This documents which Java/C++ WPILIB routines have been duplicated in LabVIEW, and which ones are not needed (for example because all that is needed is a cluster unpack function), and what isn't done....yet...

VI / CTL Totals
VI Total (X)
CTL Total (Z)
VI Shell Total (I)
CTRL Shell Total (I)

CTRL Shell Total (I)

Doc completed Pct 99.35% Optimization Pct 55.72%

Optimize legend: S = Subroutine, I = Inline, X = reviewed, nothing done. (In some cases, after sufficient debug and use, additional optimizations could be considered.)

'======== BASE

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	VI Name AnalogDelay.vi	Function Prototype	Notes Similar to interpolated tree map	Code Review	Test Program	Error Checking
	VI Name	Function Prototype	Notes	Code Review	Test Program	Error Checking
	FunctionGenerator_Add_Value.vi		Similar to interpolated tree map			
	FunctionGenerator_Add_XY.vi FunctionGenerator_Calculate.vi		Similar to interpolated tree map			
$egin{array}{ c c c c c c c c c c c c c c c c c c c$	FunctionGenerator_Calculate.vi FunctionGenerator_Clear.vi		Similar to interpolated tree map			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	FunctionGenerator_Clear.vi		Similar to interpolated tree map			
	FunctionGenerator New.vi		Similar to interpolated tree map			
		Function Prototype	Notes	Code Review	Test Program	Error Checking
FUNCTION GENERATOR MATRIX X X X X I	FunctionGeneratoMatrixr_Add.vi		Similar to interpolated tree map			
X X X X I	FunctionGenerator_Calculate.vi		Similar to interpolated tree map			
X X X X SI	FunctionGenerator_New.vi		Similar to interpolated tree map			
Implemented Documented Not WPILIB Menu Item Execution Optimized Test Routine Sample Program	VI Name	Function Prototype	Notes	Code Review	Test Program	Error Checking

nentation update.												
LINEAR FILTER		Χ		Χ	1		LinearFilter_BackwardFiniteDifference.vi					
	X	X		X	SI		LinearFilter Calculate.vi					
	Χ	Χ	Χ	X	X		LinearFilter_CutoffFrequency.vi					
-	X	X	X	X	1		X LinearFilter Execute.vi		Labview style helper			
-	X	X		No			LinearFilter Factorial.vi		AN INTERNAL ROUTINE			
-				740			Linear liter_ractoria.vi		ANTINIERNALIKOOTINE			
	X	X			1							
	Χ	Χ		Χ	Χ		LinearFilter_HighPass.vi					
	X	Χ	Χ	X			LinearFilter_HighPassBW1.vi					
	X	Χ	Χ	X	X		LinearFilter_HighPassBW2.vi					
	X	Χ	Χ	X	X		LinearFilter_LowPassBW1.vi					
		Χ	X	X	Χ		LinearFilter LowPassBW2.vi					
	X	X		X	X		LinearFilter_MovingAverage.vi					
	X	X		X	1		LinearFilter New.vi					
-				· ^	SI		LinearFilter Reset.vi					
	X	X		X								
			Χ	Χ	SI		LinearFilter_ResetToValue.vi					
	X	Χ		X	X		LinearFilter_SinglePoleIIR.vi					
	X	X	X	X	X		LinearFilter_TimeConst.vi					
MEDIAN FILTER∫	< Implemented	X Documented	Not WPILIB	X Menu Item	< Execution Optimized	Test Routine	S VI Name MedianFilter Calculate.vi	Function Prototype	Notes	Code Review	Test Program	Error Checking
MEDIAN FILTER				X	X							
	X	X	Χ		I		X MedianFilter_Execute.vi		Labview style helper			
	X	X		Χ	SI		MedianFilter_New.vi					
	X	X		Χ	SI		MedianFilter Reset.vi					
	X	Χ	Χ		SI		MedianFilter_ResetToValue.vi					
SLEW RATE FILTER	X X X	X X	Χ	X	1	Test Routine	VI Name SlewRateLimiter_Calculate.vi SlewRateLimiter_Close.vi X SlewRateLimiter_Execute.vi SlewRateLimiter_Execute.vi SlewRateLimiter_GetRate.vi SlewRateLimiter_New.vi	Function Prototype	Notes Labview style helper	Code Review	Test Program	Error Checking
		Χ		X	1		SlewRateLimiter_NewInitialZero.vi					
		Χ		Χ	1		SlewRateLimiter_Reset.vi					
	X	X		X	ol lized		SlewRateLimiter_SetRate.vi					
	Implemented	Documented	Not WPILIB	Menu Item	Execution Optin	Test Routine	S Ample Program	Function Prototype	Notes	Code Review	Test Program	Error Checking
TIMER				X			Timer Close.vi		releases semaphore			
	X	X		X			X Timer_Get.vi		,			
	X	X	Y	X			Timer GetAndReset.vi					
ŀ		X	<u>У</u>	No			Timer GetInternal.vi		Internal (private) only			
-			^	X					internal (private) Only			
-	X	X		X			X Timer_HasPeriodPassed.vi		+			
_			Χ	X			X Timer_HasPeriodPassedOnce.vi					
	X	Χ		X			X Timer_New.vi					
	Χ	Χ		Χ			X Timer_Reset.vi					
Ţ		Χ	Χ	No			Timer ResetInternal		Internal (private) only			
F									11 / 1			
	X	X		X			X Timer Start vi				1	
	X	X		X			X Timer_Start.vi X Timer_Stop.vi					

