

# **MFE 2412 Mark II Stop-On-Defect Scanner Operation and Maintenance Manual**

## **Table of Contents**

<b>Section 1.</b>	<b>Introduction</b>
<b>Section 2.</b>	<b>Magnetic Flux Leakage</b>
<b>Section 3.</b>	<b>MFE 2412 Mark II General Description</b>
<b>Section 4.</b>	<b>MFE 2412 Mark II Operation</b>
<b>Section 5.</b>	<b>MFE 2412 Mark II Maintenance</b>
<b>Section 6.</b>	<b>Ultrasonic Prove Up</b>
<b>Section 7.</b>	<b>Battery Management.</b>
<b>Section 8.</b>	<b>Scanner Adjustments</b>
<b>Section 9.</b>	<b>Nondisclosure Agreement</b>

## **SECTION 1**

### **Introduction**

**This manual has been written to ensure that operators of the MFE 2412 Mark II Stop-On-Defect Scanner have all the information necessary to carry out the best possible examination of any given tank floor. It is strongly recommended that any technician intending to use this equipment read this document in its entirety prior to carrying out any inspections.**

**Any operator using this equipment should be capable of demonstrating a full understanding of the inspection principles involved. Ultrasonic Prove Up should only be carried out by personnel who are adequately trained, certified, and experienced in the evaluation of corrosion type indications. Significant defects can be missed due to improper ultrasonic evaluation of the indications detected by magnetic flux leakage.**

## **SECTION 2**

### **Magnetic Flux Leakage**

**This equipment uses Magnetic Flux Leakage as a detection tool. The powerful magnetic bridge introduces a magnetic flux into the material near to saturation level. Any localized reduction in the thickness of the material will result in a flux leakage at the surface. A series of sensors are placed between the poles of the magnetic bridge to detect these leakage fields. The strength of the leakage field is a function of volume loss and is not a reliable indication of remaining wall thickness. Although the amplitude of the signal generated by the sensors gives some relative severity information it is not recommended that amplitude alone be used for accept/reject criteria purposes. Flux Leakage should only be used as a detection tool. Truly quantitative information can only be obtained using Ultrasonic assessment of the areas identified by the Magnetic Flux Leakage Scanner.**

## **SECTION 3**

### **MFE 2412 Mark II Stop-On-Defect Scanner General Description**

The MFE 2412 Mark II Stop-On-Defect Scanner is comprised of the following modules:

1. Magnet Bridge
2. Sensor Bar
3. Electronics Module
4. Display Battery Module
5. Motor Controller
6. Motor Drive Module
7. Motor Battery Module
8. Handle Assembly
9. Signal and Power Cables

#### **Magnetic Bridge**

The Magnetic Bridge provides the necessary flux levels to achieve saturation of the plate thickness to be inspected. It is supported on four low rolling resistance, durable wheels at each corner allowing easy maneuverability of the scanning head. **Different plate thicknesses and coatings can be accommodated by changing out the wheels as described in Section 8.**

#### **Sensor Bar**

The Sensor Bar contains an array of sensors across the full width of the scanning head. These sensors detect the leakage fields generated by the inspection process. The Sensor Bar extends almost to the outer edge of the wheels allowing maximum possible coverage. It is suspended and spring mounted within the Magnetic Bridge by four studs and adjustable wing nuts allowing the adjustment of the height of the sensors from the inspection surface.

## Electronics Module

The Electronics Module processes the signals from the sensors and displays the data on a twelve channel L.E.D. display panel. The front panel incorporates the controls for power, gain, alarm, and display brightness. A voltage display is incorporated to give a real time battery voltage indication for the Display Battery Module. A fuse holder is mounted on the back panel and contains a 3-amp fuse to protect the electronics in case of a power problem.

