



Software Suite for CNC Metal Forming

**SpinCAD®
4.0**

CNC
Programming
Software

SetupPRO®

Machine Set
Up Utility
Screen

ZonePRO®

Teach-In /
Playback
Control

DataPRO®

Data Record
and Live
Graph Utility

Innovative

Supported

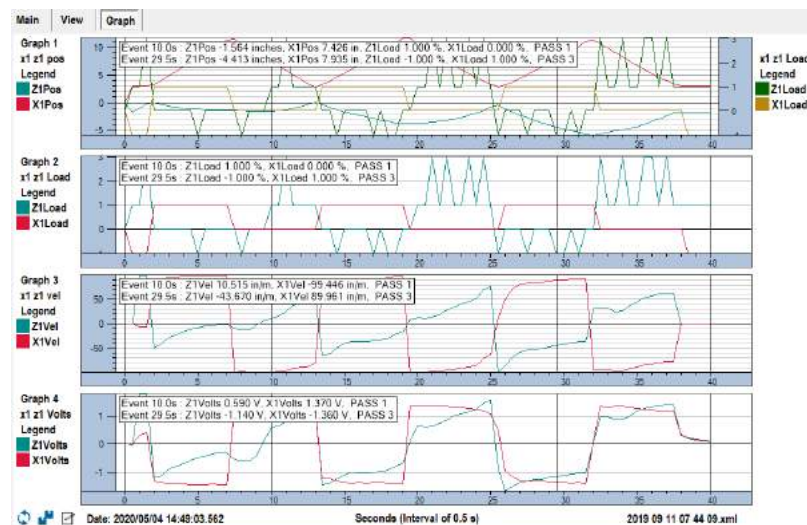
Proven

Customized

MJC's Software Suite

New Levels of CNC Metal Spinning Programming

DataPRO®



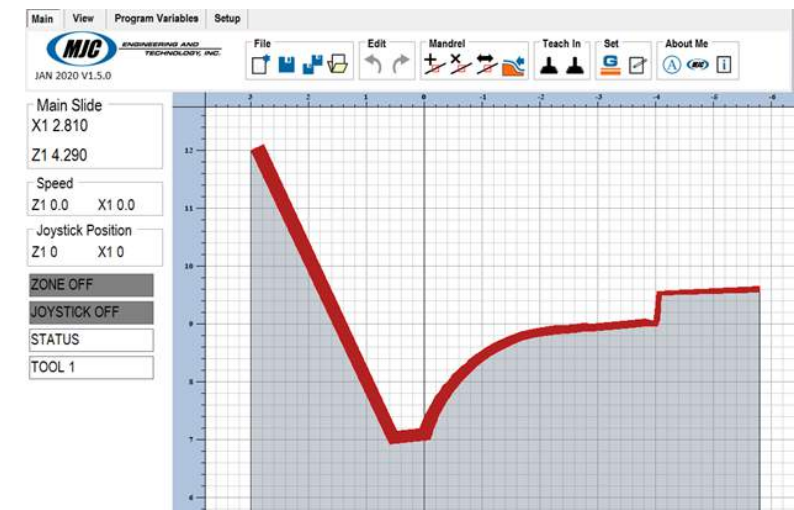
Data Collection Software

I/O Inputs & Outputs

The screenshot shows a grid of status indicators for various machine inputs and outputs. The columns are labeled 'NAME', 'ADDRESS', 'INPUT 50-57', 'INPUT 58-65', and 'OUTPUT 50-57'. The indicators include: ZERO SPEED, DRIVE OKAY, ALM READY TO START, POWER ON, SP LUBE FS, HANDWHEEL ENABLE, ALL OL OK, HPU SOFTSTART OK, WAYLUBE CONFIRM, POWER SUPPLY OK, TS FWD LS, TS BACK LS, SCANNER 1 WARNING, SCANNER 1 FAULT, SCANNER 2 WARNING, SCANNER 2 FAULT, HYD SYSTEM PRESS A OK, HYD SYSTEM PRESS B OK, HYD PRESS FILTER OK, TS PRESS SWITCH, HYD TANK LOW LEVEL, HYD TEMP HIGH, HYD RETURN FILTER OK, and HYD PRESS FILTER A OK.

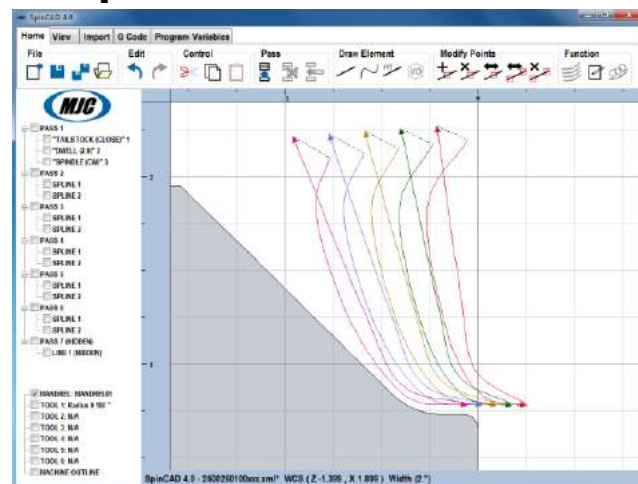
I/O Screens for trouble shooting

ZonePRO®



Teach-In/Playback Software

SpinCAD® 4.0



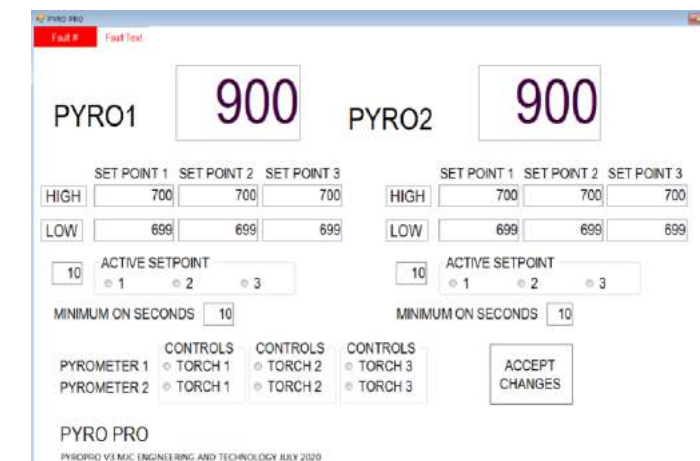
CNC Programming Software

SetupPRO®

The screenshot shows machine set-up parameters for 'TOOL 1'. The parameters are organized into columns for MCS and WCS. The parameters include: Z1 (-21.603, 10.210), X1 (-15.797, 10.110), X2 (-36.177, 10.310), X3 (-52.243, 10.410), TURRET (1), RADIUS (.000), ANGLE (00.00), Z1 OFFSET (-10.222), X1 OFFSET (-10.123), X2 OFFSET (-10.323), X3 OFFSET (-10.423), TRIM (0.001, 0.003, 0.004), CYCLE TIME (200), PART COUNT (100), and TS POSITION (18.00, 18.00). There are 'RESET' and 'ACCEPT' buttons at the bottom.

