Pump	A50 to A59	IDA-4 or Infutest 2000	A50.vpl to A59.vpl	Any IV pump analyzer
ESU	A60 to A69	Model 454A	A30.vpl to A49.vpl	Any ESU analyzer
Pulse Oximeter	A70 to A79	CardioSat or Oxitest	A70.vpl to A79.vpl	Any SpO2 simulator
NIBP Monitor	A80 to A89	CuffLink	A80.vpl to A89.vpl	Any NIBP simulator

To allow any make or model of biomedical test equipment to be used, the AutoSequence programs installed with vPad-mT rely on user-input of measurements with **limtst** statements. Because **A20.vpl** to **A89.vpl** are vPL programs, they may be customized just like any other vPad Checklist. Pass/fail limits can be modified to suit various models of defibrillator, pacemaker, ESU and so on. Remote control can be implemented in the AutoSequence programs to automatically acquire test results from external test instruments, using the MBOX Interface and/or other smart cable accessories for vPad. The AutoSequence programs can be modified or new ones written using any text editor. Refer to Chapter 4 of *MN-084 6100-049 vPad-Check Operator's Manual* for more information on programming vPad Checklists using the vPad Programming Language.

Here are some examples of how medTester "A" checkitems for performance tests are translated by vPad-mT:

medTester Checkitem

**A, AUTOSEQUENCE A38**

**A, AUTOSEQUENCE A61**

vPL translation

Copy vPL program from:  
**Datrend/vPad-mT/AutoSequences/A38.vpl**

Copy vPL program from:  
**Datrend/vPad-mT/AutoSequences/A61.vpl**

vPad-mT will accept AutoSequence numbers greater than A89 up to A99999, provided the corresponding **Axxx text.vpl** program files exist in **Datrend/vPad-mT/AutoSequences**. This enables creation and use of new AutoSequence programs which will supplement the original 70 performance tests A20-A89 provided by the medTester. The **text** in the filename is optional and can be used to describe the contents of the file. The **A####** is the portion of the filename that identifies which AutoSequence is to be used.

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Some CMMS systems will allow capitals only, some allow a combination of cap and small letters. The following formats will be accepted :

### medTester Checkitem

### vPL translation

**A, AUTOSEQUENCE A100**

Copy vPL program from:  
**Datrend/vPad-mT/AutoSequences/A100.vpl**

**A, AUTOSEQUENCE A100 Bed, Electric**

Copy vPL program from:  
**Datrend/vPad-mT/AutoSequences/A100  
Bed,Electric.vpl**

**A, Autosequence A100**

Copy vPL program from:  
**Datrend/vPad-mT/AutoSequences/A100  
Bed,Electric.vpl**

**A, Autosequence a100**

Copy vPL program from:  
**Datrend/vPad-mT/AutoSequences/A100  
Bed,Electric.vpl**

**A, A100**

Copy vPL program from:  
**Datrend/vPad-mT/AutoSequences/A100.vpl**

To be more flexible, vPad-mT has been modified to also accept the format A#####\$\$\$, where # is (up to 5) numeric values and \$ is (up to 3) alphanumeric. For instance A23654g4s or A654BTa

Some CMMS systems will not allow an Autosequence to have additional words other than the Axxx indicator, and if additional words are entered, will change the Check Item to be a type I statement. vPad-mT will recognize this situation and accept it as an Autosequence.

**I, AUTOSEQUENCE A100 Bed, Electric**

Copy vPL program from:  
**Datrend/vPad-mT/AutoSequences/A100  
Bed,Electric.vpl**

### 3.4.5.3 Inserting vPL Program Code in Checklists

Although the format of a medTester "A" checkitem is typically

**A, AUTOSEQUENCE Ann**

*some* CMMS applications will allow users to enter arbitrary text for a "A" checkitem. This provides a way for CMMS users to write vPL program code directly within the CMMS database.