**The Electronics Module requires a nominal 12.0 volts to function properly. If the voltage display on the Electronics Module drops below a 12.0-volt reading, discontinue use of the scanner until the Display Battery Module is properly recharged. For important safety reasons, the battery must be recharged using the 1.5-Amp Smart Li-Ion battery charger provided.**

## Display Battery Module

For the MFE 2412 Mark II Stop-On-Defect Scanner, the Display Battery Module contains a 14.8V working-voltage (16.8V peak-voltage), 12.3-amp-hour polymer lithium ion module. This Li-Ion battery contains a protection circuit module designed to prevent the battery from being over-charged and over-discharged. In order to prevent over-discharge, if the battery is discharged to less than 11.0V then the battery will shutdown until recharged. This type of battery is similar in design to the batteries used in laptops and is not regarded as hazardous by the airlines for shipping purposes. The battery can provide power for the Electronics Module for at least 12 hours of continuous use. A 3-amp fuse is located under the top cover to prevent damage to the battery should a short occur within the power supply wiring.

**The Display Battery Module must be recharged using the 1.5-Amp Smart Li-Ion battery charger provided. Failure to use this charger can result in the battery module catching fire and potentially exploding.**

## Motor Controller

The Motor Controller is the interface between the operator and the Motor Drive Module. The front panel incorporates the controls for power, safety-thumb-switch, motor speed, and motor direction (forward and reverse). A lift handle on the back of the Motor Controller offers an easy leverage point for picking the motor drive wheels off the floor and enabling a “manual scanning mode.” A voltage display is incorporated to give a real time battery voltage indication for the Motor Battery Module.

**The Motor Controller requires a nominal 12.0 volts to function properly. If the voltage display on the Motor Controller drops below a 12.0-volt reading, discontinue use of the scanner until the Motor Battery Module is properly recharged. For important safety reasons, the battery must recharged using the 1.5-Amp Smart Li-Ion battery charger provided.**

## Motor Drive Module

The Motor Drive Module contains the motor that drives the MFE 2412 Mark II Stop-On-Defect Scanner. The Motor Drive Module is attached to a stainless steel pivot bar via two quick-release pins. This allows for easy disassembly and reassembly for transportation purposes.

## Motor Battery Module

For the MFE 2412 Mark II Stop-On-Defect Scanner, the Motor Battery Module contains a 14.8V working-voltage (16.8V peak-voltage), 24.6-amp-hour polymer lithium ion module. This Li-Ion battery contains a protection circuit module designed to prevent the battery from being over-charged and over-discharged. In order to prevent over-discharge, if the battery is discharged to less than 11.0V then the battery will shutdown until recharged. This type of battery is similar in design to the batteries used in laptops and is not regarded as hazardous by the airlines for shipping purposes. The battery can provide power for the Motor Drive Module and the Motor Controller for at least 4 hours of continuous use. A 30-amp fuse is located under the top cover to prevent damage to the battery should a short occur within the power supply wiring.

**The Motor Battery Module must be recharged using TWO 1.5-Amp Smart Li-Ion battery chargers provided. Failure to use these chargers can result in the battery module catching fire and potentially exploding.**

## **Handle Assembly**

**The Handle Assembly is connected to the Magnetic Bridge (via two 3/8" bolts, washers, and nylock nuts) and rests on a stainless steel pivot bar. The handle provides mounting points in the form of shoulder bolts and clamping bolts for the Display Battery Module and the Electronics Module. The handle assemble can also be folded in half for transportation. When in use it is locked in place using two quick release pins.**

## **Signal and Power Cables**

**In total, there are three signal cables and two power cables necessary for the proper utilization of the MFE 2412 Mark II Stop-On-Defect Scanner. In order to help facilitate the proper connection of these cables, the cables are all fitted with different connectors. They vary by size and/or number of pins in the connectors. With the exception of the power cable for the Electronics Module, all the cables have the same connector ends and are not direction sensitive. The power cable that connects the Electronics Module to the Display Battery Module can only be connected one way (the connectors on each end of the cable are different and must be matched up correctly to the proper box connector).**

## **SECTION 4**

### **MFE 2412 Mark II Stop-On-Defect Scanner Operation**

#### **Setup**

The scanner is shipped in a custom container case that contains the complete scanning system, battery chargers, tool kit, function test plates, and spare parts.

Connect the cables to the electronics module and to the drive motor module. (These cables should be disconnected for shipping.) The connectors are keyed and are unique for each module and as such can only be connected in the correct configuration.