Machine Set-Up Utility

PyroPRO



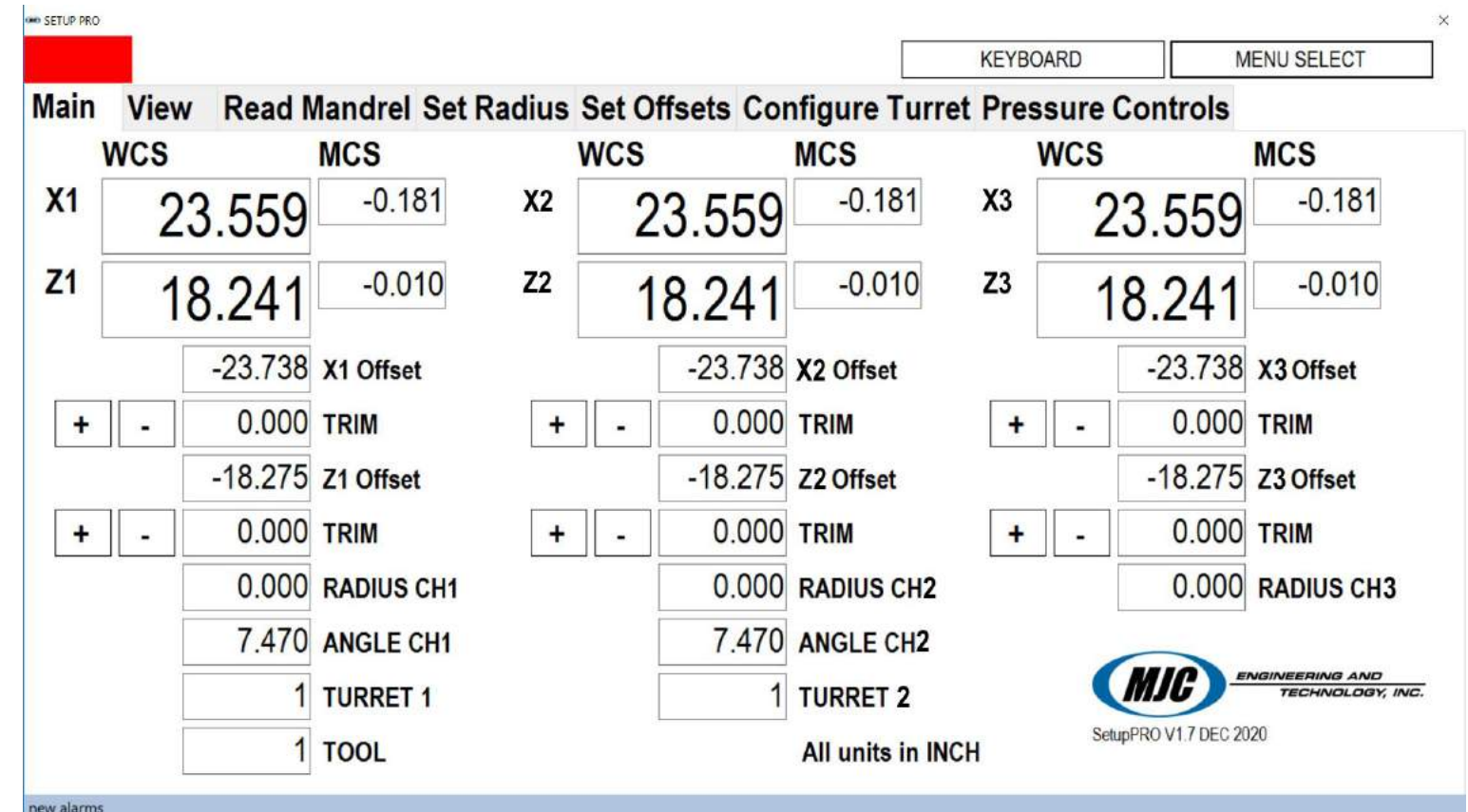
Heat Control Software



SetupPRO® Machine Set-up Utility

Basic Features:

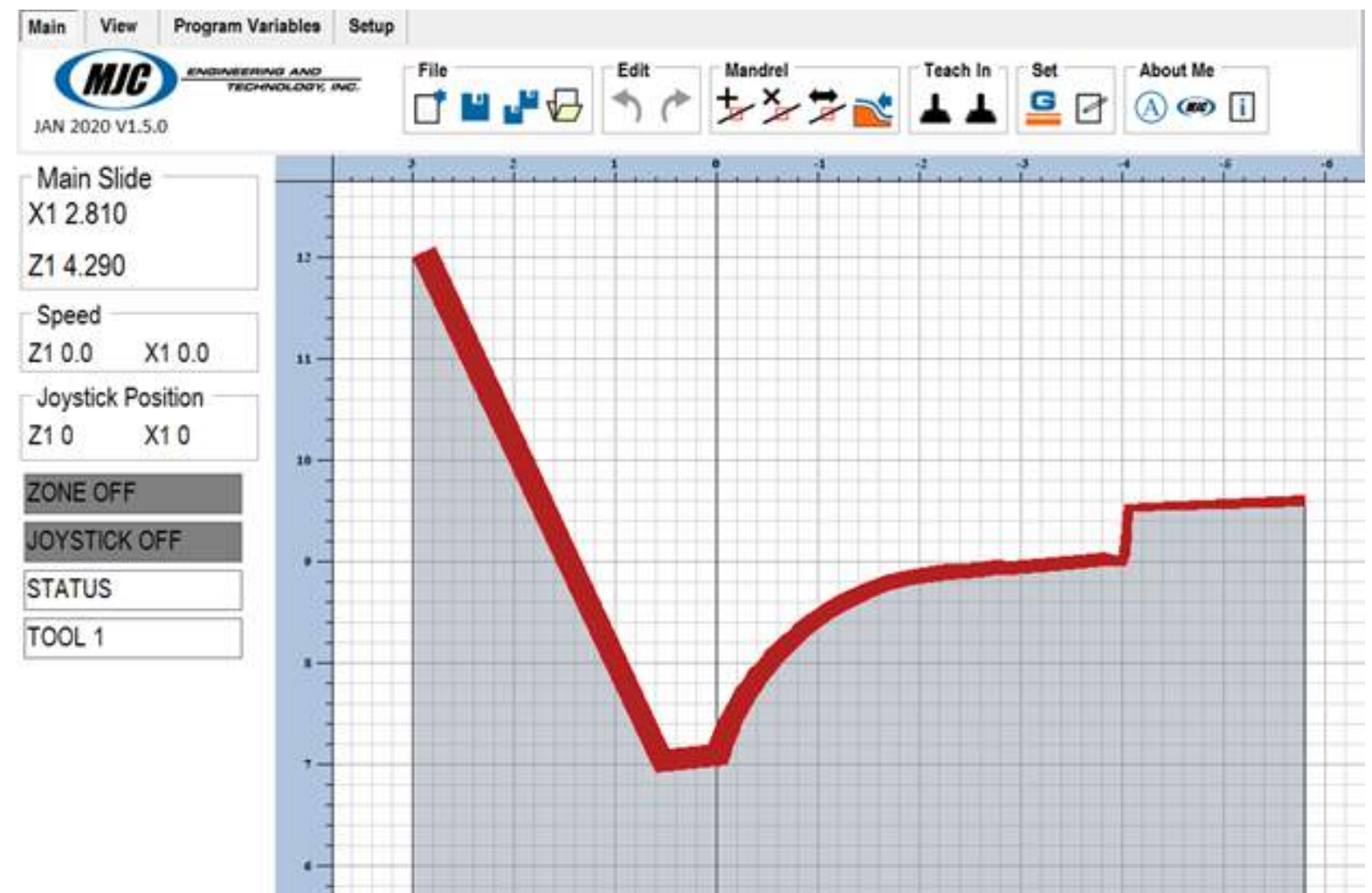
- Supports up to 6 coordinated axis and 2 turret tool changers.
- Simplifies the machine set up and adjusting of the CNC offsets.
- Easily find the slide rotation angle by touching off 2 points on the mandrel.
 - Assign tool positions and radii for 6 tools.
 - Set slide cushion pressure setpoints.
- Change tailstock pressure, open and close positions.