If the command string of an "A" checkitem does not begin with the word "**AUTOSEQUENCE**", vPad-mT simply copies the command text of the checkitem directly to the output **medTester.vpl** program without modification. Here are some examples of how this technique may be used:

<u>CMMS Checkitem</u>	<u>vPL translation</u>
A, prompt "Review service manual"	prompt "Review service manual"
A, ecgsim 20 bpm 3	ecgsim 20 bpm 3
A, limtst "Check battery" V min 7.5	limtst "Check battery" V min 7.5



## 4 Appendix A - Tables in WebTMA

Certain information which is transferred to WebTMA with the test reports must conform to the validated information in the Client database, in the form of tables. These tables of data are downloaded from WebTMA using the vPad-TMA app. Data in these tables is available for updating or creating device information in WebTMA. When running a Work Order, device information is presented in the Equipment Information screen that can be changed, as necessary, to improve the accuracy of the data in WebTMA. When running a test as a Task\Checklist, certain information is mandatory and must be filled or WebTMA will reject the associated creation of the device and its work order.

### 4.1 Running a Checklist

A test is started by selecting the required Checklist (*Figure 2*, page 8), or alternatively an equipment ID (*Figure 3*, page 9). In the latter case, a Checklist which has been assigned by your CMMS to the equipment will be executed.

vPad-mT begins by translating the medTester Checklist provided by your CMMS to vPad format. You are then prompted to enter information about the equipment under service. When using WebTMA and vPad-TMA, it is required that equipment information be downloaded from WebTMA using the **GET DATA\Equipment** option. If a test is initiated by equipment ID, then some or all of the equipment information may be populated automatically by vPad-mT.

After inputting or confirming the equipment information, you will then step through this Checklist procedure one step at a time, pausing to read instructions, inspect items, and enter data as required by the procedure. Electrical safety tests and device-specific performance tests may also be executed during the procedure. At the end of the Checklist, a Test Record is saved and an inspection label may be optionally printed. On completion of the Checklist, you are returned to the main menu from which you started.

This section provides a summary of Checklist execution, beginning with the menu for entry of the equipment information. For additional information on Checklists, refer to *MN-084 6100-049 vPad-Check Operator's Manual*.



### 4.1.1 Equipment Information


When a PM inspection or maintenance procedure (Task\Checklist) is started, the first screen shown will be for entering information about the equipment. When starting from the Checklist menu (*Figure 2*, page 8), the equipment information fields will not be populated. A work order can be started from a Checklist selection if the device is not scheduled for maintenance (this is an adhoc\corrective maintenance service), or this is an incoming inspection for a new device.

*Figure 31 - Equipment Information menu.*

Tap on a text field to display the Android keyboard and enter information. If an external keyboard is connected to the tablet, the Android keyboard is not displayed and data entry is then accepted from the external input device. A barcode scanner can also be used for data entry.

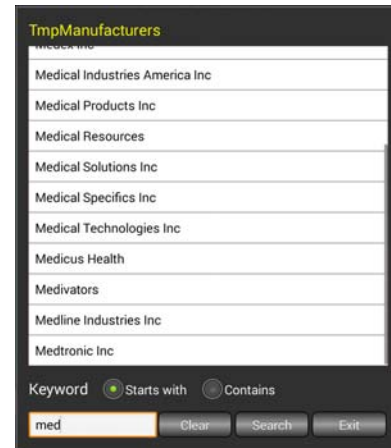
As can be seen from *Figure 31* above, enabling **Add Extra Tables** in the **Settings** screen adds four additional buttons to the main **Equipment Information** screen, which are related to an equipment information data Cache or Clipboard. These buttons are labelled; **Undo**, **Clear Cache**, **Recall Cache** and **Save to Cache**. The Cache allows specific information on a device to be saved and then recalled, as needed. This feature is useful for incoming inspection of new devices. As certain information must be entered before a new device can be created or a work order saved, recalling information from a template is the easiest way to (almost) completely fill out the fields.

**New Device(s)\Incoming Inspection:** If you are receiving one or more devices for incoming inspection, the following process is recommended. Identify an existing device of the same description\make\model or something very close. If you do not know a specific device ID, you could use **Search** to select a device close to what you are now receiving. Go to the **Checklist** display and select a **Checklist** related to the

device you are receiving, or possibly an 'Incoming Inspection' Checklist. When the blank **Equipment Information** screen is displayed select **Search**. This will allow you to search for an existing device based on **Serial Number, Description, Manufacturer, Model** and/or **ID Number** from the display shown in *Figure 21*. The search can be made in any order of the five fields displayed. For instance, if you elect to search by manufacturer first, press the manufacturers table icon, , search for the manufacturer(s) and select (touch on) the appropriate one.