**WHEN CONNECTING OR DISCONNECTING THESE CABLES TAKE CARE TO TURN THE LOCKING COLLAR ONLY! ANY TURNING OF THE STRAIN RELIEF WILL RESULT IN DAMAGE TO THE WIRES!**

For function test:

The purpose of the function test is to assure that the machine is set up properly and is functioning properly. If the unit is set up as described and performs as described then the unit is ready for tank inspection of 1/4" thick bare steel floors. PLEASE NOTE! If the floor is thicker or has a coating then the set up must be changed to accommodate the actual configuration of plate and coating thickness. Please see Section 8 for Standard and Non-Standard Set Ups. The final set up of speed percentage and gain level will be based on information obtained from ultrasonic prove up. Combinations of speed and gain will provide options for triggering the stop on defect function as regards the particular volume losses encountered on the specific tank floor being inspected.

- 1.) The function test is accomplished by assembling the two function test plates that come with the unit located in the shipping container. The test plates must be placed end to end. The plate with the smallest depth of defect (20% deep conical pit) is placed with the pit end butted to the 2<sup>nd</sup> plate. The 2<sup>nd</sup> plate has a 40% and a 60% deep conical pit. The ends are butted such that the scanner will travel over the 20% pit, the 40% and the 60% in that order.

- 2.) **The kit contains two aluminum U shaped pieces that are approximately 10 inches long. The two plates are connected by sliding these two pieces over the ends of the two plates. The aluminum pieces will overlap each plate approximately 5 inches on each side. The two aluminum pieces serve as a clamp to hold the two plates together.**
- 3.) **When fitted correctly the unit will have an area of no defects, a 20% deep pit, a full screen deflection of all channels at the intersection of the two plates, a 40% deep pit, and a 60% deep pit.**
- 4.) **Turn on the electronics module and the drive motor module by pushing the on/off switch located on the front panel.**
- 5.) **Push the “Up” button on the motor control module panel until the speed percentage reads 50.**
- 6.) **Push the “Up” button on the electronics module until the gain reads 50.**
- 7.) **Push the “Forward” arrow on the motor control panel.**
- 8.) **Turn on the Alarm by pushing the “On” alarm button on the electronics module. The two red LED lights may start flashing. Push the “Reset” button on the electronics module. The red LED lights will stop flashing.**
- 9.) **The unit is ready to function test. Place thumb in the black proximity sensor on the handle. The unit will start to move forward. The unit will pass over the 20% deep pit and a signal will be observed on the screen. The unit will then pass over the ends of the two function test plates at the butted ends. The flux leakage at the butted ends will cause the screen to light up all channels. This level of signal will cause the scanner to stop via the “stop on defect” function. Any signal that is greater than 50% screen height will trigger this “stop on defect” function. Any time the “stop on defect” function is triggered the red LED lights will start to flash and will continue to flash until the reset button is pushed.**
- 10.) **Push the Alarm reset button on the electronics module. The red LED lights will go off. The unit is ready to continue scanning the function test plate.**

- 11.) Place thumb on proximity sensor and the scanner will start to move forward. The scanner will pass over the 40% deep pit. The “stop on defect” function will trigger. The red LED lights will begin flashing and the unit will stop. Push the reset button to cancel the flashing LED lights. Repeat this process for the 60% deep pit.
- 12.) The handle has a special “rocking handle” attached to the bottom side of the drive motor module. This handle is used to lift the drive wheels and rock the scanner back and forth over the defective area to resolve the location of the pit. Take note of the channel number or numbers that have discreet signals on the LED display while rocking the scanner.
- 13.) The location of the pit is obtained by rocking the unit back and forth in smaller sweeps until the sensor is directly over the pit. The floor is marked on the side of the scanner at the location of the sensor bar. The location label on the front of the scanner is used to mark the channel number or numbers that represents discreet signals that were observed during the rocking process. Connect the two marks to provide the center of the resolution area for ultrasonic prove-up.