Basic Features:

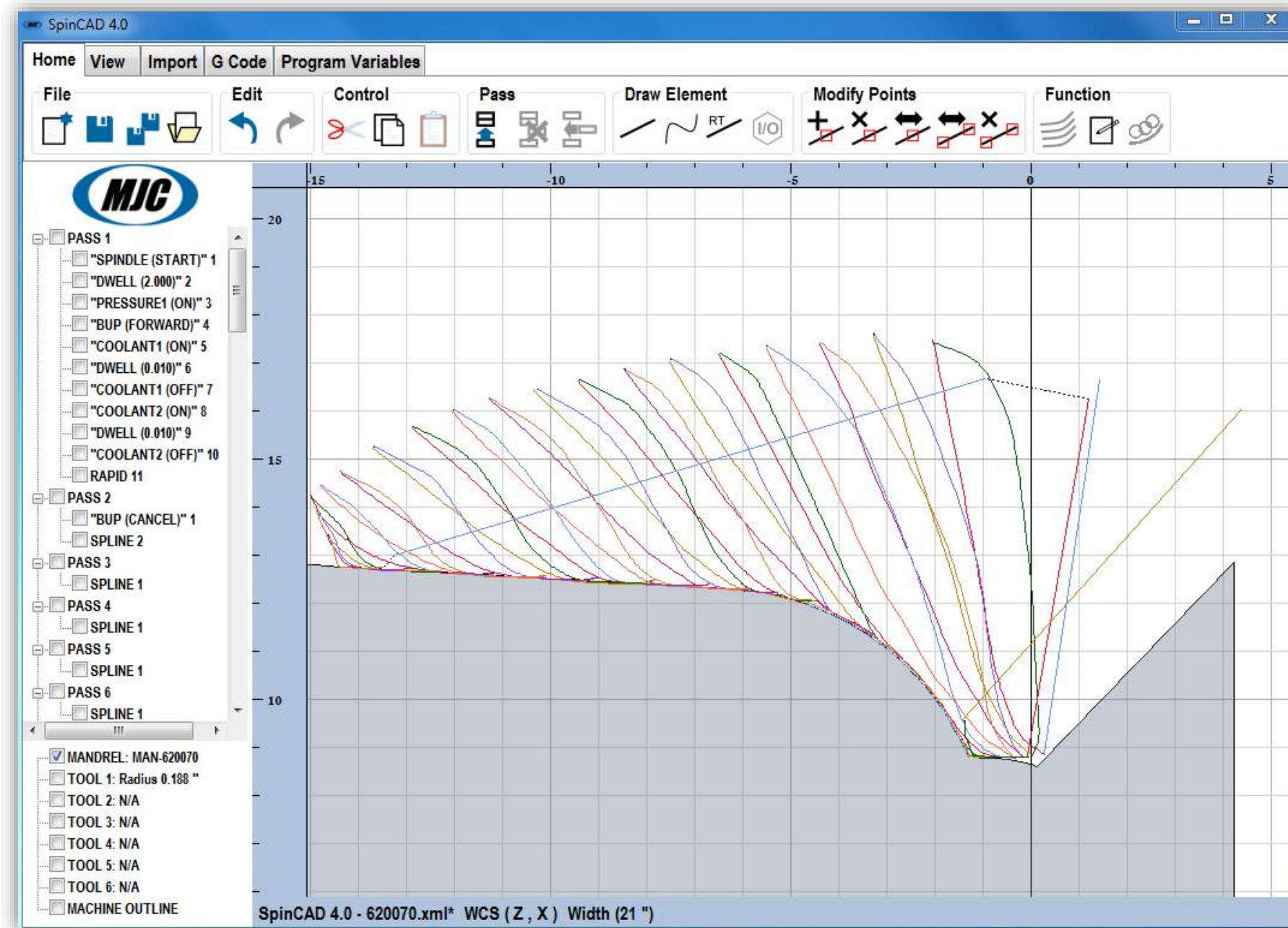
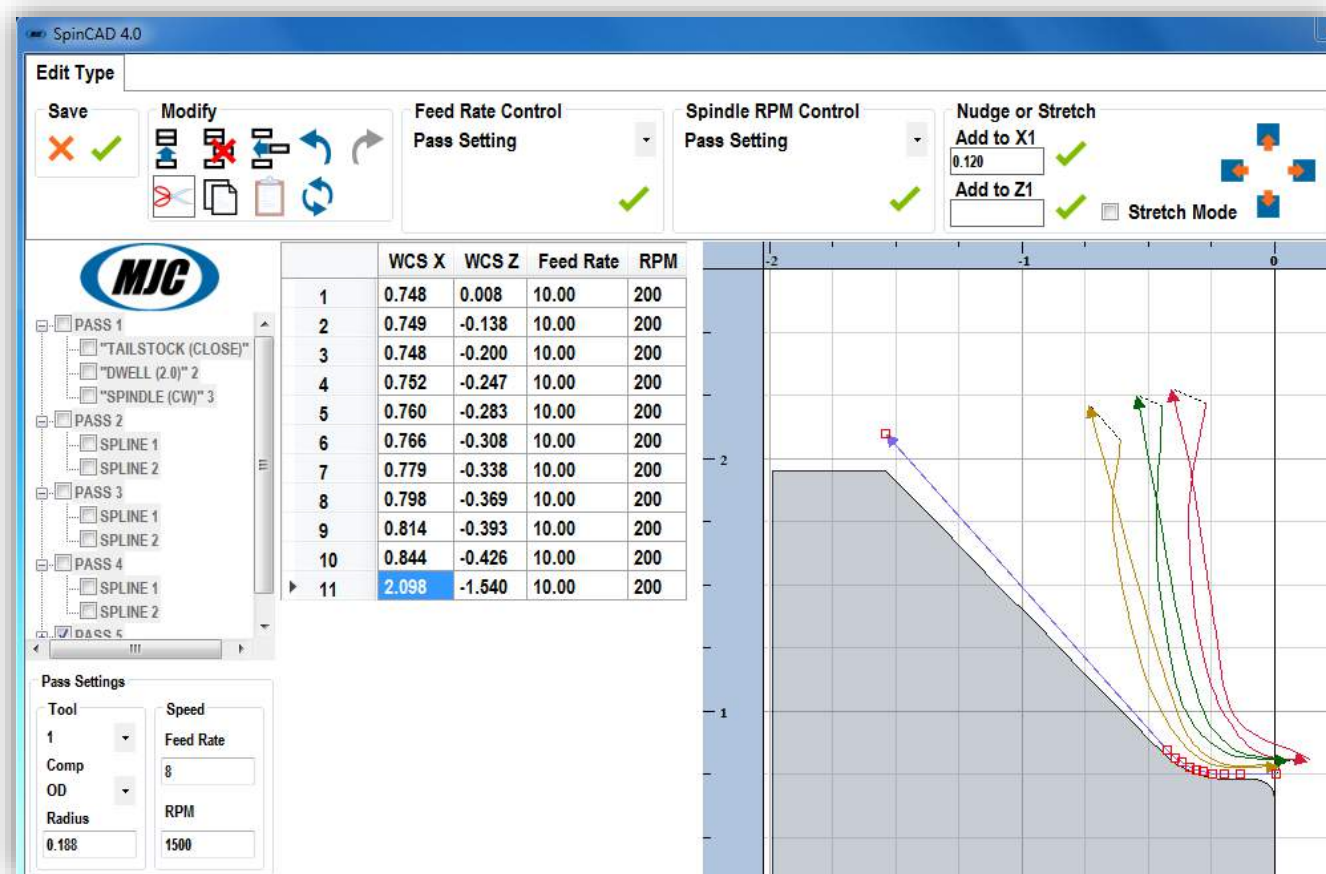
- Import mandrels, or teach in mandrels with a joystick.
- Edit protection zones that prevent CNC slide movement into mandrels, tailstocks, etc.
- **ZonePRO®** allows the operator to quickly and efficiently set a gap or offset for finished material against the form.
 - Teach in part programs with a joystick as well.
- Export mandrels, protection zones, and part programs that can be read and edited with **SpinCAD® 4.0**