24/2022 – After documentation update.													
TIME INTERPOLATABLE BOOLEAN	X Implemented	X Documented	X Not WPILIB	X Menu Item	- Execution Optimized	Test Routine		VI Name TimeInterpBoolean_AddSample.vi		Notes Update to use create matrix	Code Review	Test Program	Error Checking
	X	X	X	No	1			TimeInterpBoolean_CleanUp.vi		Update to use create matrix			
	X	X	X	Χ	SI			TimeInterpBoolean_Clear.vi					
	X	X X	$\frac{X}{Y}$	X	SI			TimeInterpBoolean_GetSample.vi TimeInterpBoolean_New.vi					
	X	X	$\frac{\lambda}{X}$	X	SI			TimeInterpBoolean_New.vi					
	Implemented	Documented	Not WPILIB	Menu Item	Execution Optimized	Test Routine	Sample Program				Code Review	st Program	Error Checking
		۵	_≥						Function Prototype	Notes	ပိ		<u>E</u>
TIME INTERPOLATABLE DOUBLE	X	X X	X	X No				TimeInterpDouble_AddSample.vi TimeInterpDouble_CleanUp.vi		Update to use create matrix Update to use create matrix			
	X	X	$\frac{\lambda}{X}$	X				TimeInterpDouble_Clear.vi		Opdate to use create matrix			
	X	X	X	Χ	1			TimeInterpDouble_GetSample.vi					
	Χ	Χ	Χ	Χ	SI			TimeInterpDouble_New.vi					
	Χ	Χ	_X	Χ	SI			TimeInterpDouble_SetMaxTime.vi					
	Implemented	Documented	Not WPILIB	Menu Item	Execution Optim	Test Routine	Sample Program		<u> </u>	Notes	Code Review	Test Program	Error Checking
TIME INTERPOLATABLE POSE2D	X	X	X	X No	1			TimeInterpPose2d_AddSample.vi TimeInterpPose2d_CleanUp.vi		Update to use create matrix Update to use create matrix			
	X	\hat{x}	$\frac{\hat{x}}{X}$	X	SI			TimeInterpPose2d_Clean.vi		Opdate to use create matrix			
	X	X	Χ	Χ	1			TimeInterpPose2d_GetSample.vi					
	X	X	X	Χ	SI			TimeInterpPose2d_New.vi					
	X	Χ	_X	Χ	SI			TimeInterpPose2d_SetMaxTime.vi					
TIME INTERPOLATABLE ROTATION2D		X Documented	X Not WPILIB	X Menu Item	Execution Optimized	Test Routine		TimeInterpRotation2d_AddSample.vi	71	Notes Update to use create matrix	Code Review	Test Program	Error Checking
	X	X	X	No	SI			TimeInterpRotation2d_CleanUp.vi TimeInterpRotation2d_Clear.vi		Update to use create matrix			
	X	X	X	X	1			TimeInterpRotation2d_Clear.vi TimeInterpRotation2d_CetSample.vi					
	X	Χ	Χ	Χ	SI			TimeInterpRotation2d_New.vi					
	X	Χ	_X	Χ	SI			TimeInterpRotation2d_SetMaxTime.vi					
	Implemented	Documented	Not WPILIB	Menu Item	Execution Optimized	Test Routine			Function Prototype	Notes	Code Review	Test Program	Error Checking
WAIT ADJUST			X	_				WaitAdjust.vi					

After documentation update.	nplemented	ocumented	lot WPILIB	lenu Item	xecution Optimized	est Routine	Sample Program emple Program	Function Prototype	Notes	ode Review	est Program	iror Checking
DIGITAL SEQUENTIAL LOGIC	X	X	_ <u><</u>	<i>X</i>	Ш	_	DigSeqLogic_Delay.vi	runction Prototype	Notes			
	X	X	X	X			DigSeqLogic_On_Delay.vi					
	X	X	Χ	X			DigSeqLogic_Off_Delay.vi					
	Χ	Χ	Χ	Χ			DigSeqLogic_One_Shot.vi					
	X	X	X	Χ			DigSeqLogic_SR_Flip_Flop.vi					

	Implemented	Documented	Not WPILIB	Menu Item	Execution Optimiz	Test Routine	Sample Program	Function Prototype	Notes	Code Review	Test Program	Error Checking
DEBOUNCER	Χ	Χ		X			Debouncer_New.vi					
	X	Χ		X			Debouncer_Calculate.vi					
	Χ	X	X	X			Debouncer_Execute.vi					
	X	X		No			Debouncer_Reset.vi					
	Χ	Χ		No			Debouncer_HasElapsed.vi					

'======== CONTROLLER '========

	Implemented	Documented	Not WPILIB	Menu Item	Execution Optimized		Name	Function Prototype Notes	Code Review	Test Program	Error Checking
ARM FF	Χ	X		X			mFF_Calculate.vi				
	Χ	X		X		Ar	mFF_CalculateVelocityOnly.vi				
			Χ				mFF_Execute.vi	LabVIEW style	single call		
			Χ			Ar	mFF_ExecuteVelocityOnly.vi	LabVIEW style	single call		
	Χ	X		X		Ar	mFF_MaxAchieveAccel.vi				
	Χ	X		X		Ar	mFF_MaxAchieveVelocity.vi				
	Χ	X		X		Ar	mFF_MinAchieveAccel.vi				
	Χ	Χ		X			mFF_MinAchieveVelocity.vi				
	Χ	Χ		X		Ar	mFF_New_ZeroGravity.vi				
	Χ	Χ		X		Ar	mFF_New.vi				

	Implemented	Documented	Not WPILIB	Menu Item	Execution Optimiz	Test Routine	Name Frogram	Function Prototype	Notes	Code Review	Test Program	Error Checking
BANG BANG	Χ	X		X	SI		BangBang_AtSetpoint.vi					
	Χ	Χ		X	SI		BangBang_Calculate_PV.vi					
	Χ	Χ		Χ	SI		BangBang_Calculate_SP_PV.vi					
	Χ	Χ	X	X	SI		BangBang_Execute.vi					
	Χ	Χ		X	SI		BangBang_GetAll.vi					
	Χ	Χ		X	SI		BangBang_GetError.vi					
	Χ	Χ		X	SI		BangBang_New.vi					
	Χ	Χ		X	SI		BangBang_SetSetpoint.vi					
	X	X		X	SI		BangBang_SetTolerance.vi					