**IMPORTANT NOTE: The MFE 2412 Mark II Stop On Defect Scanner utilizes the magnetic flux leakage technique. The Stop On Defect Scanner has a stop on defect function that is used to provide an auto stop feature to help insure that the technician does not miss defects due to distraction from the display screen. The unit provides the stop on defect function by setting a gate on the screen. Any signal that is generated higher than the gate will cause the unit to stop. It must be noted that the signal amplitude does not necessarily correlate to the pit depth. The signal amplitude is more a function of the total volume loss and includes length, width, and depth. Therefore signal amplitude alone should not be used as an accept/reject criterion. Any discreet signal that is seen on the screen can be evaluated ultrasonically.**

## Scanning

The scanning speed is a function of the drive motor speed and is controlled via the drive control motor % function button. Push up to increase speed and down to decrease speed. Faster speeds will result in higher amplitude signals. Slower speeds will result in lower amplitude signals. If the speed is slower than a walking pace it is suggested that the gain be increased to compensate. Set ups will always be affected by the combination of speed and gain.

Maximum coverage of the floor area is achieved with overlapping scans on a plate by plate basis. Do not attempt to pull, push, or drive the scanner over lap welds as damage could occur.

Tank floors will generate a level of noise based on variables such as top surface condition of the plate. This noise will be evident on the LED display and will be seen as a level of signal across the full width of the screen. The level of noise generated will determine the level of sensitivity that can be achieved on the particular tank floor.

As soon as discreet signals are noticed they must be proved up with ultrasonic equipment. The ultrasonic data will provide information to the technician as regards the system sensitivity such that the technician can adjust the system sensitivity for the continuation of scanning. The channels are numbered from left to right 1 through 12 and correspond to a twelve inch scan width. A defect location procedure is outlined in number 12 of the Set Up in this section.

## SECTION 5

### MFE 2412 Mark II Stop-On-Defect Scanner Maintenance

\*\*\*\* CAUTION \*\*\*\*

**This equipment incorporates proprietary information and trade secrets and is the subject of a "Restricted use, Nondisclosure and Non circumvention agreement signed by each purchaser of this equipment. In order not to breach this agreement please take note of the following restrictions:**

**DO NOT REMOVE THE STAINLESS STEEL COVER PLATES ON THE BRIDGE POLE PIECES.**

**DO NOT ATTEMPT TO OPEN THE ELECTRONICS MODULE.**

**DO NOT ATTEMPT TO DISMANTLE THE SENSOR BAR other than for the removal and replacement of the sensor protector.**

**In addition to potentially breaching the agreement, these actions will also invalidate any warranty for the scanner. Should any of these items require attention, they must be returned to the manufacturer for service.**

The scanner has been designed to be as maintenance free as possible and is extremely ruggedly constructed. The inspection environment is often extremely dirty and dusty and therefore the bulk of the maintenance required involves cleaning and removal of magnetic debris and product residue.

**DO NOT SPRAY WATER OR DETERGENT ON ANY PART OF THE SCANNER WHILE IT IS FULLY ASSEMBLED.**

The scanner can easily be dismantled with the use of the hand tools provided and the individual parts cleaned. The magnetic bridge, handle assembly, and sensor bar can be cleaned using a degreaser and absorbent cloths.

**The battery modules, electronics module, motor drive module, and motor controller can be cleaned with a dry rag only. No liquids of any kind should be used to clean these modules.**

**IT IS RECOMMENDED THAT ALL MAINTENANCE AND CLEANING OPERATIONS CARRIED OUT ON THE BRIDGE BE CONDUCTED ON A WOODEN OR NON MAGNETIC SURFACE FOR SAFETY REASONS**

- A. As required during scanning**
1. Remove build up of ferritic debris from the underside of the scanner.
  2. Check condition of Bridge and Sensor protection plates.
- B. Daily**
1. Run system function test.
  2. Check tightness of all fasteners.
  3. Check condition of wheels. (Any unevenness will result in vibration and increased noise levels)
- C. Weekly**
1. Separate the component parts of the scanner for a thorough cleaning of the magnetic bridge and sensor bar.
  2. Check the sensor bar for any debris buildup under the sensor protector cover. If necessary, remove the sensor protector cover and remove any debris buildup. If the sensor protector cover is compromised, replace it with the spare included with the scanner. The sensor protector cover is considered to be compromised if there is any hole or scratch that goes completely through the cover. Clean and dry the sensor bar.
  3. The wheel bolt threads for the magnetic bridge and the sensor protector retaining screws should be lubricated with an anti-seize compound periodically to ease removal.