Basic Features:

- Icon driven Microsoft Office format
- No prior CNC programming experience needed
- Live preview of changes
- Very customizable

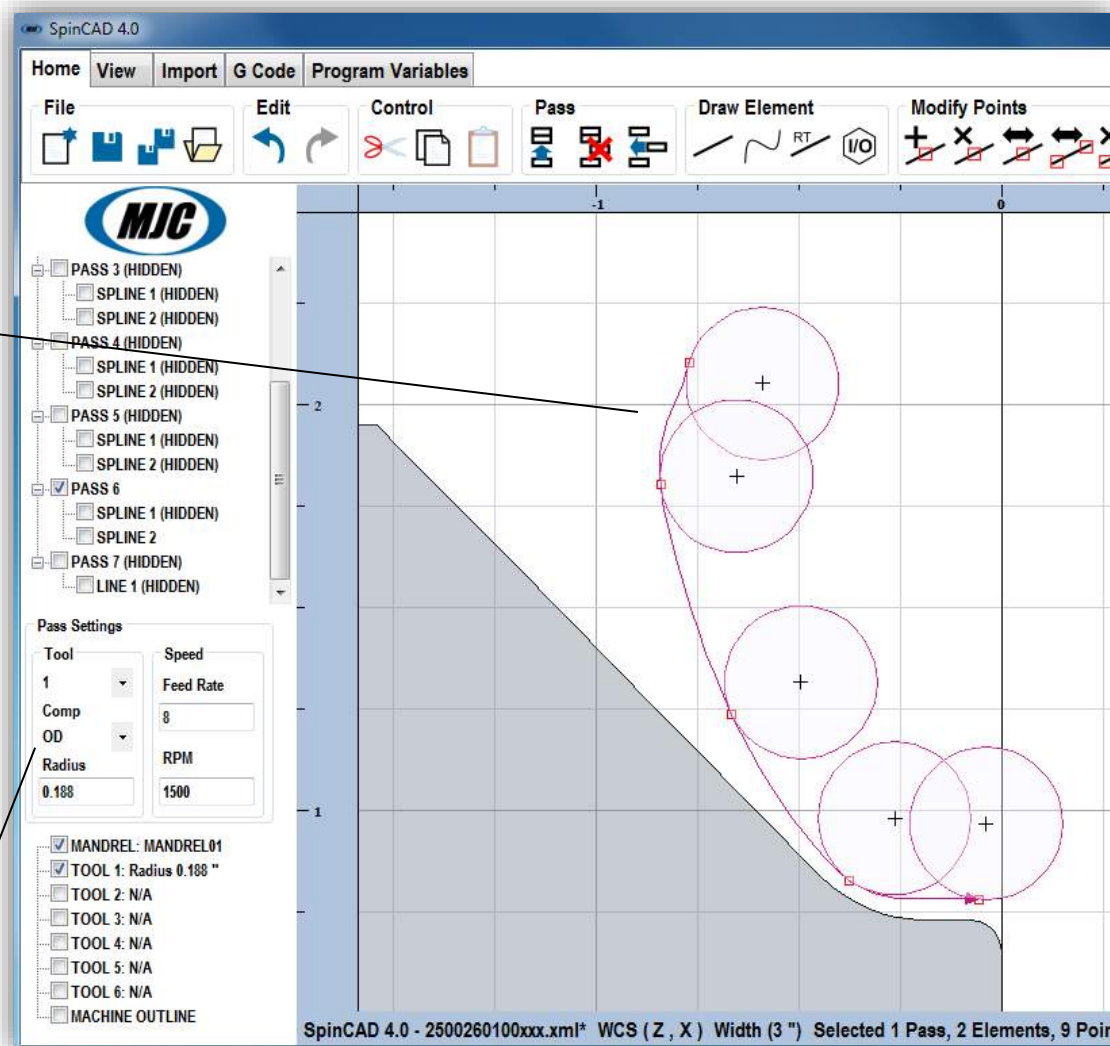




SpinCAD® 4.0 Rollers and Compensation

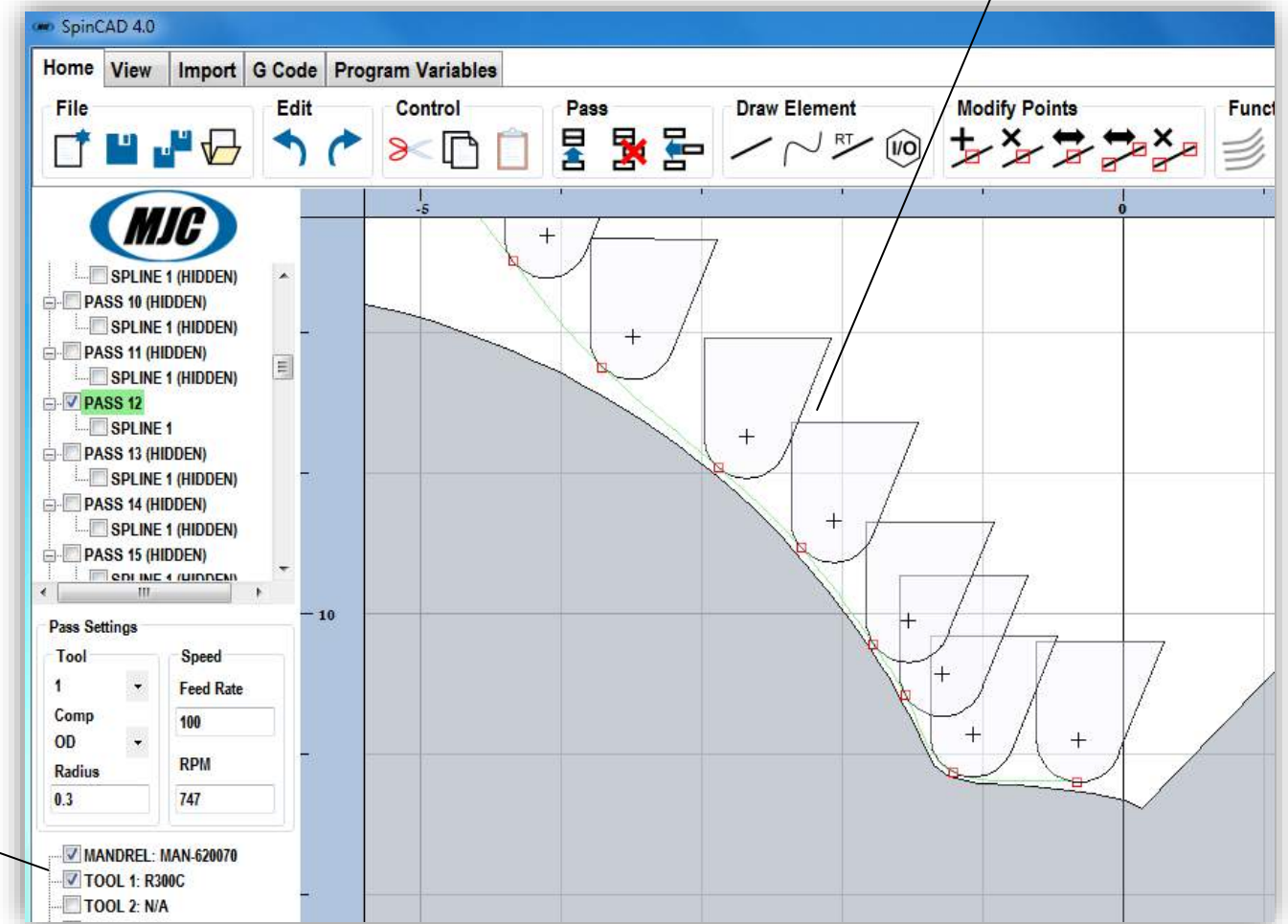
User-selectable roller radius compensation shows how the roller will contact the material during the pass.

