

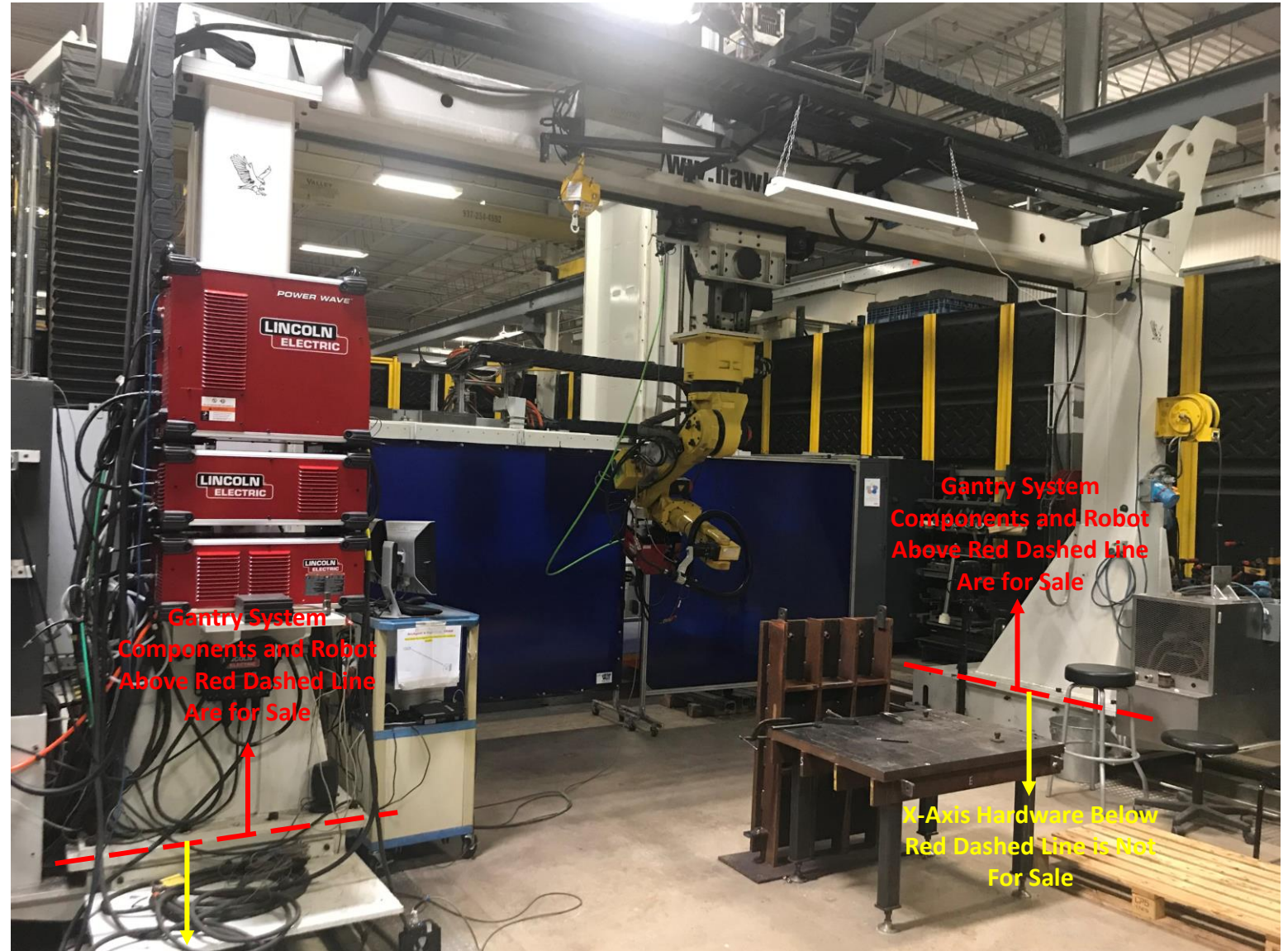
# 2004 Fanuc Robotic Gantry System



# System Description

- Robotic gantry-based system was purchased in 2004 from Hawk Technologies
- Gantry system cost was \$671k which included items listed in the following slides
- What is for sale
  - Fanuc robot and controller
  - Gantry with Y-axis and Z-axis
- What is not for sale
  - All welding equipment shown in the photos is not for sale
  - X-axis (rail axis) hardware in the two white boxes that are below the gantry legs is not for sale