## SECTION 6

### Ultrasonic Prove Up

**Magnetic Flux Leakage is an excellent detector of under floor corrosion but can give no truly accurate assessment of remaining wall thicknesses due to the limitations imposed by the inspection environment. Accurate quantitative assessment is obtained using Ultrasonic prove up.**

**It is important that the operator who carries out this assessment is adequately trained and experienced in this type of indication analysis. This is not just " thickness measurement." In order to arrive at accurate remaining wall thickness it is necessary for the operator to use equipment which is capable of giving him the information that he needs as well as the application of the correct technique. The following type of prove up equipment and technique is strongly recommended:**

- A. It is essential that a good quality A-scan display is used for the assessment of any corrosion detected. The equipment must be capable of determining location, size and the accurate quantification of remaining wall thickness.**
- B. A good quality 5 Megahertz twin crystal focused contact transducer of either 0.375" or 0.500" diameter.**
- C. Surprisingly enough ordinary water (and plenty of it) provides the best coupling media in most cases.**
- D. The amplitude of the signal from the corroded back wall must be raised to at least the same screen height as the calibration reflector.**
- E. Elevated gates tied to a digital read out are not recommended as this technique invariably underestimates the severity of the indication.**
- F. The nearest facet of the reflection must be identified and the true remaining wall thickness read from the timebase.**

## SECTION 7

### Battery Management

The batteries provided with the units are polymer lithium ion modules. **They should only be charged using the supplied 1.5-amp battery chargers which are fully automatic and will maintain the battery at full charge if left connected and turned on for extended periods without damage to either battery or charger.** If the charger is turned off for any reason the battery must be disconnected from the charger.

The fully automatic maintenance charger provided with the scanner is the only charger that should be used on this equipment. Charging of the battery can be achieved by plugging the connector plug from the charger into the mating receptacle on top of the Battery Module.

**Under no circumstances may the charger be rigged so that the unit is powered up during the charging process. This will cause severe damage to the electronics module.**

It is recommended that the battery be charged overnight, every night when the unit is in continuous use and continuously when not in use. This will ensure an adequate maintenance of battery power so that the unit will be ready for use at a moments notice.

**If it is necessary to remove or replace the battery at any time, send the entire battery module (do not remove the battery from its container) to MFE Enterprises, Inc. for repairs and/or replacement.**

## **\*\*\*\*\* Safety Notice \*\*\*\*\***

**This equipment makes use of very powerful rare earth magnets. When disassembling the unit or moving the magnetic carriage great care should be exercised to prevent damage to either the operator or equipment. Maintenance work should always be carried out on a wooden as opposed to metal bench. All tools should be kept well away from the magnetic bridge until required.**

**\*\*\*\*\* Safety Notice \*\*\*\*\***

## SECTION 8

### Scanner Adjustments

#### Standard setup

The majority of tank floors are constructed of uncoated plates in the order of 0.250 inches in thickness. The MFE 2412 Mark II Stop-On-Defect Scanner as supplied from the manufacturer is set up to function on this configuration of tank floor. No additional set up is required other than the adjustment of the sensor bar as outlined in Section 4. The intention is to run the sensor bar as close to the inspection surface as possible without actually contacting the plate. A sensor bar rubbing along the surface will generate a level of unnecessary noise. **CAUTION! Raising the sensor bar too high from the inspection surface will result in a significant reduction in sensitivity.**

The wheels fitted for the standard setup are **BLUE** in color.

#### Non -Standard Setup

It will be noticed that the wheels supplied with the scanner are color-coded and different diameters. This allows the user to configure the scanner for various plate and coating thicknesses.