Type in the roller radius and select which side of the material the roller is contacting: ID or OD.



SpinCAD® 4.0 can import roller .dxf files to accurately reflect the roller geometry and contact points in each pass.

The filename of the imported roller is displayed in Tool 1's name.

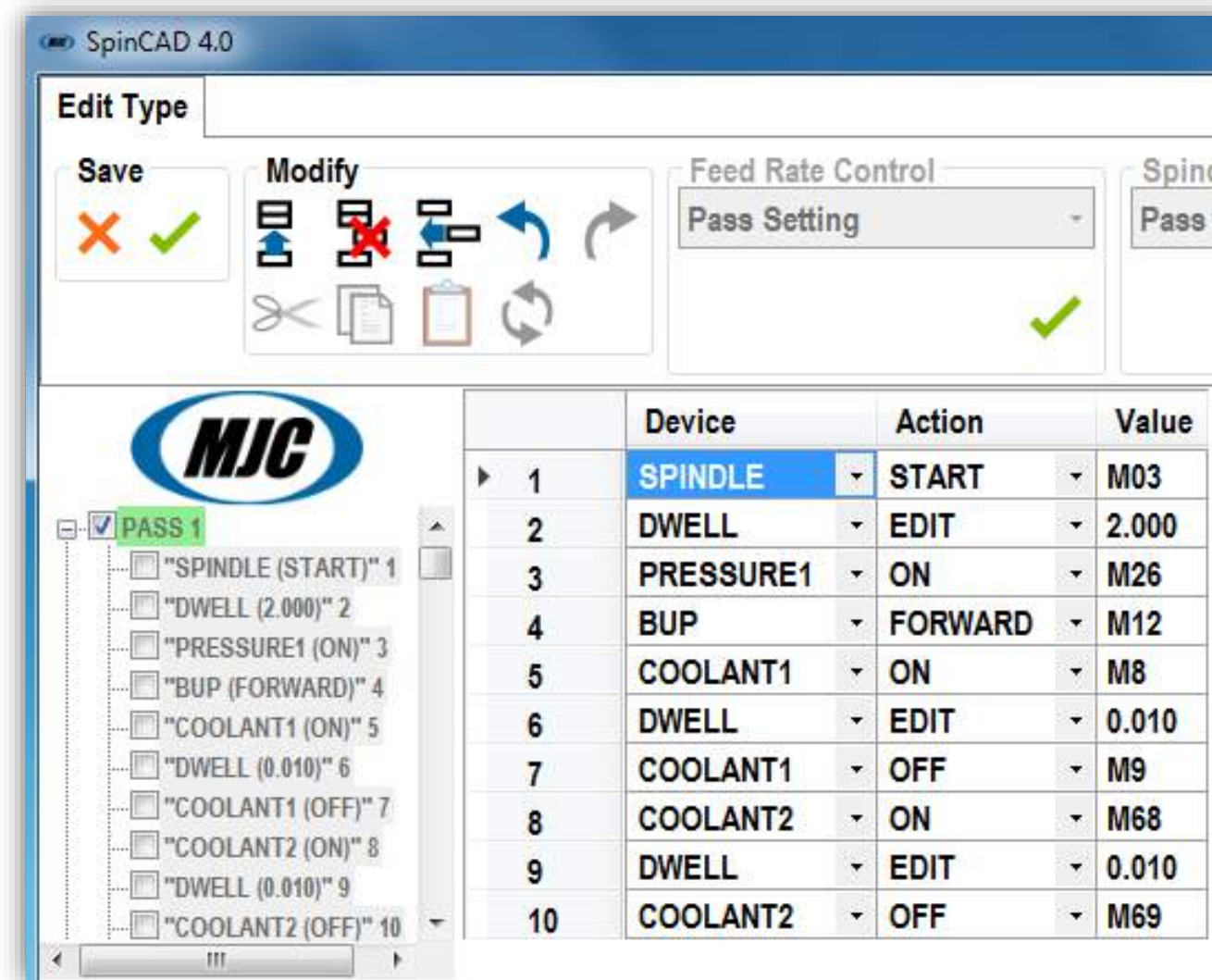




SpinCAD® 4.0 I/O Actions

MJC configures **SpinCAD® 4.0** specifically for your machine with each I/O (Input/Output).

Each function is written to be easily understood with simple actions i.e. “{who} is doing {what}”.