- All welding equipment is not included in the sale
- X-axis hardware in the white boxes that are below the gantry legs is not for sale



X-Axis Hardware Below Red Dashed Line is Not For Sale

# System Specs

## Reconfigurable Manufacturing Cell

RFQ G

### GANTRY SYSTEM

THREE AXIS GANTRY SYSTEM WITH ROBOT MOUNT

- \* X AXIS TRAVEL 20 FEET
- \* Y AXIS TRAVEL 15 FEET
- \* Z AXIS ANGLE PLATE FOR ROBOT MOUNTING - FOR Z AXIS OPTION AUTOMATION, SEE "FOUR ALPHA 12I MOTOR PACKAGE WITH Z AXIS EQUIPMENT
- \* ROBOT BASE WILL BE 48 INCHES FROM FLOOR IN THE LOWEST POSITION
- \* ROBOT CONTROLLER, WELDING POWER SUPPLY, WIRE DRUM, AND ALL RELATED EQUIPMENT WILL TRAVEL WITH THE GANTRY COLUMNS
- \* POWER WILL BE FED FROM OVERHEAD
- \* ACCURACY OF GANTRY SYSTEM NOT TO EXCEED +/- 0.003 INCHES WITHIN A 12.00 INCH CUBE TAKEN WITHIN A NOT TO EXCEED 10 MINUTE CYCLE

### GANTRY RAIL SYSTEM

(2) 12' GANTRY RAIL SYSTEM TO MATCH EXISTING SYSTEM FOOTPRINT

### ROBOT, AM120IB, R-J3IB, ARCLINK/DNET

ARCIMATE 120IB, 6 AXIS ARM, DIRECT MOTION N ABSOLUTE ENCODER DRIVE, 20KG PAYLOAD, V6.X OPERATING SOFTWARE WITH SIX AXIS BRAKES (ALL AXES). 1,667MM (65.8") REACH FROM CENTERLINE AXIS 1 TO CENTERLINE OF AXIS 5. R-J3IB CONTROLLER FEATURING:

- \* DETACHED CONTROLLER CABINET WITH 7 METER NON TRACK-RATED CABLES (LONGER CABLES AND TRACK-RATED CABLES AVAILABLE)
- \* TEACH PENDANT WITH 10 METER CONTROL CABLE
- \* 6.4" COLOR TFT BACKLIT LCD DISPLAY - LARGE 640 X 480 DISPLAY WITH 256 COLORS
- \* INTUITIVE MULTI WINDOW DISPLAY AND FLY-OUT MENU BARS
- \* BUILT-IN CAUSE/REMEDY INFORMATION AVAILABLE FOR EVERY ROBOT ALARM USING DIAGNOSTIC BUTTON
- \* RIGHT HAND/LEFT HAND INTERCHANGEABLE STRAP
- \* OPTIONAL INTERNET-ENABLED EMBEDDED WEB BROWSER
- \* MAIN CPU BOARD
- \* 16 MB DRAM MEMORY / 16 MB FROM MEMORY / 2 MB SRAM MEMORY
- \* ALL DIGITAL WELD PROCESS I/O BOARD AND CONTROLS
- \* ARCTOOL WELDING APPLICATION SOFTWARE, V6.X
- \* MULTI-TASKING UTILITY
- \* WEAVE INSTRUCTIONS
- \* PROGRAM SHIFT UTILITY
- \* MIRROR IMAGE UTILITY
- \* MACRO PROGRAMMING FUNCTIONALITY
- \* 440-575 VOLT/3 PHASE/60 HERTZ INPUT POWER SUPPLY REQUIRED
- \* STANDARD COMPACT DISC ARC WELDING DOCUMENTATION AND MANUALS
- \* BUILT-IN DEVICENET HARDWARE FOR INTEGRATION OF WELDING UNIT
- \* BUILT-IN PCMCIA CARD SLOT ON ROBOT CONTROLLER
- \* MULTIPLE PROGRAMMING/OPERATION SPEED SELECTION SWITCH
- \* ANSI/RIA 15.06-1999 COMPLIANT MECHANICAL UNIT AND ROBOT CONTROLLER

REF SECTIONS:

SECTION 7

SECTION 13.1.2 THROUGH 13.1.20

SECTION 14.1 ACCURACY IS A FUNCTION OF THE PROGRAMMING (SEE THE NON-COMPLIANCE SECTION).