*Figure 32 - Search for Device*



*Figure 33 - Search for Manufacturer*

The search is initiated when the value for the parameter is selected, in this case Medtronic Emergency Response Systems. As the first search is completed, the tables for the remaining fields will be reduced to match the results of the first search. For this example, you would return to the screen of *Figure 23*, with the **Manufacturer** filled in, indicating the manufacturer search was complete. Now, a second search based on a reduced list of **Models** or **Descriptions** could be done. When you feel the search is complete enough, select **OK** to return the **Device ID** of the first device encountered in the Equipment list, that matches the search criteria.



*Figure 34 - Manufacturer Search Complete*

At this point, **Equipment Information** for the **Device ID** found will be populated, and the amount of editing of the fields should be minimal. Due to the file structure for the equipment information, the Location may not get populated. Press **Search** again to retrieve the **Location** information. Normally **Device ID**, **Serial Number** and possibly a couple of the other table entries such as floor or repair center may need to be modified. Select **Save to Cache** to update your device template. You can now run the **Checklist** for the new device number and generate a test report based on the **Checklist** that was chosen. Once the test is finished, you are returned to the **Checklist** screen. If you need to receive another of the same type of device, select the **Checklist** and on the **Equipment Information** screen press **Recall Cache**. You will now have the previous device's data shown on the screen. Change the **DeviceID**, **Serial Number**, and other fields as necessary and run the test. **DeviceID** and **Serial Number** are recalled as some can be quite long and it is easier to change one or two digits instead of re-typing 15-20 from scratch.

**Existing Device\Adhoc Work Order:** In some instances, you may come across a device that is not scheduled for testing, but it is convenient to do something now that the device has been located. In this case, a **Checklist** would be selected and the **DeviceID** entered into the **Equipment Information** screen. Collapse the keyboard and select the **Search** button. If the device is in the equipment information file that you have previously downloaded for this facility, it should be located and the relevant device information will populate the information screen and tables.

The screenshot displays the 'Equipment Information' screen with the following data:

Equipment Information	
Checklist: Analgesia Unit	
ID Number:	40SCB-40-26997
Serial Number:	5002 4001
Manufacturer:	Scale-Tronix Inc (101694)
Facility:	San Carlos (11477)
Technician ID:	RD (RD)
Work Order:	
Work Order Type:	Choose
Description:	Scales, Patient, Platform, Electronic (18
Model:	5002
Location:	159 (4133-159)
Next Test Due:	


Buttons at the bottom: Undo, Clear Cache, Recall Cache, Save to Cache, Cancel, Erase All, Search, Run Test.

*Figure 35 - Successful equipment search after ID entry.*

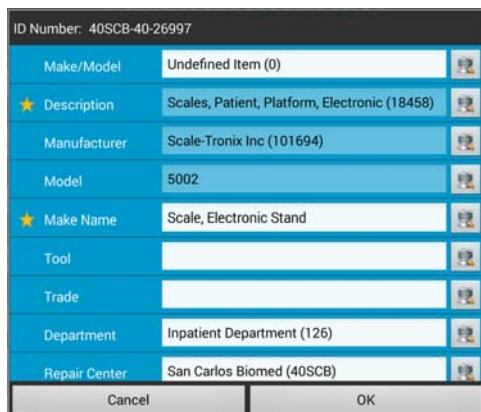
In the event an ID is not found, an error message is displayed. You may modify the ID and press **Search** to try again.

**Scheduled Work Orders:** You may also start a PM inspection or maintenance procedure by selecting an equipment ID from the **ID Number (WO#)** list of *Figure 3* (page 9). If the equipment file is present, vPad-mT will search the file for the ID. If the ID is found, the information fields on the **Equipment Information** screen will be populated automatically. Confirm the displayed equipment information is correct then press **"Run Test"** to begin the **Checklist**.

**Clear Cache\Undo:** The remaining two buttons related to the Cache are **Clear Cache** and **Undo**. **Clear Cache** will clear the contents of the Cache. Any subsequent Recall Cache requests will return blanks. The **Undo** button will recall the last contents of the Cache, in case the Cache was cleared by accident.