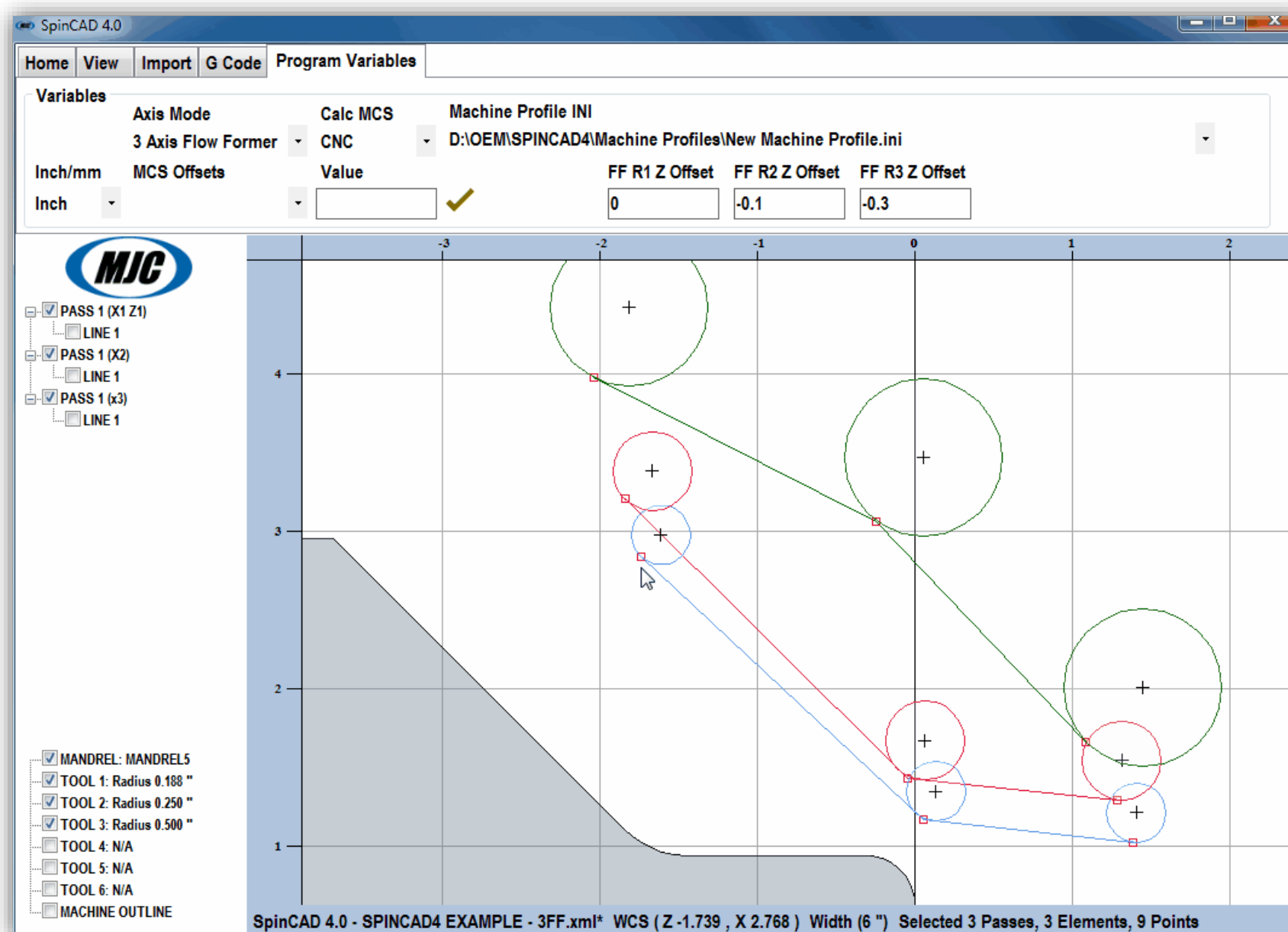


I/O actions can have any number of “Devices” and each can have any number of “Actions”.

	Device	Action	Value
1	SPINDLE	CW	M03
2	WAIT ZERO SPD	CW	M49
		CCW	
		STOP	



SpinCAD® 4.0 Multiple Axis Support



In this example X1 Z1 is the master axis, X2 and X3 are staggered in Z direction by a mechanical adjustment.

The X1, X2, X3 values can be individually adjusted.

X2 is shown with a 0.100" shift from Z1 and X3's shift is 0.300".

SpinCAD® 4.0 generates G Code for:

2 axis spinning machine

4 axis spinning machine

3 and 4 axis flow former

Oscillator neck and close forming machine

2 axis HAAS lathe



SpinCAD® 4.0 Cycle Time & Simulation

SpinCAD® 4.0 can estimate the Cycle

Time of a product based on:

- Movements
- Acceleration and deceleration
- Dwell times

SpinCAD® 4.0 generated sample output:

Time Stamp: 10/10/2019 - 7:32:22 AM

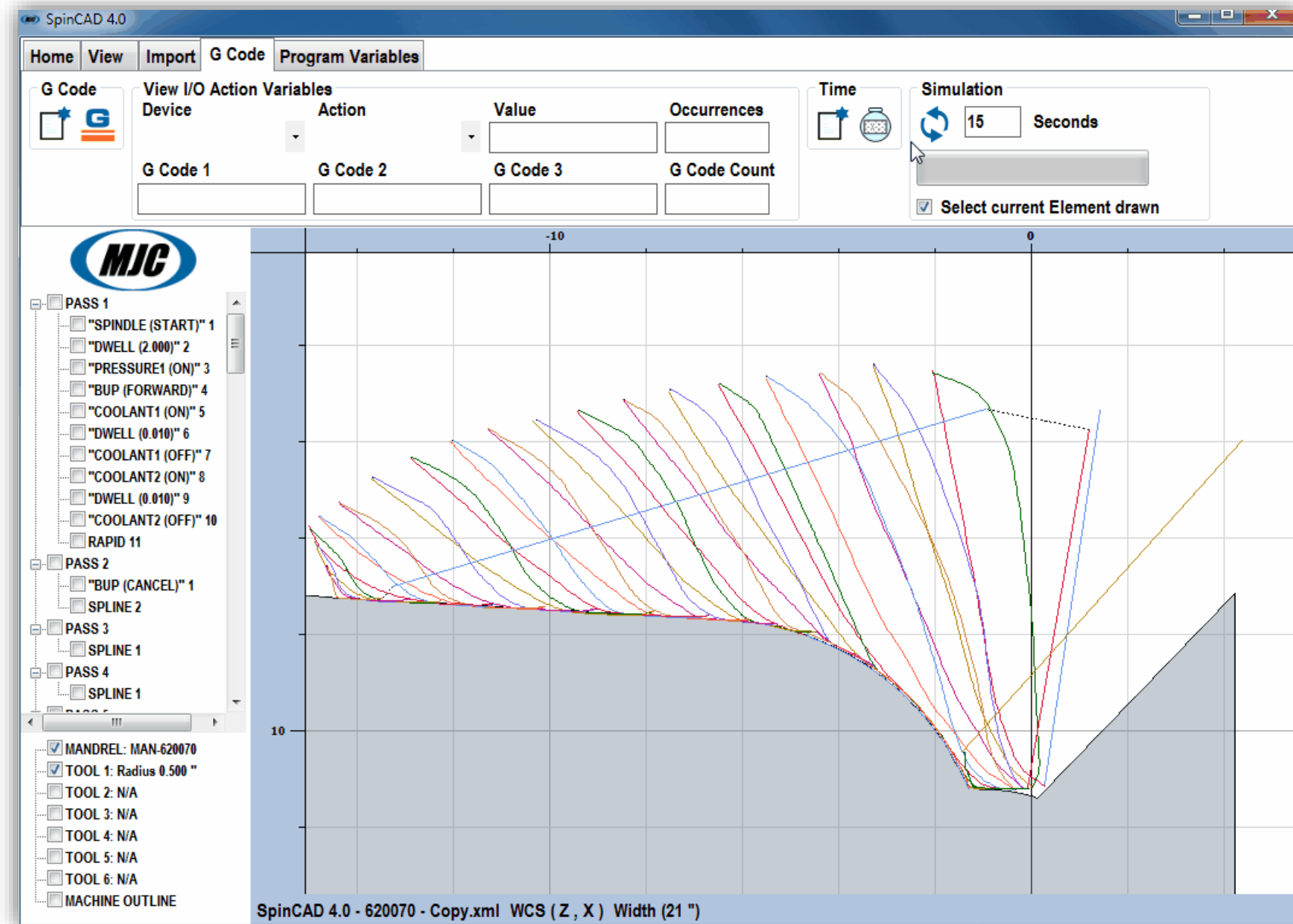
Axis Mode: 2 AXIS

File: C:\SPINCAD4\620070.xml

Estimated Cycle Time 233.9 seconds.

“Simulation” gives you a great visual aid of the forming process.

The playback can be sped up, slowed down or stopped.





DataPRO® is a user friendly software that is designed for recording of metal spinning machines' data.

Being able to look back at a production runs' forces and faults can be very useful.

Each field is customizable:

- Show/Hide
- Titles
- I/O Register
- Colors

WCS	KN	VEL	VOLT	LOAD	OFFLINE	Temp 1	Temp 2	Temp 3	Temp 4	
X1	25.255	10.0	40.125	6.03	25.0	742.6	749.4	740.9	750.3	
Z2	90.650	8.4	35.445	4.56	19.0	Pres 1	Pres 2	Pres 3	Pres 4	
X1	40.784	15.2	10.142	9.21	90.0	261	282	259	243	
X2	40.795	15.1	10.143	9.20	90.0	HYD RPM	GPM	KW	PSI	
X3	12.285	1.1	0.000	1.5	1.0	180.2	300.8	14.2	900.6	
X4	12.286	1.1	0.000	1.5	1.0					
						TARGET	OVRD	ACTUAL		
	NM_IN	NM_OUT	KW	LOAD	GEAR SELECTION	1200RPM	RPM	1200	100	1200
SP	8.135	10.782	20.28	70.0		FEED	49.4	100	49.4	

Customizable load bars to change color when above a set percentage.