SECTION 14.2 (AM120IB HAS A .06mm REPEATABILITY =.0031")

SECTION 14.3 ACCURACY IS A FUNCTION OF THE PROGRAMMING (SEE THE NON COMPLIANCE SECTION). PATH REPEATABILITY INFORMATION IS NOT PUBLISHED BY THE ROBOT MANUFACTURER AND THEREFORE CANNOT BE VERIFIED BY THE SELLER.

# System Specs

## **GMAW PKG,PW455M/STT,PF-10R2,NO CABLES**

POWERWAVE 455M/STT WELDING POWER SUPPLY PACKAGE, FOR R-J3IB CABINET. THIS PACKAGE INCLUDES THE FOLLOWING:

- \* POWERWAVE 455M WELDING UNIT, WITH 450 AMP OUTPUT @ 100% DUTY CYCLE
- \* PATENTED STT (SURFACE TENSION TRANSFER) WELDING TECHNOLOGY
- \* TWO WELDING OUTPUT STUDS (STT STUD IS LIMITED TO 325 AMPS OUTPUT)
- \* POWERFEED 10R WIRE DRIVE UNIT WITH 4 POWERED DRIVE ROLLS AND 50-800/75-1200 IPM WIRE FEED RANGE (TWO SPEED RANGES AVAILABLE ON THE SAME UNIT)
- \* SUPPLY HAS ONLY A POWER (ON/OFF) SWITCH. ALL OPERATOR INTERFACING IS PERFORMED THROUGH THE ROBOTIC TEACH PENDANT. THE CABLES ARE QUOTED SEPARATELY TO ALLOW FOR A CUSTOM CABLE LENGTH PACKAGE. (SEE THE NEXT ITEM) NOTE: FOR SYSTEM FUNCTIONALITY (SECTION 8.2) OF THE POWERWAVE 455M/STT THE ROBOT MUST BE CAPABLE OF EITHER ARCLINK OR DEVICENET COMMUNICATION. ARCLINK IS THE PREFERRED PROTOCOL BY LINCOLN ELECTRIC AS THE COMMUNICATION SPEEDS ARE FASTER. FANUC ROBOTICS IS THE ONLY ROBOTIC SUPPLIER WITH THIS CAPABILITY. SOME OTHER ROBOTIC SUPPLIERS HAVE DEVELOPED DEVICENET CAPABILITY FOR THE PW455M/STT.

## **CABLE SET FOR THE GMAW PACKAGE**

- \* 50FT CABLES FROM THE PW455M/STT TO THE FEEDER
- \* 16 FOOT DIGITAL COMMUNICATION CABLE FROM THE CONTROLLER TO THE PW455M/STT
- \* 75FT GROUND CABLE AND PROCESS SENSE LEAD.

## **TORCH PKG TREG AC/QC 500A 10' 035 22D LG**

- \* TREGASKISS AIR COOLED 500 AMP TORCH PACKAGE WITH A TOUGH GUN CLUTCH COLLISION SENSOR, AN OFFSET TORCH MOUNTING ARM, AND A LONG REACH, QUICK CHANGE 22 DEGREE TORCH NECK ASSEMBLY. (500AMPS 100% DUTY CYCLE WITH CO2 GAS) REF: SECTION 8.4

## **DRIVE ROLL KIT (035 STL,4 ROLL)**

- \* ONE SET OF .035 DIAMETER DRIVE ROLLS AND GUIDES. OTHER SIZES OF DRIVE ROLLS AVAILABLE AT THE APPROXIMATE PRICE OF \$40 TO \$50 EACH. THE TORCH CONDUIT AND CONTACT TIPS MAY ALSO NEED TO BE CHANGED AT A NOMINAL COST.