	. Implemented	Documented	Not WPILIB	Menu Item	Execution Optimized	Test Routine	Nample Program	Function Prototype	Notes	Code Review	Test Program	Error Checking
CONTROLLER UTIL	X	X		X	SI		ControllerUtil_GetModulusError.vi		This was short lived in WPILIB, but still useful here.			
ELEV FF	X Implemented	X Documented	Not WPILIB	X Menu Item	Execution Optimized	Test Routine	S VI Name ElevFF Calculate.vi	Function Prototype	Notes	Code Review	Test Program	Error Checking
LLLVII	X	X		\hat{x}			ElevFF_CalculateVelocityOnly.vi					
			Χ	,			ElevFF_Execute.vi		LabVIEW style single call			
	X	V	X	~			ElevFF_ExecuteVelocityOnly.vi ElevFF MaxAchieveAccel.vi		LabVIEW style single call			
	X	X		X			ElevFF_MaxAchieveAccel.vi ElevFF_MaxAchieveVelocity.vi					
	X	X		X			ElevFF MinAchieveAccel.vi					
	X	Χ		X			ElevFF_MinAchieveVelocity.vi					
	X	Χ		Χ			ElevFF_New_ZeroAccel.vi					
	X	Χ		X			ElevFF_New.vi					
	Implemented	Documented	Not WPILIB	Menu Item	Execution Op	Test Routine	Sample Program	Function Prototype	Notes	Code Review	Test Program	Error Checking
HOLDBY OTO:			X				LI-ID-Otel Adv.O-levilete Toelevier			ၓ		
HOL_DRV_CTRL		Χ		X			HolDrvCtrl_AdvCalculate_Trajectory.vi		Added 1/24/2022		7	
HOL_DKV_CTRL	Χ	Χ	X	Χ	CI		HolDrvCtrl_AdvCalculate.vi		Added 1/24/2022 Added 1/24/2022	<u> </u>	7	
HOL_DKV_CTRL	X	X	X	X	SI		HolDrvCtrl_AdvCalculate.vi HolDrvCtrl_AtReference.vi		Added 1/24/2022 Added 1/24/2022 Added 1/26/21	გ	7	
HOL_DKV_CTRL	X X X	<i>X X</i>	X	X X X	SI I		HolDrvCtrl_AdvCalculate.vi HolDrvCtrl_AtReference.vi HolDrvCtrl_Calculate_Trajectory.vi		Added 1/24/2022 Added 1/24/2022 Added 1/26/21 Added 1/26/21	8	7	
HOL_DKV_CTRL	X X X X	<i>x x x x</i>	X	X X X X	SI I		HolDrvCtrl_AdvCalculate.vi HolDrvCtrl_AtReference.vi HolDrvCtrl_Calculate_Trajectory.vi HolDrvCtrl_Calculate.vi HolDrvCtrl_Execute_Trajectory.vi		Added 1/24/2022 Added 1/24/2022 Added 1/26/21	<u></u> წ	7	
HOL_DKV_CTRL	X X X X X	<i>X X X X X</i>	X	X X X X X	I		HolDrvCtrl_AdvCalculate.vi HolDrvCtrl_AtReference.vi HolDrvCtrl_Calculate_Trajectory.vi HolDrvCtrl_Calculate.vi HolDrvCtrl_Execute_Trajectory.vi HolDrvCtrl_Execute_Vi		Added 1/24/2022 Added 1/24/2022 Added 1/26/21 Added 1/26/21 Added 1/26/21 Added 1/26/21 Added 1/24/2022 Future	8	7	
HOL_DKV_CTRL	X X X X X X	<i>X X X X X X</i>	X X X	X X X X X X	I I		HolDrvCtrl_AdvCalculate.vi HolDrvCtrl_AtReference.vi HolDrvCtrl_Calculate_Trajectory.vi HolDrvCtrl_Calculate.vi HolDrvCtrl_Execute_Trajectory.vi HolDrvCtrl_Execute.vi HolDrvCtrl_New.vi		Added 1/24/2022 Added 1/24/2022 Added 1/26/21 Added 1/26/21 Added 1/26/21 Added 1/26/21 Added 1/24/2022	8	7	
HOL_DKV_CTRL	X X X X X X	x x x x x x x x x	X X X	X X X X X X X	I		HolDrvCtrl_AdvCalculate.vi HolDrvCtrl_AtReference.vi HolDrvCtrl_Calculate_Trajectory.vi HolDrvCtrl_Calculate.vi HolDrvCtrl_Execute_Trajectory.vi HolDrvCtrl_Execute.vi HolDrvCtrl_New.vi HolDrvCtrl_PackExecuteSP.vi		Added 1/24/2022 Added 1/24/2022 Added 1/26/21 Added 1/26/21 Added 1/26/21 Added 1/26/21 Added 1/24/2022 Future Added 1/26/21	8	7	
HOL_DKV_CTRL	X X X X X X X	X X X X X X X	X X X X	X X X X X X X X	I I		HolDrvCtrl_AdvCalculate.vi HolDrvCtrl_AtReference.vi HolDrvCtrl_Calculate_Trajectory.vi HolDrvCtrl_Calculate.vi HolDrvCtrl_Execute_Trajectory.vi HolDrvCtrl_Execute.vi HolDrvCtrl_New.vi HolDrvCtrl_PackExecuteSP.vi HolDrvCtrl_PackPID.vi		Added 1/24/2022 Added 1/24/2022 Added 1/26/21 Added 1/26/21 Added 1/26/21 Added 1/26/21 Added 1/24/2022 Future	8	<i>T</i>	
HOL_DKV_CTRL	X X X X X X X X	X X X X X X X X	X X X	X X X X X X X X X X	I I SI SI		HolDrvCtrl_AdvCalculate.vi HolDrvCtrl_AtReference.vi HolDrvCtrl_Calculate_Trajectory.vi HolDrvCtrl_Calculate.vi HolDrvCtrl_Execute_Trajectory.vi HolDrvCtrl_Execute.vi HolDrvCtrl_New.vi HolDrvCtrl_PackExecuteSP.vi HolDrvCtrl_PackPID.vi HolDrvCtrl_PackProfPID.vi HolDrvCtrl_SetEnabled.vi		Added 1/24/2022 Added 1/24/2022 Added 1/26/21 Added 1/26/21 Added 1/26/21 Added 1/26/21 Added 1/24/2022 Future Added 1/26/21 Added 1/24/2022 Added 1/24/2022 Added 1/24/2022 Added 1/26/21	ŏ	L	
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HOL_DKV_CTRL	X X X X X X X X X X X X X X X X X X X	X X X X X X X X X	X X X X X	X X X X X X X X X X	SI SI SI SI	est Routine	HolDrvCtrl_AdvCalculate.vi HolDrvCtrl_AtReference.vi HolDrvCtrl_Calculate_Trajectory.vi HolDrvCtrl_Calculate.vi HolDrvCtrl_Execute_Trajectory.vi HolDrvCtrl_Execute.vi HolDrvCtrl_New.vi HolDrvCtrl_PackExecuteSP.vi HolDrvCtrl_PackPID.vi HolDrvCtrl_SetEnabled.vi HolDrvCtrl_SetTolerance.vi	Function Proteture	Added 1/24/2022 Added 1/26/21 Added 1/26/21 Added 1/26/21 Added 1/26/21 Added 1/26/21 Added 1/24/2022 Future Added 1/26/21 Added 1/24/2022 Added 1/24/2022 Added 1/24/2022 Added 1/26/21 Added 1/26/21 Added 1/26/21		est Program	rror Checking:
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PID CONTROLLER X X					PIDController_AdvCalculate_FF_Sp_Pv_Per.vi	Advanced PID			
X X	Χ	X			PIDController_AdvCalculate_FF_Sp_Pv.vi	Advanced PID			
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XX		X	SI		PIDController_AtSetpoint.vi	PID			
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XX		X	SI		PIDController DisableContinousInput.vi				
XX		X	SI		PIDController_EnableContinousInput.vi				
	Χ				X PIDController_Execute.vi	Labview style helper			
					PIDController_GetContinuousError.vi	OBSOLETE - Removed			
XX		Χ	SI		PIDController_GetPeriod.vi				
XX		Χ	SI		PIDController_GetPID.vi				
XX		X	SI		PIDController_GetPositionError.vi				
X X		X	SI		PIDController_GetSetpoint.vi				
XX		X	SI		PIDController_GetVelocityError.vi				
XX		X	SI		PIDController_IsContinuousInputEnabled.vi				
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XX		X	SI		PIDController_Pack_Tuning.vi				
XX		X	SI		PIDController Reset.vi				
XX		X	SI		PIDController_SetD.vi				
XX			SI		PIDController_SetDerivativeFilter.vi	Advanced PID			
X X	X	No			PIDController_SetFeedForward_OBSOLETE_DELETE.vi	Advanced PID, Obsolete – DELETE			
X X	X	No			PIDController_SetFFGain_OBSOLETE_DELETE.vi	Advanced PID, Obsolete – DELETE			
X X		Х	SI		PIDController Setl.vi				
					PIDController_SetInputRange.vi	OBSOLETE - Removed			
XX		Χ	SI		PIDController_SetIntegratorRange.vi				
	Χ		SI		PIDController_SetOutputLimits.vi	Advanced PID			
XX		X	SI		PIDController_SetP.vi				
X X	X	X	SI		PIDController_SetPeriod.vi				
X X	.,	X	SI		PIDController_SetPID.vi				
XX	X		SI		PIDController_SetPIDF.vi	Advanced PID			
XX		X	SI SI		PIDController_SetSetpoint.vi PIDController SetTolerance.vi				
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PROFILED PID CONTROLLER X X		Χ	SI		ProfiledPIDController_AtGoal.vi				
XX		Χ	SI		ProfiledPIDController_AtSetpoint.vi				
XX		Χ			ProfiledPIDController_Calculate_Meas_Goal.vi				
X X		X			ProfiledPIDController_Calculate_Meas_StateGoal_TrapCnsrt.vi				
XX		X			ProfiledPIDController_Calculate_Meas_StateGoal.vi				
XX		X	Ci		ProfiledPIDController_Calculate_Meas.vi				
$\begin{array}{c c} X & X \\ \hline X & X \end{array}$		X	SI SI		ProfiledPIDController_DisableContInput.vi ProfiledPIDController EnableContInput.vi				
X X X	X	X	I	+	ProfiledPIDController Execute.vi	Single call LabVIEW style function.			
					. 15.153. 12 ConditionEXCOUNT	gio san LabviLvv style fulletion.			