Watch a playback.

Scroll to see any point of the production run.



This is **DataPRO®** graph utility that is customizable to show any of the recorded data points.

Problem: We want to know the exact data at 10s and 20s into the program.

Solution: Add event lines by clicking on the graphs. The numerical values will be shown here.





DataPRO® can load and playback part files' data history of velocity, position, kN, voltages, load, etc.

DataPRO® can also show the data graphically with up to 4 graphs on the screen at one time.

The graphs can be completely customized to reflect how the user wants to represent the data.

The screenshot shows the DataPRO software interface. At the top, there are menu tabs for 'Main', 'View', and 'Graph'. Below the menu is the MJC logo and the text 'ENGINEERING AND TECHNOLOGY, INC.' on the left, and 'SEPT 2019 V1.5.0' on the right. The main data area contains a table with columns for 'WCS inches', 'KN', 'VEL in/m', 'VOLT', and 'LOAD'. There are two rows of data, 'Z1' and 'X1', each with values of 0.000, 0, 0.000, 0.00 V, and 0% respectively. Below the table, there are three columns: 'TARGET', 'OVRD', and 'ACTUAL'. The 'RPM' row has values 0, 0, and 0. The 'FEED' row has values 0.00, 0, and 0.00. At the bottom left, there is a 'FILENAME: 2019 09 11 07 44 09.xml' field and a 'Time Interval' dropdown set to '22.5 s' with options for '0.25 s' and '0.5 s'. On the bottom right, there are buttons for 'PB SPEED' (set to 20), 'PLAYBACK', and 'UNLOAD'. A 'Status' label is at the bottom left of the window.

	WCS inches	KN	VEL in/m	VOLT	LOAD
Z1	0.000	0	0.000	0.00 V	0%
X1	0.000	0	0.000	0.00 V	0%

	TARGET	OVRD	ACTUAL
RPM	0	0	0
FEED	0.00	0	0.00

FILENAME: 2019 09 11 07 44 09.xml

Time Interval: 22.5 s (0.25 s, 0.5 s)

PB SPEED: 20

PLAYBACK

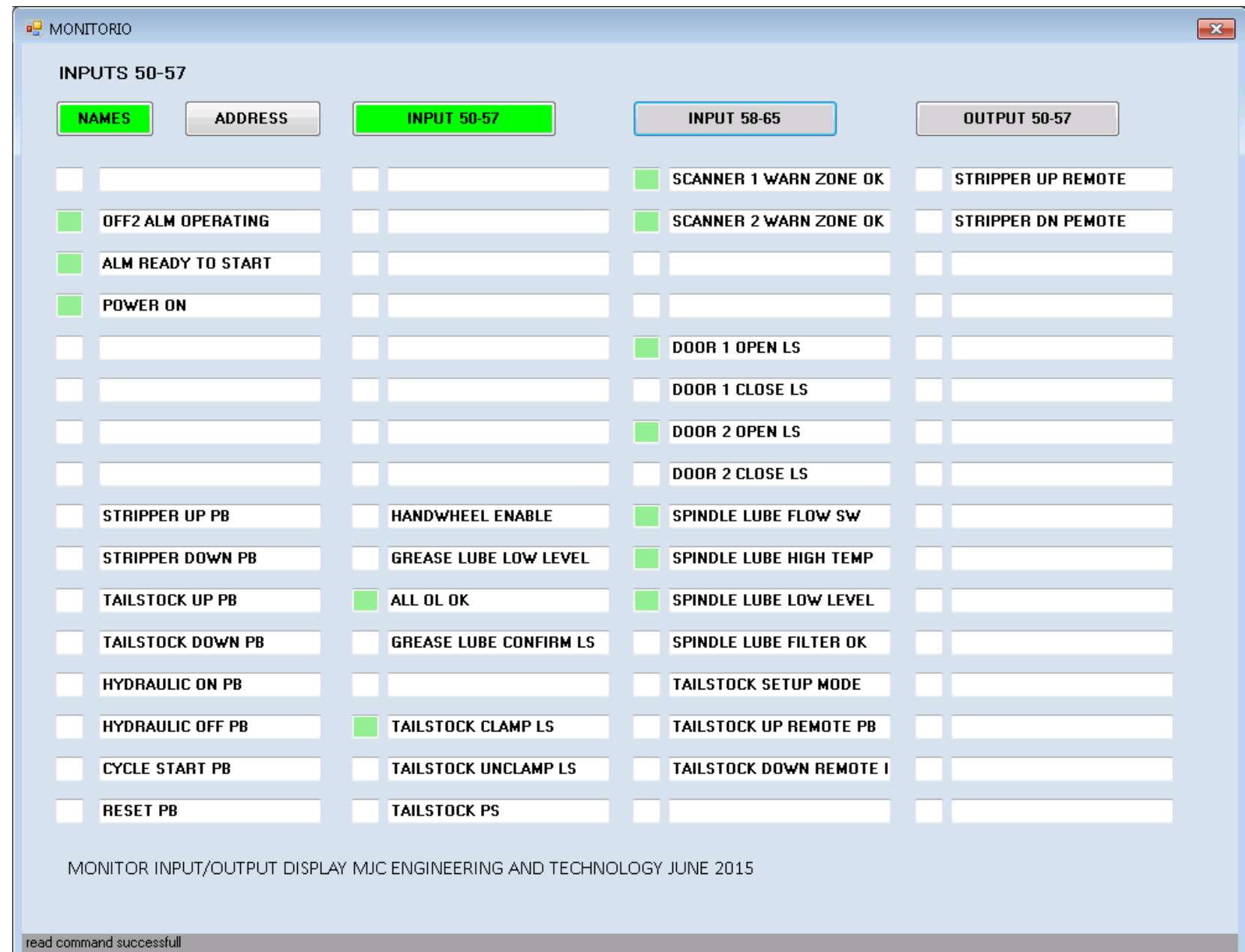
UNLOAD

Status



Basic Features:

- **I/O Monitor** is a quick reference to sensor data, setpoints, switches, etc.
 - Faster than checking a manual, both addresses and names are presented on the fly.
- **I/O Monitor** can be configured for any machine.





Basic Features:

- **MJC Dashboard** is collects information like: faults, maintenance, part production.
- Using this information we can calculate Overall Equipment Effectiveness (OEE).
- With preventive maintenance messages, this software is the next step to obtaining Industry 4.0 standards.
- See the total time spent on setup, loading, maintenance, or how long faults occur.
- **MJC Dashboard** can review any data from any given date range.

The screenshot displays the MJC Dashboard interface. At the top, it shows the MJC logo, a red status bar with '3000 Emergency stop', and the date 'MJC ENGINEERING AND TECHNOLOGY, JANUARY 2018'. Below this are 'LOG IN' and 'LOG OUT' buttons, and a 'CURRENT USER' section indicating 'Authenticated ADMIN' and 'User is an Administrator'. The 'CURRENT PART INFORMATION' section shows details for 'PRODUCT 1' and 'DESCRIPTION 8 D54110380-200-40-OD FINAL SPIN ID', along with 'SETUP REFERENCE X OFFSET: -150.555' and 'PROGRAM FILE D54FID3'. A navigation menu includes 'MAIN', 'ACTIVE FAULTS', 'MAINTENANCE MENU', 'AVAIL. HOURS CONFIG', 'EDIT PARTS LIST', and 'EDIT USER LIST'. The main data table has columns for 'Week Start Of', 'Week End Of', 'Id', 'Run Hours', 'Total Parts', 'Avg Parts Per Hour', 'Avg Setup Time', and 'START SETUP'. The table lists various events like 'OEE', 'POWER ON', 'HYD ON', 'PART SETUP', 'PART LOAD', 'MAINTENANCE', 'RUNTEST', 'RUN771', 'RUN511', and 'RUN536' with their respective run hours and total parts. On the right side, there are 'DATE FILTERS' for 'START DATE LIMIT' (2018/02/22 09:54:46 AM) and 'END DATE LIMIT' (2018/02/26 07:29:14 AM), and 'DATA REVIEW FILTERS' with radio buttons for 'CURRENT EVENTS', 'EVENT LOG', 'PRODUCTION LOG', 'FAULT LOG', 'FAULT STATISTICS', and 'OEE LOG'.