## **FTP SETUP**

- \* ALLOWS FOR FTP COMMUNICATION VIA THE STANDARD 100BASET ETHERNET CONNECTION IN THE ROBOT CONTROLLER. FANUC ROBOTICS OFFERS NUMEROUS NETWORKING PRODUCTS. SEE THE ATTACHED INFORMATION. IF ADDITIONAL PRODUCTS ARE REQUIRED PLEASE REQUEST A QUOTE. REF SECTION 16.4

## **SAFETY & FENCING ENCLOSURE**

- \* FENCING ENCLOSURE COMPOSED OF INDIVIDUAL FRAMES OF VARYING WIDTH THAT CAN BE BOLTED TOGETHER EITHER STRAIGHT OR AT 90 DEGREE ANGLES. TWO DOORS WILL BE INCLUDED WITH KEY SAFETY INTERLOCK SWITCHES. EACH FRAME TO INCLUDE WIRE MESH AND ORANGE TRANSPARENT ARC FLASH SCREENS. TYPICALLY THIS FENCING IS LAGGED TO THE FLOOR. TO OPEN EITHER ACCESS DOOR A KEY WILL NEED TO BE REMOVED FROM ITS MONITORED STORAGE LOCATION AND USED TO UNLOCK THE DOOR. THIS WILL PREVENT OPERATION OF THE ROBOT OR ITS GANTRY IN AUTOMATIC MODE WHILE SOMEONE IS IN THE SYSTEM. TWO ADDITIONAL SAFETY RELAYS WILL BE INCLUDED FOR CUSTOMER USE. SECTION 12.2, 12.3 AND 16.6

## **ON-SITE INSTALLATION ASSISTANCE**

- \* FIVE (5) 8 HOUR WEEKDAYS OF ON-SITE INSTALLATION ASSISTANCE BY A LINCOLN AUTOMATION ENGINEER. TRAVEL AND LIVING EXPENSES ARE NOT INCLUDED. THESE COSTS WILL BE BILLED TO THE CUSTOMER FOLLOWING THE SERVICE. SEE THE TERMS AND CONDITIONS SECTION OF THIS QUOTE FOR INFORMATION ON ADDITIONAL DAYS, OVERTIME AND WEEKEND RATES.

## **TOTAL ROBOTIC SYSTEM PRICE:**

**Total Sub-System**

# System Specs

## **Recommended Options - Package One:**

### **SFTW, ARC DATA MONITORING, RJ3B, PAC**

- ARC DATA MONITOR SOFTWARE ALLOWS THE ROBOT TO SAMPLE WELDING DATA WHILE IN OPERATION, TO TRACK USER DEFINED PARAMETERS. THE ROBOT CAN EITHER SIGNAL A WARNING OR DISABLE THE WELDING PROCESS IF THE PARAMETERS EXCEED THE OPERATING LIMITS DEFINED BY THE OPERATOR. UP TO FOUR SIGNALS CAN BE MONITORED
- VOLTAGE AND AMPERAGE REQUIRE NO SPECIAL EXTERNAL DEVICES. ACTUAL WIRE FEED SPEED AND GAS FLOW RATE ARE EXAMPLES THAT THAT WOULD REQUIRE EXTERNAL SENSORS. A WIRE FEED SPEED TACHOMETER IS QUOTED BELOW AS AN OPTION. REF SECTION 13.1.1

### **FOUR ALPHA 12i MOTOR PACKAGE WITH Z AXIS EQUIPMENT**

#### **PACKAGE INCLUDES:**

- FOUR ALPHA 12i MOTORS
- 3KW EACH
- 3000RPM
- STRAIGHT SHAFTS - NO KEYWAYS
- 14M HIGH FLEX (TRACK RATED) CABLES
- CONFIGURED WITH THE ROBOT AS AN INTEGRAL RAIL
- TWO MOTORS (IN THE TOWERS) TO BE SYNCHRONIZED AND CONTROLLED TOGETHER.
- ROBOT INTERNAL TRANSFORMER UPGRADE FROM 3KW TO 7.5KW REF SECTION 16.1, 16.2 AND 19.9
- Z AXIS EQUIPMENT TO ACCOMMODATE 4 FEET TRAVEL
- INSTALLATION TO BE COMPLETED BY THE BUYER