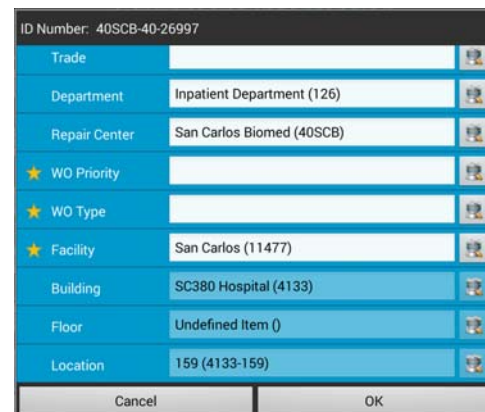
**Using the Tables:** In many cases, device or work order information data is standardized through the use of tables. These Tables can be accessed by touching the icon above the **Save Cache** button, . *Figure 25* and *Figure 26*, *Figure 27*, *Figure 28* show the data that is relevant to doing work orders and creating new devices. If a work order is scheduled, it and its deviceID will appear in the **ID Number** listing, and if selected, any data transferred from WebTMA will be available here for display.

There are certain interdependencies for two of the parameters: **Make/Model** and Facility. **Make\Model** defines a relationship between a **Description**, **Manufacturer**, **Model** and **Make Name**. Selecting a **Make\Model** will automatically define the next 4 fields. If the **Make\Model** is not defined for this device in WebTMA, it is possible to define the four fields above individually. To do this, the Make/Model field must be blank. This can be accomplished quickly by touching and holding on the Make/Model field until the field goes blank.



ID Number: 40SCB-40-26997	
Make/Model	Undefined Item (0)
★ Description	Scales, Patient, Platform, Electronic (18458)
Manufacturer	Scale-Tronix Inc (101694)
Model	5002
★ Make Name	Scale, Electronic Stand
Tool	
Trade	
Department	Inpatient Department (126)
Repair Center	San Carlos Biomed (40SCB)
<input type="button" value="Cancel"/> <input type="button" value="OK"/>	


*Figure 36 - Data Tables 01*




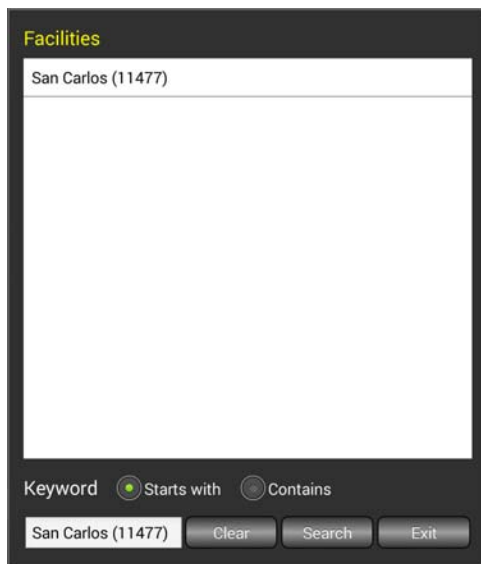
ID Number: 40SCB-40-26997	
Trade	
Department	Inpatient Department (126)
Repair Center	San Carlos Biomed (40SCB)
★ WO Priority	
★ WO Type	
★ Facility	San Carlos (11477)
Building	SC380 Hospital (4133)
Floor	Undefined Item (0)
Location	159 (4133-159)
<input type="button" value="Cancel"/> <input type="button" value="OK"/>	

*Figure 37 - Data Tables 02*

**Building**, **Floor** and **Location** are all related to the **Facility**. To change any of these three, a **Facility** must first be selected (even if it is the same one), followed by the **Building**, then the **Floor** and/or **Location**.

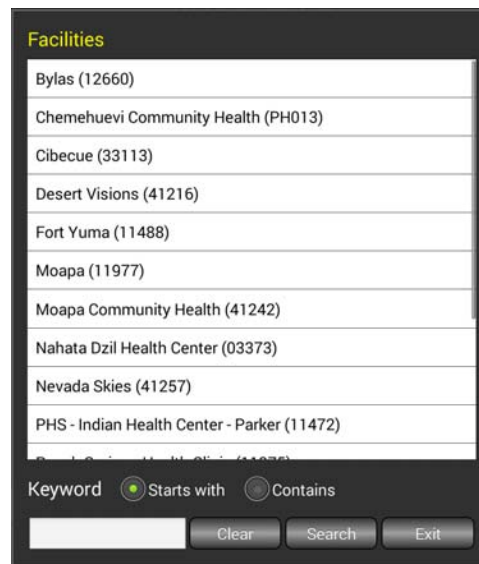
Fields that are mandatory are indicated with a star, . If you try to save the Table entries by pressing **OK**, and one or more mandatory fields is not entered, you will receive an error message. All mandatory fields must have a valid entry to be saved.