Week Start Of	Week End Of	Id	Run Hours	Total Parts	Avg Parts Per Hour	Avg Setup Time	START SETUP
2017/01/16 11:24:16 AM	2017/08/19 09:02:25 AM	OEE	0.000	43822	25.916	0	
2017/01/16 11:24:16 AM	2017/08/19 09:02:25 AM	POWER ON	0	0	0.000	0	
2017/01/16 11:24:16 AM	2017/08/19 09:02:25 AM	HYD ON	0	0	0.000	0	
2017/01/16 11:24:16 AM	2017/08/19 09:02:25 AM	PART SETUP	0	0	0.000	0	
2017/01/16 11:24:16 AM	2017/08/19 09:02:25 AM	PART LOAD	0	0	0.000	0	
2017/01/16 11:24:16 AM	2017/08/19 09:02:25 AM	MAINTENANCE	0	0	0.000	0	
2017/01/16 11:24:16 AM	2017/08/19 09:02:25 AM	RUNTEST	3.103	53	17.080	0	
2017/01/16 11:24:16 AM	2017/08/19 09:02:25 AM	RUN771	241.118	5347	22.176	0	
2017/01/16 11:24:16 AM	2017/08/19 09:02:25 AM	RUN511	29.704	702	23.633	0	
2017/01/16 11:24:16 AM	2017/08/19 09:02:25 AM	RUN536	1417.008	37720	26.619	0	



MJC Custom Screen Development: Automated Work Cell Controller

- **MJC** can develop any screen for a custom application, for example: an ABB robot automated work cell controller.
- This controller monitors and operates 3 work cells, setting the correct I/O to give orders to the ABB robots.
- This software can be customized to only allow certain logged in users to execute any actions.
- Select the part via a barcode scanner, and send a cycle start command right to the CNC.

OP20

MJC ENGINEERING AND TECHNOLOGY, AUGUST 2016

User not authenticated ID P/N SIZE PROGRAM NUMBER
 User is not a valid User 511 53123511095 15 x 4 1, RUN511

LOG IN LOG OUT
 EDIT PART EDIT USERS
 START DATE END DATE
 11/ 8/2016 11/ 8/2016
 START DATE LIMIT END DATE LIMIT
 FILTER DATA POP UP

CELL 1 START CELL 1 STOP/ LAST PART
 CELL 2 START CELL 2 STOP/ LAST PART

CELL 1
 READY
 RUNNING
 BYPASS
 SCANNER VIOLATION

ROBOT 1
 READY FOR LOAD/UNLOAD
 CLEAR OF OP2

OP10A
 READY
 WAITING FOR PART
 SPINNING PART
 PART DONE

OP2
 DOOR 1 CLOSED
 DOOR 1 OPEN
 DOOR 2 CLOSED
 DOOR 2 OPEN
 READY
 REQUEST PART FROM OP1A
 PART FROM OP1A COMPLETE
 REQUEST PART FROM OP1B
 PART FROM OP1B COMPLETE

CELL 2
 READY
 RUNNING
 BYPASS
 SCANNER VIOLATION

ROBOT2
 READY FOR LOAD/UNLOAD
 CLEAR OF OP2

OP10B
 READY
 WAITING FOR PART
 SPINNING PART
 PART DONE

Time	Part Number	Program File	X1 Offset	X2 Offset	RPM OVR	FEED OVR	Count Total	Currer Count

DATA REVIEW
 FAULTS
 STATISTICS
 CURRENT



MJC Custom Screen Development: Automated Work Cell – Part Record

- **MJC** can develop any screen for a custom application, this screen is an extension of the last example: a Part Length Recorder and Controller.
- This controller monitors the part length via how far the part ejector pushed the part and the tailstock.
- This software also analyzes that part length, and sends a “Park OK”, “Needs Correction”, or “Part Reject” command to the ABB robot. Then that robot can drop the part off in the correct area, to the next process or to be scrapped.

MJC ENGINEERING AND TECHNOLOGY, AUGUST 2016

Authenticated ADMIN
User is an Administrator

ID: XXXX P/N: RUN TEST SIZE: NA PROGRAM NUMBER: 0, RUNTEST

LOG IN LOG OUT EDIT PART EDIT USERS OP10

NOMINAL: 6.46 TOL SHORT 1: 0.100 TOL LONG 1: 0.100 TOL SHORT REJ: 0.100 TOL LONG REJ: 0.150 REJECT SEQ: 0

LENGTH @ TS: [] TS POSITION: 30.286 STRIP POSITION: 6.150 DELTA: [] CORRECTION: 0 CURRENT COUNT: 0 REJECT TOTAL: 0

PART OK
 SHORT REJECT
 SHORT NEEDS CORRECTION
 LONG NEEDS CORRECTION
 LONG REJECT

DATA REVIEW
 FAULTS
 STATISTICS
 CURRENT

START DATE: 2016/10/20
START DATE LIMIT: 2016/10/14 11:49:31 AM
END DATE: 2016/10/28
END DATE LIMIT: 2016/10/28 10:42:13 AM

READY
WAITING FOR PART
SPINNING PART
PART DONE

REFRESH PART NUM RUN PART FILTER DATA POP UP

Time	Part Number	Program File	Nom	Tol Short 1	Tol Long 1	Tol Short Reject	Tol Long Reject	Delta	Part Length @TS	X1 Offset	X2 Offset	RPM OVR	FEED OVR	Cour Tote
2016/10/28 10:42:13 AM	53123771095	RUN771	11.7	0.1	0.1	0.15	0.15	0.038	11.738	0.010	0.010	105	100	227
2016/10/28 10:37:12 AM	53123771095	RUN771	11.7	0.1	0.1	0.15	0.15	0.038	11.738	0.010	0.010	105	100	226
2016/10/28 10:32:14 AM	53123771095	RUN771	11.7	0.1	0.1	0.15	0.15	0.082	11.782	0.010	0.010	105	95	225
2016/10/28 10:27:08 AM	53123771095	RUN771	11.7	0.1	0.1	0.15	0.15	0.056	11.756	0.010	0.010	105	95	224
2016/10/28 10:18:09 AM	53123771095	RUN771	11.7	0.1	0.1	0.15	0.15	0.047	11.747	0.010	0.010	105	95	223
2016/10/28 10:11:27 AM	53123771095	RUN771	11.7	0.1	0.1	0.15	0.15	0.047	11.747	0.010	0.010	105	95	222
2016/10/28 10:05:00 AM	53123771095	RUN771	11.7	0.1	0.1	0.15	0.15	0.038	11.738	0.010	0.010	105	95	221
2016/10/28 09:57:55 AM	53123771095	RUN771	11.7	0.1	0.1	0.15	0.15	0.038	11.738	0.010	0.010	105	95	220
2016/10/28 09:51:26 AM	53123771095	RUN771	11.7	0.1	0.1	0.15	0.15	-0.041	11.659	0.010	0.010	100	95	219



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Personnel



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