### **PC BD,DNET PROJAL,RJ3I/RJ3B,DUAL CHANNEL**

- ADDITIONAL TWO CHANNEL DIGITAL COMMUNICATION BOARD. ONE CHANNEL TO BE ARCLINK FOR COMMUNICATION WITH THE PW455M/STT. THE OTHER CHANNEL TO BE DEVICENET FOR COMMUNICATION WITH A HYBRID YAG LASER WITH DEVICENET COMMUNICATION. THIS IS IN ADDITION TO THE STANDARD SINGLE CHANNEL DIGITAL COMMUNICATION CARD. THIS CONFIGURATION WILL BE ABLE TO SUPPORT TWO PW455M/STT POWERSOURCES (EITHER TANDEM OR SEPARATE ARCS) AND ONE HYBRID YAG LASER WITH DEVICENET COMMUNICATION. NOTE: SECOND PW455M/STT SYSTEM AND TANDEM MIG SOFTWARE NOT INCLUDED. THIS DOES NOT INCLUDE THE HYBRID YAG LASER. THIS ITEM DOES NOT INCLUDE THE I/O SEQUENCING ORDER/PROGRAMMING OF THE YAG LASER. REF SECTION 8.5, 8.8

### **ENCLOSURE - ANALOG AND DIGITAL COMM.**

- THIS ITEM ADDS AN ANALOG PROCESS I/O BOARD TO THE SYSTEM IN ADDITION TO THE STANDARD PROCESS I/O BOARD WITH DIGITAL I/O ONLY. THIS WILL PROVIDE 2 ANALOG INPUTS, 2 ANALOG OUTPUTS AND A TOTAL OF 30+ DIGITAL I/O. 20 OF THE DIGITAL I/O WILL BE WIRED TO A TERMINAL STRIP WITH INDICATOR LIGHTS FOR TROUBLE SHOOTING PURPOSES. THIS INCLUDES A 7M PROCESS I/O CONNECTION CABLE FROM THE BOARD TO THE ANALOG POWERSOURCE. THE CONNECTION IS A 37 PIN AMPHENOL - FANUC STANDARD. ONE 115V -15AMP DUPLEX RECEPTICAL WILL BE PROVIDED. APPLICABLE SECTIONS SECTION 8.8: DESIGN CONSIDERATIONS TOWARD MULTIPLE POWERSOURCES. SECTION 16.5: DIGITAL I/O AVAILABILITY AND ANALOG OUTPUT CAPABILITY. NOTE: THE DIGITAL I/O ARE NOT CAPABLE OF BEING CONVERTED TO ANALOG. SECTION 19.10 - 115V DUPLEX RECEPTICAL

### **SFTW,MULTI-EQUIPMENT,RJ3B,PAC**

- SUPPORTS THE INTEGRATION OF TWO DIFFERENT POWERSOURCES AT THE SAME TIME BY STORING SET-UP VARIABLES FOR EACH. THIS PROVIDES FOR MORE SEAMLESS CHANGE-OVER BETWEEN THE TWO POWERSOURCES.

### **ON-SITE TRAINING FOR 5 PEOPLE**

- ON SITE TRAINING FOR 5 PEOPLE AT EWI ON ROBOT PROGRAMMING BY A LINCOLN AUTOMATION TRAINER. (FIVE 8 HOUR DAYS EXPECTED) TRAVEL AND LIVING EXPENSES ARE INCLUDED.

### **ON-SITE MAINTENANCE TRAINING**

- ON SITE MAINTENANCE TRAINING FOR 3 PEOPLE AT EWI ON ROBOT PROGRAMMING BY A LINCOLN AUTOMATION TRAINER. (TWO 8 HOUR DAYS EXPECTED) TRAVEL AND LIVING EXPENSES ARE INCLUDED.

# System Specs

## Recommended Options - Package Two:

### EXTERNAL WFS TACH KIT WITH ENCODER

- \* EXTERNAL TACHOMETER TO FEED A 0 TO 10V SIGNAL TO THE ARC DATA MONITORING SOFTWARE. THIS WOULD BE REQUIRED TO INDEPENDENTLY MONITOR ACTUAL WIRE FEED SPEED. REF SECTION 13.1.1

### WAVE DESIGNER SOFTWARE KIT

#### SFTW, TAST W/ MP/RPM, RJ3B, PAC

- \* THROUGH ARC SEAM TRACKING WITH MULTI-PASS AND ROOT PASS MEMORIZATION CAPABILITIES. TAST IS A SEAM TRACKING METHOD THAT USES WELDING CURRENT FEEDBACK TO KEEP THE TORCH POSITIONED CORRECTLY IN THE JOINT. TAST CORRECTS THE ROBOT'S PATH IN BOTH THE LATERAL AND VERTICAL DIRECTIONS WHILE WELDING USING A WEAVE.