Of all of the tables available, all but 2 are predefined by the download of data from WebTMA. For the predefined tables, selections can be made by touching on the **Open Table** icon, , at the right side of the parameter's data field. This will open the table for the parameter, with the current value displayed, as shown in the **Facilities** table in *Figure 29*. If you wish to change the value, the full list can be accessed by first touching the **Clear** button, then the **Search** button. The complete list of values for the parameter will be displayed. The value can be selected by swiping up or down on the list, or searching for a value by entering characters in the text box to the left of the **Clear** button. The search can be based on either the **Starts with**, or **Contains** criteria. When the value of interest is in view, touch on the value to select it and **Exit** to go back to the **Data Table List**, *Figure 25* or *Figure 26*, *Figure 27*, *Figure 28*. These predefined tables can not be modified from within vPad-TMA or vPad-mT.



The screenshot shows a mobile application interface for a 'Facilities' table. At the top, the title 'Facilities' is in yellow. Below it, a single entry 'San Carlos (11477)' is displayed in a white box. At the bottom, there is a search section with a 'Keyword' label, two radio buttons for 'Starts with' (selected) and 'Contains', a text input field containing 'San Carlos (11477)', and three buttons: 'Clear', 'Search', and 'Exit'.

*Figure 38 - Tables Default Value*














The screenshot shows the same 'Facilities' table interface, but with a list of multiple entries. The entries are: 'Bylas (12660)', 'Chemehuevi Community Health (PH013)', 'Cibecue (33113)', 'Desert Visions (41216)', 'Fort Yuma (11488)', 'Moapa (11977)', 'Moapa Community Health (41242)', 'Nahata Dzil Health Center (03373)', 'Nevada Skies (41257)', and 'PHS - Indian Health Center - Parker (11472)'. The search section at the bottom is identical to Figure 38.

*Figure 39 - Table List*

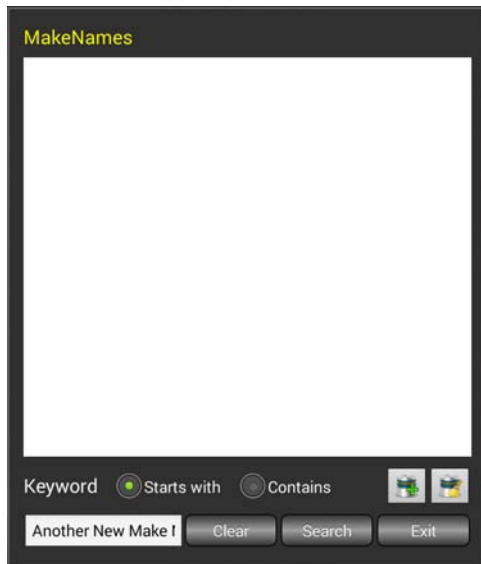
The parameters **Model** and **Make Name** do *not* have predefined tables in WebTMA. Tables for these two parameters are created when the equipment list is downloaded from WebTMA. Values for these two parameters can be entered directly into the text box in *Figure 40*, or can be selected from a list, similar to the predefined parameter tables.

The following process is recommended when trying to enter or change one of these parameters:

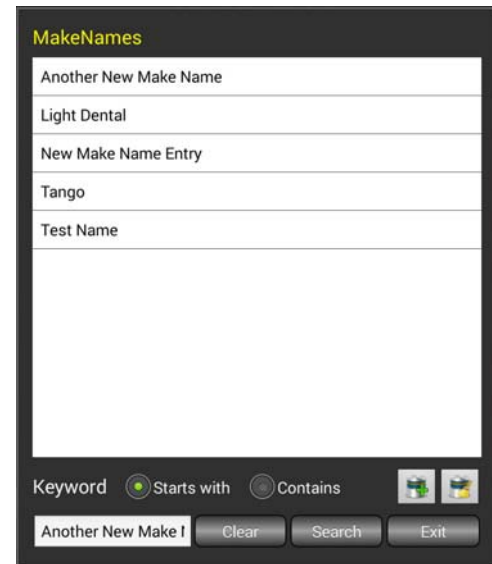
- if the text box of **Figure 40** contains no value or the value is incorrect, touch on the Open Table icon, , to see what values are in the existing list. Initially, the list might be blank.
- touch the **Clear** button, then the **Search** button to retrieve any existing list for the parameter.
- Review the existing list for a suitable value. Select and **Exit** if found.
- If no suitable value is available simply **Exit** to go back to the **Data Table List, Figure 40**.
- To enter a new parameter value, type the value into the parameter text box of **Figure 40**.
- To save this new entry to the parameter table, go to the parameter table screen of **Figure 41** (for example) by selecting the Open Table icon, .