V	V		CI	ProfiledPIDController GetGoal.vi	
X	X	X	SI	_	
X	X	X	SI	ProfiledPIDController_GetPeriod.vi	
X	XX	X	SI	ProfiledPIDController_GetPID.vi	WPILIB has separate getters.
X	X	X	SI	ProfiledPIDController_GetPositionError.vi	
X	X	X	SI	ProfiledPIDController_GetSetpoint.vi	
X	X	X	SI	ProfiledPIDController_GetVelocityError.vi	
X	X	X	1	ProfiledPIDController_New.vi	
X	X	X	1	ProfiledPIDController_NewPeriod.vi	
X	Χ	X	SI	ProfiledPIDController_Reset_PosOnly.vi	
X	Χ	X	SI	ProfiledPIDController_Reset_PosVel.vi	
X	X	X	SI	ProfiledPIDController_Reset.vi	
X	X	X	SI	ProfiledPIDController_SetConstraints.vi	
X	X	X	SI	ProfiledPIDController_SetGoal_PosOnly.vi	
X	X	X	SI	ProfiledPIDController_SetGoal.vi	
X	X	X	SI	ProfiledPIDController_SetIntegratorRange.vi	
X	X	X	SI	ProfiledPIDController_SetPID.vi	
X	Χ	X	SI	ProfiledPIDController_SetTolerance_PosOnly.vi	
X	Χ	X	SI	ProfiledPIDController_SetTolerance_PosVel.vi	
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	Implemented	Documented	Not WPILIB	Menu Item	Execution Optim	Test Routine	Sample Progran	VI Name	Function Prototype	Notes	Code Review	Test Program	Error Checking
RAMSETE	Χ	Χ		Χ	SI			Ramsete_AtReference.vi	AtReference				
	Χ	Χ		Χ	X			Ramsete_Calculate_Trajectory.vi	calculate_trajectory				
	Χ	Χ		Χ	X			Ramsete_Calculate.vi	calculate				
	Χ	Χ	X	Χ	X			Ramsete_Diff_DO_Eng.vi					
	Χ	Χ	X	Χ	X			Ramsete_Diff_DO_SI.vi					
	Χ	Χ	X	Χ	1			Ramsete_Execute_ENG.vi	Use this one!!				
	Χ	Χ	X	Χ	SI			Ramsete_Execute_PackTuning_ENG.vi					
	Χ	Χ	Χ	Χ	SI			Ramsete_Execute_PackTuning.vi					
	Χ	Χ	X	Χ	1			Ramsete_Execute.vi					
	Χ	Χ		Χ	SI			Ramsete_New_B_Z.vi	new(b, zeta)				
	Χ	Χ		Χ	SI			Ramsete_New.vi	new				
	Χ	Χ		Χ	SI			Ramsete_SetEnabled.vi	SetEnabled				
	Χ	Χ		Χ	SI			Ramsete_SetTolerance.vi	SetTolerance				
	X	Χ		X	X			Ramsete_SINC.vi	sinc	internal			