### SFTW, HI-SPEED TOUCH SENSING W/CLIPPER

- \* SOFTWARE DESIGNED TO IDENTIFY PART LOCATION BY A SERIES OF HIGH SPEED WELDING WIRE TOUCH ROUTINES. WIRE TIP SEARCHES IN USER DEFINED DIRECTIONS UNTIL IT CONTACTS THE WELDPiece, SAVING THE LOCATION INTO MEMORY. ALL OR PART OF THE WELDING PROGRAM CAN BE SHIFTED BY THE OFFSET MEASURED BY THE WELDING WIRE. A PNEUMATIC WIRE CLIPPER IS INCLUDED WITH THIS OPTION, TO ENSURE A 'CLEAN' WIRE TIP. WIRE CLIPPER REQUIRES L10359-X MOUNTING STAND (SOLD SEPARATELY), IF STAND ALONE MOUNTING IS DESIRED.

### INTEGRATION - VISION SYSTEM FOR TRACKING To be determined

- \* INTEGRATION OF AN EWI SUPPLIED SERVO ROBOT SYSTEM INCLUDES:
  - \* BRACKETRY TO MOUNT THE CAMERA TO THE ROBOT ARM.
  - \* FANUC SOFTWARE TO SUPPORT VISION BASED SEAM TRACKING.
  - \* TESTING OF THE EQUIPMENT TO CONFIRM PROPER FUNCTIONING BETWEEN THE CAMERA AND ROBOT ON BASIC FILLET JOINTS.
- NOTES:
  - \* THIS DOES NOT INCLUDE ADAPTIVE FILL CAPABILITIES SEE THAT OPTION BELOW.
  - \* IF A DIFFERENT BRAND OF CAMERA IS TO BE USED, LINCOLN AUTOMATION IS TO BE NOTIFIED. PRICING MAY VARY. REF: SECTION 11.3

### ADAPTIVE FILL - SOFTWARE BASED

- \* THIS OPTION INCLUDES THE FUNCTIONALITY OF THE AD1172-4-FI TAST OPTION QUOTED ABOVE PLUS: THIS SOFTWARE PACKAGE ALSO FEEDS JOINT DIMENSIONAL INFORMATION BACK. THIS IS USED TO MODIFY THE WEAVE AMPLITUDE AND TRAVEL SPEED TO MAINTAIN CONSISTANT - EVEN FILL IN AN UNEVENLY SIZED JOINT. TOUCH SENSING (SOLD SEPERATELY) IS USED TO FIND THE START. AT ARC START, THE USER DEFINED WELD SCHEDULE IS MODIFIED BY JOINT WIDTH AND WEAVE AMPLITUDE BASE ON TOUCH MEASUREMENT OF JOINT WIDTH. THE FIRST FEW WEAVE CYCLES ARE USED TO CAPTURE WELD CURRENT AND VOLTAGE PROFILE WITH RESPECT TO LATERAL POSITION. THIS REPRESENTS THE TARGET PROFILE TO BE MAINTAINED FOR THE REMAINDER OF THE WELD. THE WEAVE AMPLITUDE AND TRACK POSITION ARE MODIFIED BASED ON MEASURED VALUES OVER CURRENT WEAVE HALF-CYCLES COMPARED TO TARGET. THE JOINT TRAVEL SPEED IS MODIFIED BASED ON WEAVE AMPLITUDE. THIS INFORMATION IS STORED FOR MULTIPLE PASS WELDING. NOTE: FANUC MATERIAL JOINING GROUP REQUIRES A REVIEW OF THE APPLICATION THIS IS TO BE USED ON. THIS QUOTE DOES NOT INCLUDE PROCESS DEVELOPMENT.