ID Number: 40CRB-999-00002	
Make/Model	Lights, Dental (1020) 
★ Description	Lights, Dental (12351) 
Manufacturer	A-Dec Inc (101028) 
Model	6300 
★ Make Name	Another New Make Name 
Tool	
Trade	
Department	Administration (101) 
Repair Center	Colorado River Biomed (40CRB) 
<div> <div>Cancel</div> <div>OK</div> </div>	


**Figure 40 - Data Tables 01**



*Figure 41 - Special Table List*



*Figure 42 - Special Table List*

- it is evident from **Figure 41** that the new value is not in the existing list, as there is nothing found in the list and displayed in the large list box of **MakeNames**, in this example. To add this new value to the list, select the List Add icon, . The complete list of values for the parameter will be displayed.

- to retain the new value, simply select the new entry to return to the **Data Table List** of **Figure 40**.





## 5 Appendix B - 'Locations' in HEMS

HEMS allows the user to have a default asset Location in the CMMS database. It also recognizes that assets can move; by design (IV pumps), or as a consequence of their usage (pulse oximeters, by EMT staff). Some users would like to know where an asset was found and tested, but not change the default asset location which can help identify the 'owner'. A table of 'official' location data is downloaded from HEMS using the vPad-HEMS app. Data in this table is available for updating or creating an entry for the device location (where tested). When running a Work Order, device information is presented in the Equipment Information screen that is used to provide reasonably complete information on the device, in the test report.

### 5.1 Running a Checklist

A test is started by selecting the required Checklist (*Figure 2*, page 8), or alternatively an equipment ID (*Figure 3*, page 9). In the latter case, a Checklist which has been assigned by your CMMS to the equipment will be executed.

vPad-mT begins by translating, in the background, the medTester Checklist provided by your CMMS to vPad format. You are then prompted to enter information about the equipment under test. When using vPad-HEMS, the equipment information is downloaded from HEMS using the **Receive from HEMS** function. If a test is initiated in vPad-mT by entry of an equipment ID, then some or all of the equipment information may be populated automatically.

The information on the equipment and the work to be done is transferred to the tablet in a file entitled **CMX.TXT**. In addition, this file contains information on the Locations in the facility where the device may have been tested.

If the initial Location indicated on the Equipment Information screen is not the Location where the device is being tested, use the magnifying glass icon in the lower right corner to open a list parameters that can be changed in the test report (Description, Manufacturer, Model, Facility, Location and WO Type). Note that HEMS will only react to a new Location value. Other parameter value changes are only recorded in the test report and will not affect the original asset parameter values in the user database.

For further information on this feature, contact you local HEMS representative.

**Equipment Information**  
Checklist: DEFIB LIFEPAK 12

ID Number: 82196	Work Order: 	Work Order Type: Choose
Serial Number: 32777174	Description: Defibrillator, Life Pak 12	
Manufacturer: Medtronic Emergency Response Syster	Model: LIFEPAK12	
Facility: Bernardo Medical Center	Location: Main	
Technician ID: 00009 Choose	Next Test Due: 01/11/2017	

Cancel Erase All Search Run Test

*Figure 43 - Device Info*

Device ID: 12092013

Description	CAST CUTTER	
Manufacturer	ZIMMER	
Model	8909-01	
Facility	Viking	
Location	3ASU	
WO Type		

Cancel OK

*Figure 44 - Change Location*

## 6 Upgrades and Maintenance

Software Applications (Apps) may be upgraded from time-to-time to provide enhanced features or improvements. Contact Datrend or your local dealer for information on these upgrades.

In some cases, the changes made to an App may be to correct operational issues that have come to the attention of DSI. These shall generally be referred to as maintenance upgrades. In other cases, the changes may be to improve performance or add features which would enhance the overall functionality of the App. The decision to apply a charge to any upgrade shall be solely at the discretion of DSI.

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