	nplemented	ocumented	Jot WPILIB	Jenu Item	Execution Optimiz	est Routine	sample Program	VI Name	Function Prototype	Notes	Sode Review	est Program	error Checking
SIMPLE MOTOR FEEDFORWARD	×		_ <u><</u>	<u> </u>	SI	_		SimpleMotorFF_Calculate_CalcAccel.vi	unclion reductype	Notes			Щ
SIMPLE MOTORTEED GROWARD	\hat{X}	$\frac{\hat{x}}{X}$		$\frac{\lambda}{X}$	31			SimpleMotorFF Calculate NextV Dt.vi					
The state of the s	X	X		X	SI			SimpleMotorFF Calculate.vi	public double calculate(double velocity, double acceleration)				
	Χ	Χ		X	SI			SimpleMotorFF_CalculateVelocityOnly.vi	public double calculate(double velocity)				
	X	X		X	X			SimpleMotorFF_MaxAchieveAccel.vi	public double maxAchievableAcceleration(double maxVoltage, double velocity)				
	X	X		X	X			SimpleMotorFF_MaxAchieveVel.vi	public double maxAchievableVelocity(double maxVoltage, double acceleration)				
	X	X		X	X			SimpleMotorFF_MinAchieveAccel.vi	public double minAchievableAcceleration(double maxVoltage, double velocity)				
	X	X		X	X			SimpleMotorFF_MinAchieveVel.vi	public double minAchievableVelocity(double maxVoltage, double acceleration)				
	X	X		X	SI			SimpleMotorFF_New.vi	public SimpleMotorFeedforward(double ks, double kv, double ka)				
									public SimpleMotorFeedforward(double ks, double kv)				