### ADAPTIVE FILL - VISION BASED

- \* INCLUDES THE INTEGRATION AS OUTLINED IN THE OPTION ABOVE. IN ADDITION, THIS SOFTWARE INCLUDES THE ABILITY TO VARY THE WIRE FEED SPEED, WEAVE AMPLITUDE AND TRAVEL SPEED TO MAINTAIN CONSTANT FILL IN A VARYING JOINT. THIS QUOTE DOES NOT INCLUDE PROCESS DEVELOPMENT. FANUC MATERIAL JOINING GROUP REQUIRES A REVIEW OF THE APPLICATION THE PRICING QUOTED DOES NOT INCLUDE THE LASER TRACKING EQUIPMENT. THIS IS TO BE SUPPLIED BY EWI FOR INTEGRATION BY LINCOLN ELECTRIC. A SERVO ROBOT MSPOT 90 IS ASSUMED.

### SFTW, BUMP BOX, RJ3B, PAC

- \* SOFTWARE THAT ALLOWS YOU TO OFFSET A WELD. IT IS INTENDED TO ADJUST THE PATH TO ACCOMMODATE SMALL VARIATIONS IN THE TRIM LINE RESULTING FROM VARYING LOTS/BATCHES DURING PRODUCTION. THE OFFSETS CAN BE APPLIED ON IN THE X, Y OR Z DIRECTION. THESE OFFSETS CAN BE REMOVED AT ANY TIME. THE TEACH PENDANT IS THE STANDARD INTERFACE FOR CHANGING THE AMOUNT OF OFFSET. THIS CAN BE REMOTE (AT ADDITIONAL COST) TO A REMOTE PANEL. REF SEC 13.1.15 CAN BE INTERPRETED TO REQUIRE THIS SOFTWARE.