**THE TABLE ON THE FOLLOWING PAGE MUST BE USED AS A GUIDE ONLY. ALL SETUPS MUST BE PROVED ON THE BASIS OF ACTUAL SIMULATION OF CONFIGURATION THICKNESSES**

<u>Wheel Color</u>	<u>Diameter</u>	<u>Plate Configuration</u>
BLUE	4.10"	0.250" uncoated 0.250" and thin film Coatings
GREEN	3.90"	0.250" coatings 10 - 80 mils thick 0.325" and thin film coatings
YELLOW	3.70"	0.325" coatings 10 - 80 mils thick 0.375" and thin film coatings
RED	3.50"	0.250" coatings over 200 mils thick 0.375" coatings 10 - 80 mils thick 0.500" and thin film coatings

When setting up the equipment for a non standard configuration it is necessary to establish the minimum size of defect to be detected. Only use the smallest wheel size necessary to achieve the required detection capability. This will ensure that neither the equipment nor the operator will be unnecessarily stressed. The closer the bridge is to the surface, the greater the rolling resistance of the scanner and the more effort required to maneuver it around the tank floor.

## SECTION 9

### RESTRICTED USE, NON-DISCLOSURE AND NON-CIRCUMVENTION AGREEMENT

This agreement is made and entered into this the \_\_\_ day of \_\_\_\_\_ in the year , by and between MFE Enterprises, Incorporated ("MFE") a corporation duly organized and existing under the laws of the State of Texas and \_\_\_\_\_ (the purchaser) for the purposes set forth herein:

#### RECITALS

- A. MFE desires to sell, and purchaser wishes to purchase certain tank floor scanning equipment, which MFE has developed and manufactured, and which specifically includes the following items:  
**MFE 2412 Mark II Tank Floor Scanner**  

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(hereinafter referred to as the "Scanners").
- B. Purchaser recognizes and acknowledges that MFE has invested substantial and valuable resources in developing the Scanners and in the technology incorporated in the development, manufacturing and operation of the Scanners (the "MFE Proprietary Information"), and that the MFE Proprietary Information is secret, confidential, and proprietary to MFE.
- C. Purchaser recognizes and acknowledges that MFE's sale of the Scanners does not include the right to reproduction of the Scanners or their component parts.
- D. MFE desires to maintain the confidentiality of the MFE Proprietary Information. Purchaser recognizes and acknowledges that the unauthorized use of the Scanners or disclosure of the MFE Proprietary Information to any person or entity except MFE and its duly authorized representatives would be detrimental and damaging to MFE.
- E. Both MFE and Purchaser (collectively "the parties") represent that they are not aware of any express or implied obligation to any third parties that conflicts with any of the obligations of this Agreement.

**NOW THEREFORE, in consideration of the mutual promises, covenants and conditions contained herein, the Parties agree as follows:**

- 1. All Scanners, the components thereof, the technology incorporated therein, and the MFE Proprietary Information shall be treated as confidential and proprietary to MFE by the Purchaser, and are subject to the terms of this agreement. Purchaser must not copy, replicate, reproduce or modify for the purpose of copying, the Scanners or the component parts thereof. Purchaser will not manufacture or produce equipment similar to the Scanners based on the MFE Proprietary Information.**
- 2. Purchaser must not (a) modify or translate the MFE Proprietary Information; (b) reverse engineer, decompile, or disassemble the Scanners (for other than routine maintenance and cleaning); (c) create derivative works based on the MFE Proprietary Information; (d) merge the MFE Proprietary Information with another product; (e) export or use the data compilations, structures, or algorithms constituting the MFE Proprietary Information with another product; (f) remove or obscure any proprietary rights, notices, or labels on the Scanners, or (g) charge a fee or royalty, or request donations, for any of the distribution or transmission of the MFE Proprietary Information.**
- 3. Purchaser is the sole party authorized to use and operate the Scanners. Purchaser will not use the Scanners in a manner inconsistent with the purpose intended for the Scanners in the inspection of tanks. To this end, neither Purchaser nor any of its employees, agents, contractors, or other persons or organizations over which purchaser has control, will rent, sell, assign, transfer, or relinquish possession of the Scanners or any component thereof, to any person or organization, without the express written consent of MFE.**
- 4. Neither Purchaser nor any of its employees, agents, contractors or other persons or organizations over which the Purchaser has control, will at any time publish, release or disclose any MFE Proprietary Information to any person or organization, without the express written consent of MFE.**