'======== GEOMETRY '========

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documentation update.					77								
					Execution Optimized								
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	þ	g	m		Ö	e	Sample Program				×	шe	Error Checking
	Implemented	Documented	Not WPILIB	ltem	2	Test Routine	Pπ				9 <u>V</u> é	Program	၁ခု
	<i>u</i>	ше	Ϋ́	ı Ife	utic	R R	e/e				ď	Pro	5
	ple	CC	ž	Menu	eci	St	m du				Code	Test	Ď
_			≥					VI Name	Function Prototype	Notes	ပိ		<u>m</u>
COORDINATE AXIS	Χ	Χ		X	SI			CoordAxis_D.vi					
	Χ			X	SI			CoordAxis_E.vi					
	Χ	Χ		X	SI			CoordAxis_N.vi					
	Χ	Χ		X	SI			CoordAxis_New.vi					
		Χ		X	SI			CoordAxis_S.vi					
	Χ	Χ		X	SI			CoordAxis_U.vi					
	Χ	Χ		X	SI			CoordAxis_W.vi					
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	Implementea	Documentea	Vot WPILIB	Menu	Execution	Test Routine	Sample	VI Name	Function Prototype	Notes	Code	Test Program	Error Checking
COORDINATE SYSTEM	X	X	_	X	SI	X		CoordSystem_Convert_Pose3d.vi		110100			7
	X	X		X	SI			CoordSystem_Convert_Rotation3d.vi					
	X	X		X	SI			CoordSystem Convert Translation3d.vi					
	X	X		X	SI	X		CoordSystem_EDN.vi					
	X	X		X	SI	X		CoordSystem_NED.vi					
	X	×		X	SI	X		CoordSystem_New.vi					
-	X	X		X	SI	X		CoordSystem_NWU.vi					
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					nized								
					Ĭ.		am						Ø
	þ	ø	m		Optimi	æ	ogram				W	m.	king
	nted	nted	TIB	Ē	Optin	ıtine	Program				eview	gram	ecking
	mented	nented	/PILIB	Item	Optin	Routine	le Program				Review	Program	Checking
	olemented	cumented	t WPILIB	ınu Item	Optin	st Routine	mple Program				de Review	st Program	or Checking
	Implemented	Documented	Not WPILIB	Menu Item	Execution Optimi	Test Routine	Sample Program	VI Name	Function Prototype	Notes	Code Review	Test Program	Error Checking
POSE2D ∫		X Documented	Not WPILIB	Menu	Execution Optin	Test Routine	Sample		Function Prototype boolean equals(other obj)	Notes	Code Review	Test Program	Error Checking
POSE2D	Χ	Χ	Not WPILIB	X Menu	S Execution Optin	Test Routine	Sample	Pose2d_Equals.VI	boolean equals(other obj)	Notes	Code Review	Test Program	Error Checking
POSE2D	X	X	Not WPILIB	X Menu	X So Execution Optin	Test Routine	Sample	Pose2d_Equals.VI Pose2d Exp.vi	boolean equals(other obj) pose2d exp(twist2d twist)		Code Review	Test Program	Error Checking
POSE2D	X X X	X X X	Not WPILIB	X Wenu	ত X ত Execution Optin	Test Routine	Sample	Pose2d_Equals.VI Pose2d_Exp.vi Pose2d_getRotation.vi	boolean equals(other obj) pose2d exp(twist2d twist) rotation2d getRotation()	can also use cluster unpack	Code Review	Test Program	Error Checking
POSE2D	X X X X	X X X X	X	X X X	S S Execution Optin	Test Routine	Sample	Pose2d_Equals.VI Pose2d_Exp.vi Pose2d_getRotation.vi Pose2d_getTranslation.vi	boolean equals(other obj) pose2d exp(twist2d twist)		Code Review	Test Program	Error Checking
POSE2D	X X X X	X X X X	X	X X X	S S Execution Optin	Test Routine	Sample	Pose2d_Equals.VI Pose2d_Exp.vi Pose2d_getRotation.vi Pose2d_getTranslation.vi Pose2d_getXY.vi	boolean equals(other obj) pose2d exp(twist2d twist) rotation2d getRotation()	can also use cluster unpack	Code Review	Test Program	Error Checking
POSE2D	X X X X	X X X X	X	X X X	S S Execution Optin	Test Routine	Sample	Pose2d_Equals.VI Pose2d_Exp.vi Pose2d_getRotation.vi Pose2d_getTranslation.vi Pose2d_getXY.vi Pose2d_getXYAngle.vi	boolean equals(other obj) pose2d exp(twist2d twist) rotation2d getRotation()	can also use cluster unpack	Code Review	Test Program	Error Checking
POSE2D	X X X X	X X X X	X	X X X	S S Execution Optin	Test Routine	Sample	Pose2d_Equals.VI Pose2d_Exp.vi Pose2d_getRotation.vi Pose2d_getTranslation.vi Pose2d_getXY.vi Pose2d_getXYAngle.vi Pose2d_Interpolate.vi	boolean equals(other obj) pose2d exp(twist2d twist) rotation2d getRotation() translation2d getTranslation()	can also use cluster unpack	Code Review	Test Program	Error Checking
POSE2D	X X X X X X X	X X X X X X	X	X X X X X X X X X X X X X X X X X X X	IS IS Execution Optin	Test Routine	Sample	Pose2d_Equals.VI Pose2d_Exp.vi Pose2d_getRotation.vi Pose2d_getTranslation.vi Pose2d_getXY.vi Pose2d_getXYAngle.vi Pose2d_Interpolate.vi Pose2d_Log.vi	boolean equals(other obj) pose2d exp(twist2d twist) rotation2d getRotation() translation2d getTranslation() twist2d log(pose2d end)	can also use cluster unpack	Code Review	Test Program	Error Checking
POSE2D	X X X X X X X X	X X X X X X X	X	X X X X X X	IS IS Execution Optin	Test Routine	Sample	Pose2d_Equals.VI Pose2d_Exp.vi Pose2d_getRotation.vi Pose2d_getTranslation.vi Pose2d_getXY.vi Pose2d_getXYAngle.vi Pose2d_Interpolate.vi Pose2d_Log.vi Pose2d_Minus.vi	boolean equals(other obj) pose2d exp(twist2d twist) rotation2d getRotation() translation2d getTranslation() twist2d log(pose2d end) transform2d minus(pose2d other)	can also use cluster unpack	Code Review	Test Program	Error Checking
POSE2D	X X X X X X X X X	X X X X X X X X X	X	X X X X X X X X X X X X X X X X X X X	IS I	Test Routine	Sample	Pose2d_Equals.VI Pose2d_Exp.vi Pose2d_getRotation.vi Pose2d_getTranslation.vi Pose2d_getXY.vi Pose2d_getXYAngle.vi Pose2d_Interpolate.vi Pose2d_Log.vi Pose2d_Minus.vi Pose2d_New_TRRO.vi	boolean equals(other obj) pose2d exp(twist2d twist) rotation2d getRotation() translation2d getTranslation() twist2d log(pose2d end) transform2d minus(pose2d other) pose2d new(translation2d, rotation2d)	can also use cluster unpack	Code Review	Test Program	Error Checking
POSE2D	X X X X X X X X X X	X X X X X X X X X	X	X X X X X X X	IS I	Test Routine	Sample	Pose2d_Equals.VI Pose2d_Exp.vi Pose2d_getRotation.vi Pose2d_getTranslation.vi Pose2d_getXY.vi Pose2d_getXYAngle.vi Pose2d_Interpolate.vi Pose2d_Log.vi Pose2d_Minus.vi Pose2d_New_TRRO.vi Pose2d_New.vi	boolean equals(other obj) pose2d exp(twist2d twist) rotation2d getRotation() translation2d getTranslation() twist2d log(pose2d end) transform2d minus(pose2d other) pose2d new(translation2d, rotation2d) pose2d new(double x, double y, rotation2d)	can also use cluster unpack	Code Review	Test Program	Error Checking
POSE2D	X X X X X X X X X X X X X X X X X X X	X X X X X X X X X X	X	X	SI S	Test Routine	Sample	Pose2d_Equals.VI Pose2d_Exp.vi Pose2d_getRotation.vi Pose2d_getTranslation.vi Pose2d_getXY.vi Pose2d_getXYAngle.vi Pose2d_Interpolate.vi Pose2d_Log.vi Pose2d_Minus.vi Pose2d_New_TRRO.vi Pose2d_New.vi Pose2d_Plus.vi	boolean equals(other obj) pose2d exp(twist2d twist) rotation2d getRotation() translation2d getTranslation() twist2d log(pose2d end) transform2d minus(pose2d other) pose2d new(translation2d, rotation2d) pose2d new(double x, double y, rotation2d) pose2d plus(transform2d other)	can also use cluster unpack	Code Review	Test Program	Error Checking
POSE2D	X X X X X X X X X X X X X X X X X X X	X X X X X X X X X X X	X	X	SI S	Test Routine	Sample	Pose2d_Equals.VI Pose2d_Exp.vi Pose2d_getRotation.vi Pose2d_getTranslation.vi Pose2d_getXY.vi Pose2d_getXYAngle.vi Pose2d_Interpolate.vi Pose2d_Log.vi Pose2d_Minus.vi Pose2d_New_TRRO.vi Pose2d_New.vi Pose2d_Plus.vi Pose2d_RelativeTo.vi	boolean equals(other obj) pose2d exp(twist2d twist) rotation2d getRotation() translation2d getTranslation() twist2d log(pose2d end) transform2d minus(pose2d other) pose2d new(translation2d, rotation2d) pose2d new(double x, double y, rotation2d) pose2d plus(transform2d other) pose2d relativeto(pose2d other)	can also use cluster unpack	Code Review	Test Program	Error Checking