# System Specs

|   |                           |                     |
|---|---------------------------|---------------------|
| <b>SFTW, TORCH GUARD PKG, W/ TORCHMATE III</b>  |                           | \$1,755.00          |
| * THIS BUNDLED PACKAGE OF SOFTWARE FEATURES INCLUDES: TORCHMATE (AUTOMATIC TOOL CENTER POINT RE-CALIBRATION), COLLISION GUARD AND PAYLOAD ID. THIS SOFTWARE FEATURE DOES NOT MONITOR COLLISIONS OR INTERRUPTIONS OF SERVO POSITIONING EQUIPMENT (AUX AXES). TORCHMATE ALLOWS AUTOMATIC ADJUSTMENT OF ROBOT TOOL CENTER POINT (TCP) FOR MIG PROCESSES; 10-20 SECONDS, CYCLE REDEFINES THE TCP TO HELP MAINTAIN WIRE ALIGNMENT IN THE WELD JOINT AS PROGRAMMED (DOES NOT LOCATE OR TRACK THE WELD JOINT) COLLISION GUARD SOFTWARE ALLOWS THE ROBOT USER TO ESTABLISH FUNCTIONAL LIMITS WITHIN THE ROBOT ARM THAT WILL CAUSE THE ROBOT TO FAULT IF IT SENSES A COLLISION IN ANY OF ITS AXES. THE ROBOT MONITORS FEEDBACK FROM ITS SERVO MOTORS (BASED UPON EXPECTED INERTIAS FOR INDIVIDUAL MOVEMENTS), AND FAULTS OUT IF A COLLISION CAUSES A SPIKE IN MOTOR POWER TO ATTEMPT A MOVEMENT. PAYLOAD IDENTIFICATION USES AN AUTOMATIC ROUTINE TO DETERMINE THE MASS AND CENTER OF GRAVITY OF THE ROBOT'S END EFFECTOR (TORCH PACKAGE). WITH THIS INFORMATION, THE ROBOT MODIFIES SYSTEM VARIABLES ACCORDINGLY FOR ACCELERATION AND DECELERATION, OPTIMIZING AIR MOVE SPEEDS. PAYLOAD ID IS NOT AVAILABLE WITH THE ARCMATE 50IB-3L. |                           |                     |
| * PRICING INCLUDES THE REPLACEMENT OF THE TREGASKISS COLLISION SENSOR WITH A SOLID CONNECTION ARM.  |                           |                     |
| <b>SFTW, PC FILE SERVICE, CD ROM</b>  |                           | \$3,550.00          |
| * FANUC PC FILE SERVICES SOFTWARE, FOR USE WITH WINDOWS NT PROVIDES A NETWORK SOLUTION FOR ROBOT FILE STORAGE AND MANAGEMENT. BACKUP AND RESTORE OF ALL CRITICAL FILES IN THE ROBOT CONTROLLER CAN BE ACCOMPLISHED VIA ETHERNET CONNECTION BETWEEN NETWORK PC AND ROBOT CONTROLLER.   |                           |                     |
| * CUSTOMER SCHEDULED ROBOT FILE BACKUPS   |                           |                     |
| * FILES CAN BE COPIED OR MOVED FROM ROBOT TO ROBOT OR ROBOT TO COMPUTER. COMPUTER REQUIREMENTS (COMPUTER NOT INCLUDED)  |                           |                     |
| * PENTIUM BASED IBM PC, PS2 OR 100% COMPATIBLE - WINDOWS NT 4.0 OR GREATER  |                           |                     |
| * MICROSOFT TCP/IP SOFTWARE   |                           |                     |
| * 32 MB RAM (MINIMUM)   |                           |                     |
| * CD ROM  |                           |                     |
| * 3COM 3C509 10BASE2 ETHERNET BOARD OR EQUIVALENT. ONE COPY OF PC FILE SERVICES CAN SERVICE MORE THAN ONE ROBOT ARM   |                           |                     |
| DOCUMENTATION:  |                           |                     |
| * LINCOLN AUTOMATION WILL PROVIDE DOCUMENTATION ON THE LINCOLN/FANUC COMPONENTS SOLD PER THE CUSTOMER SPECIFICATION (SECTION 17.3.1 AND 17.3.3 THROUGH 17.3.9) HYBRID LASER EQUIPMENT: EWI HAS INDICATED THAT THE TRUMPF MODEL 4006 YAG LASER IS THE MOST LIKELY UNIT TO BE USED. LINCOLN AUTOMATION HAS NOT INCLUDED THIS ITEM IN THE QUOTE. AS LINCOLN AUTOMATION CAN ADD LITTLE VALUE TO THIS PRODUCT, IT IS RECOMMENDED THAT EWI PURCHASE THIS SYSTEM DIRECTLY. A DIFFERENT LASER MAY REQUIRE DIFFERENT COMMUNICATION SOFTWARE/HARDWARE THAN IS QUOTED FOR THE TRUMPF UNIT. THE QUOTE MAY VARY SLIGHTLY FOR A DIFFERENT MODEL. LASER BASED SEAM TRACKING: EWI HAS INDICATED IN PREVIOUSLY THAT A SERVO ROBOT SYSTEM WOULD BE THE MOST LIKELY SYSTEM. LINCOLN AUTOMATION CAN PROVIDE LITTLE VALUE TO THIS PRODUCT. SO THIS SYSTEM IS NOT INCLUDED IN THE QUOTE. IT IS RECOMMENDED THAT EWI PURCHASE THIS ITEM DIRECTLY. PLEASE NOTE THAT A LASER BASED VISION SYSTEM IS INCAPABLE OF IMPROVING THE MECHANICAL REPEATABILITY OF THE ROBOT ARM.  |                           |                     |
| <b>Head and Tail Stock Face Plates - 72" Dia Face Plate</b>   |                           | \$19,482.00         |
| <b>Turn Table Face Plate - 36" Dia Face Plate</b>   |                           | \$2,825.00          |
| <b>Picture Frame for Drop Center Axis</b>   |                           | \$30,660.00         |
| <b>WeldPRO™ Software</b>  |                           | \$16,032.00         |
| * ORIGINAL PURCHASE INCLUDES 2 DAYS OF TRAINING AT LINCOLN AUTOMATION, CLEVELAND, OH (ANNUAL MAINTENANCE N/A)   |                           |                     |
| <b>WeldPRO™ Software - Option</b>   |                           | \$7,848.00          |
| * ALLOWS OPERATION OF SOFTWARE ON A PERSONAL COMPUTER WITH A FANUC TEACH PENDANT. TEACH PENDANT IS INCLUDED AND CAN BE USE AS A SPARE PENDANT FOR ROBOTIC SYSTEM  |                           |                     |
| <b>Terms</b>  | <b>See Attachment "A"</b> |                     |
| <b>Total System</b>   |                           | <b>\$670,870.35</b> |

Confidential data from