- 5. Purchaser will undertake all necessary, reasonable and appropriate steps to protect and maintain the confidentiality of all MFE Proprietary Information related to the Scanners and the components thereof. These steps include but are not limited to the following:**

  - a) Preventing the resale or transfer of the Scanners to a third party without the express written consent of MFE.**
  - b) Advising all Purchaser's employees and representatives with access to the Scanners, of this Agreement and the obligation to protect the MFE Proprietary information from disclosure;**
  - c) Requiring persons who have access to the Scanners to take all necessary, reasonable, and appropriate steps to protect the confidentiality of all MFE Proprietary Information.**
  - d) Limiting the use of the Scanners to those purposes for which the Scanners are intended;**
  - e) Prohibiting, preventing and refraining from the disassembly, decompilation, break down, or attempts to perform reverse engineering on the Scanners or of any components thereof; and**
  - f) Copying, replicating or modifying the Scanners for purpose of copying the Scanners.**
- 6.) The parties recognize and acknowledge that Purchaser's use of the Scanners or disclosure of the MFE Proprietary Information in a manner inconsistent with the terms of this Agreement may cause MFE irreparable harm for which legal remedies may be inadequate. Purchaser agrees that MFE shall have the right to injunctive or other equitable relief from a court of competent jurisdiction as may be necessary and appropriate to prevent unauthorized use or reproduction of the Scanners, or use, publication, or disclosure of MFE's Proprietary Information, by the Purchaser, its employees or agents. As such, Purchaser shall not oppose such injunction on the grounds that an adequate remedy is available at law. Such remedy shall be in addition to other remedies available to MFE.**
- 7.) Nothing contained in this Agreement, or the Terms and Conditions set forth on the corresponding invoice shall be construed as granting or conferring to Purchaser any rights in MFE's Proprietary Information or in the technology MFE incorporated in the development, manufacturing and operation of the Scanners.**
- 8.) This agreement constitutes the entire agreement between the Parties, their affiliates and subsidiaries and supersedes any prior or contemporaneous oral or written representations with regard to the subject matter thereof. This Agreement may not be modified except in writing signed by both Parties.**

- 9.) **Defined terms have the meaning ascribed to them through out this Agreement, whether capitalized or lower case. Where the context requires, singular and plural terms include the other.**
- 10.) **This Agreement shall be construed and governed in all respects in accordance with the laws of Texas. This Agreement is performable in Harris County, Texas, and unless the parties agree otherwise in writing, venue for the resolution of any dispute regarding this Agreement or enforcement of rights relating to this Agreement shall be proper only in Harris County, Texas. Any legal proceedings to enforce or interpret the provisions of this Agreement must be brought exclusively in the District Court of Harris County, Texas or in the United States District Court for the Southern District of Texas.**
- 11.) **In the event that any provision of this Agreement is determined by a court of competent jurisdiction to be void or unenforceable, then all remaining paragraphs and provisions shall remain in full force and effect, as if the invalid provision was originally deleted from the Agreement.**
- 12.) **In the event of a breach of this Agreement, or in the event that such breach appears to be imminent, the non faulting party shall be entitled to all legal and equitable remedies afforded by law as a result thereof. MFE shall, in addition to any and all other forms of legal and equitable relief, recover from the other party all reasonable costs and attorney's fees incurred in seeking any such remedy.**
- 13.) **This Non-Disclosure Agreement may be executed in facsimile copies, which shall serve as original.**

**IN WITNESS WHEREOF the parties have executed this Non-Disclosure Non-Circumvention Agreement on the date indicated below: Signatures represent agreement to 4 pages including signature page.**

**MFE Enterprises, Inc.**

**By: William B. Duke**  
**19419 Pinehurst Trail Drive**  
**Humble, Texas 77346**

**By: Purchaser -**

**Date:**