POSE2D	X X X X X X X X X X X X X X X X X X X	X X X X X X X X X X X	X	X	SI S	Test Routine	Sample	Pose2d_Equals.VI Pose2d_Exp.vi Pose2d_getRotation.vi Pose2d_getTranslation.vi Pose2d_getXY.vi Pose2d_getXYAngle.vi Pose2d_Interpolate.vi Pose2d_Log.vi Pose2d_Minus.vi Pose2d_New_TRRO.vi Pose2d_New.vi Pose2d_Plus.vi	boolean equals(other obj) pose2d exp(twist2d twist) rotation2d getRotation() translation2d getTranslation() twist2d log(pose2d end) transform2d minus(pose2d other) pose2d new(translation2d, rotation2d) pose2d new(double x, double y, rotation2d) pose2d plus(transform2d other) pose2d relativeto(pose2d other) pose2d transformby(transform2d other)	can also use cluster unpack can also use cluster unpack	Code Review	Test Program	Error Checking
POSE2D	X X X X X X X X X X X X X X X X X X X	X X X X X X X X X X X	X	X	SI S	Test Routine	Sample	Pose2d_Equals.VI Pose2d_Exp.vi Pose2d_getRotation.vi Pose2d_getTranslation.vi Pose2d_getXY.vi Pose2d_getXYAngle.vi Pose2d_Interpolate.vi Pose2d_Log.vi Pose2d_Minus.vi Pose2d_New_TRRO.vi Pose2d_New.vi Pose2d_Plus.vi Pose2d_RelativeTo.vi	boolean equals(other obj) pose2d exp(twist2d twist) rotation2d getRotation() translation2d getTranslation() twist2d log(pose2d end) transform2d minus(pose2d other) pose2d new(translation2d, rotation2d) pose2d new(double x, double y, rotation2d) pose2d plus(transform2d other) pose2d relativeto(pose2d other)	can also use cluster unpack	Code Review	Test Program	Error Checking
POSE2D	X X X X X X X X X X X X X X X X X X X	X X X X X X X X X X X	X	X	SI S	Test Routine	Sample	Pose2d_Equals.VI Pose2d_Exp.vi Pose2d_getRotation.vi Pose2d_getTranslation.vi Pose2d_getXY.vi Pose2d_getXYAngle.vi Pose2d_Interpolate.vi Pose2d_Log.vi Pose2d_Minus.vi Pose2d_New_TRRO.vi Pose2d_New.vi Pose2d_Plus.vi Pose2d_RelativeTo.vi	boolean equals(other obj) pose2d exp(twist2d twist) rotation2d getRotation() translation2d getTranslation() twist2d log(pose2d end) transform2d minus(pose2d other) pose2d new(translation2d, rotation2d) pose2d new(double x, double y, rotation2d) pose2d plus(transform2d other) pose2d relativeto(pose2d other) pose2d transformby(transform2d other)	can also use cluster unpack can also use cluster unpack	Code Review	Test Program	Error Checking
POSE2D	X X X X X X X X X X X X X X X X X X X	X X X X X X X X X X X	X	X	SI S	Test Routine	Sample	Pose2d_Equals.VI Pose2d_Exp.vi Pose2d_getRotation.vi Pose2d_getTranslation.vi Pose2d_getXY.vi Pose2d_getXYAngle.vi Pose2d_Interpolate.vi Pose2d_Log.vi Pose2d_Minus.vi Pose2d_New_TRRO.vi Pose2d_New.vi Pose2d_Plus.vi Pose2d_RelativeTo.vi	boolean equals(other obj) pose2d exp(twist2d twist) rotation2d getRotation() translation2d getTranslation() twist2d log(pose2d end) transform2d minus(pose2d other) pose2d new(translation2d, rotation2d) pose2d new(double x, double y, rotation2d) pose2d plus(transform2d other) pose2d relativeto(pose2d other) pose2d transformby(transform2d other)	can also use cluster unpack can also use cluster unpack	Code Review	Test Program	Error Checking
POSE2D	X X X X X X X X X X X X X X X X X X X	X X X X X X X X X X X	X	X	SI S	Test Routine	Sample	Pose2d_Equals.VI Pose2d_Exp.vi Pose2d_getRotation.vi Pose2d_getTranslation.vi Pose2d_getXY.vi Pose2d_getXYAngle.vi Pose2d_Interpolate.vi Pose2d_Log.vi Pose2d_Minus.vi Pose2d_New_TRRO.vi Pose2d_New.vi Pose2d_Plus.vi Pose2d_RelativeTo.vi	boolean equals(other obj) pose2d exp(twist2d twist) rotation2d getRotation() translation2d getTranslation() twist2d log(pose2d end) transform2d minus(pose2d other) pose2d new(translation2d, rotation2d) pose2d new(double x, double y, rotation2d) pose2d plus(transform2d other) pose2d relativeto(pose2d other) pose2d transformby(transform2d other)	can also use cluster unpack can also use cluster unpack	Code Review	Test Program	
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POSE2D	X X X X X X X X X X X X X X X X X X X	X X X X X X X X X X X X X X X X X X X	XXX	X X X X X X X X X	SI S		Program	Pose2d_Equals.VI Pose2d_Exp.vi Pose2d_getRotation.vi Pose2d_getTranslation.vi Pose2d_getXY.vi Pose2d_getXYAngle.vi Pose2d_Interpolate.vi Pose2d_Log.vi Pose2d_Minus.vi Pose2d_New_TRRO.vi Pose2d_New.vi Pose2d_Plus.vi Pose2d_RelativeTo.vi	boolean equals(other obj) pose2d exp(twist2d twist) rotation2d getRotation() translation2d getTranslation() twist2d log(pose2d end) transform2d minus(pose2d other) pose2d new(translation2d, rotation2d) pose2d new(double x, double y, rotation2d) pose2d plus(transform2d other) pose2d relativeto(pose2d other) pose2d transformby(transform2d other)	can also use cluster unpack can also use cluster unpack	Review	Program	
POSE2D	X X X X X X X X X X X X X X X X X X X	X X X X X X X X X X X X X X X X X X X	X	X X X X X X X X X	SI S		Program	Pose2d_Equals.VI Pose2d_Exp.vi Pose2d_getRotation.vi Pose2d_getTranslation.vi Pose2d_getXY.vi Pose2d_getXYAngle.vi Pose2d_Interpolate.vi Pose2d_Log.vi Pose2d_Minus.vi Pose2d_New_TRRO.vi Pose2d_New.vi Pose2d_Plus.vi Pose2d_Plus.vi Pose2d_RelativeTo.vi Pose2d_TransformBy.vi	boolean equals(other obj) pose2d exp(twist2d twist) rotation2d getRotation() translation2d getTranslation() twist2d log(pose2d end) transform2d minus(pose2d other) pose2d new(translation2d, rotation2d) pose2d new(double x, double y, rotation2d) pose2d plus(transform2d other) pose2d relativeto(pose2d other) pose2d transformby(transform2d other) pose2d new()	can also use cluster unpack can also use cluster unpack can use cluster unpack can use cluster unpack	Review	Program	
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POSE2D POSE3D	X X X X X X X X X X X X X X X X X X X	X X X X X X X X X X X X X X X X X X X	XXX	X X X X X X X X X X X X X X X X X X X	S S S S S S S S S S		Sample Program Sample	Pose2d_Equals.VI Pose2d_Exp.vi Pose2d_getRotation.vi Pose2d_getTranslation.vi Pose2d_getXY.vi Pose2d_getXYAngle.vi Pose2d_Interpolate.vi Pose2d_Log.vi Pose2d_Minus.vi Pose2d_New_TRRO.vi Pose2d_New.vi Pose2d_Plus.vi Pose2d_Plus.vi Pose2d_RelativeTo.vi Pose2d_TransformBy.vi	boolean equals(other obj) pose2d exp(twist2d twist) rotation2d getRotation() translation2d getTranslation() twist2d log(pose2d end) transform2d minus(pose2d other) pose2d new(translation2d, rotation2d) pose2d new(double x, double y, rotation2d) pose2d plus(transform2d other) pose2d relativeto(pose2d other) pose2d transformby(transform2d other) pose2d new()	can also use cluster unpack can also use cluster unpack can use cluster unpack can use cluster unpack	Review	Program	
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X	Χ	Χ	Χ	Pose3d_Log.vi
X	Χ	Χ	SI	Pose3d_Minus.vi
X	Χ	Χ	SI	Pose3d_New.vi
X	Χ	Χ	SI	Pose3d_New_Default.vi Pose3d_New_Trans3dRot3d.vi
X	Χ	Χ	SI	Pose3d_New_Trans3dRot3d.vi
X	Χ	Χ	SI	Pose3d_Plus.vi
X	Χ	X	SI	Pose3d_RelativeTo.vi
X	Χ	No	SI	Pose3d_RotationVectorToMatrix.vi
X	Χ	Χ	SI	Pose3d_ToPose2d.vi
X	Χ	Χ	SI	Pose3d_TransformBy.vi

	Implemented	Documented	Not WPILIB	Menu Item	Execution Optimized	Test Routine		Function Prototype	Notes	Code Review	Test Program	Error Checking
QUATERNION	X	X		X	SI		Quaternion_Equals.vi					
	X	X		Χ	SI		Quaternion_Get_All.vi					
	Χ	X		Χ	SI		Quaternion_Get_LVQuat.vi					
	X	X		Χ	SI		Quaternion_Get_Vect.vi					
	Χ	X		Χ	SI		Quaternion_Get_W.vi					
	X	X		Χ	SI		Quaternion_Inverse.vi					
	X	X		Χ	SI		Quaternion_New.vi					
	X	X		X	SI		Quaternion_New_Default.vi					
	X	X		Χ	SI		Quaternion_New_LVQuat.vi					
	X	X		Χ	SI		Quaternion_Normalize.vi					
	X	Χ		X	SI		Quaternion_Plus.vi					
	Χ	Χ		Χ	SI		Quaternion_Times.vi	<u> </u>				
	Χ	X		Χ	SI		Quaternion_ToRotationVector.vi					

	Implemented	Documented	Not WPILIB	Menu Item	Execution Optimized	Test Routine	Sample Program	Function Prototype	Notes	Code Review	Test Program	Error Checking
ROTATION2D	X	Χ		Χ	SI		Rotation2d_CreateAngle.vi	rotation2d new(double value)				
	X	Χ		Χ	SI		Rotation2d_CreateAngleDegrees.vi	rotation2d fromDegrees(double degrees)	convert to radians then create			
	X	Χ		Χ	SI		Rotation2d_CreateAngleRotations.vi					
	Χ	Χ		X	SI		Rotation2d_CreateXY.vi	rotation2d new(double x, double y)				
	X	Χ		Χ	SI		Rotation2d_Equals.vi	boolean equals(rotation2d other)				
	X	Χ	Χ	Χ	SI		Rotation2d_GetAngleCosSin.vi		New 1/26/21			
	X	Χ		Χ	SI		Rotation2d_GetCos.VI	double getCos()	use cluster unpack			
	X	X		X	SI		Rotation2d_GetDegrees.VI	double getDegrees()	use cluster unpack, then convert to degree			
	X	Χ		Χ	SI		Rotation2d_GetRadians.VI	double getRadians()	use cluster unpack			
	X	Χ		Χ	SI		Rotation2d_GetRotations.vi					
	X	Χ		Χ	SI		Rotation2d_GetSin.VI	double getSin()	use cluster unpack			
	X	Χ		Χ	SI		Rotation2d_GetTan.VI	double getTan()	can calculate			
	X	Χ		Χ	SI		Rotation2d_Interpolate.vi					
	X	Χ		Χ	SI		Rotation2d_Minus.vi	rotation2d minus(rotation2d other)				
	X	Χ		Χ	SI		Rotation2d_Plus.vi	rotation2d plus(rotation2d other)				
	X	Χ		Χ	SI		Rotation2d_RotateBy.vi	rotation2d rotateby(rotation2d other)				
	X	Χ		Χ	SI		Rotation2d_Times.vi	rotation2d times(double scalar)				
	X	Χ		Χ	SI		Rotation2d_UnaryMinus.vi	rotation2d unaryminus()				
								rotation2d new()	can use cluster constant			

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	Implemented	Documented	Not WPILIB	Menu Item	Execution Optimized	Test Routine	Sample Program	VI Name	Function Prototype	Notes	Code Review	Test Program	Error Checking
ROTATION3D	X	X	$\overline{}$	\overline{X}	SI			Rotation3d_Create_AxisAngle.vi					
	X	X	$\overline{}$	X	SI	$\overline{}$		Rotation3d_Create_Default.vi					
	X	X		X	SI	-	\neg	Rotation3d Create Quaternion.vi					
	X	X		X	SI			Rotation3d_Create_RollPitchYaw.vi					
	Χ	Χ		Χ	SI			Rotation3d_Equals.vi					
	Χ	Χ	X	Χ	SI			Rotation3d_GetAxisAngle.vi					
	Χ	Χ		Χ	SI			Rotation3d_GetQuaternion.vi					
	Χ	Χ		Χ	SI			Rotation3d_GetXYZ.vi					
	Χ	Χ		Χ	SI			Rotation3d_Interpolate.vi					
	Χ	Χ		Χ	SI			Rotation3d_Minus.vi					
	Χ	Χ		Χ	SI			Rotation3d_Plus.vi					
	Χ	Χ		Χ	SI	\longrightarrow		Rotation3d_RotateBy.vi					
	X	X		X	SI	\rightarrow		Rotation3d_Times.vi					
	Χ	X		X		\longrightarrow		Rotation3d_ToRotation2d.vi					
	Χ	X	\longrightarrow	X	SI	\rightarrow		Rotation3d_UnaryMinus.vi					
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TRANSFORM2D	X X Implemented	X X X X X X X X X X X X X X X X X X X	X Not WPILIB	X X X X X X X X X X X X X X X X X X X	ଓ ଓ ଓ ଓ Execution Optimized	Test Routine		VI Name Transform2d_Create_PosePose.vi Transform2d_Create_TransRot.vi Transform2d_Equals.VI Transform2d_GetRotation.VI Transform2d_GetTranslation.VI	Function Prototype transform2d new(pose2d, pose2d) transform2d new(translation2d, rotation2d) boolean equals(other transform2d) rotation2d getRotation() translation2d getTranslation()	Notes use cluster unpack use cluster unpack	Code Review	Test Program	Error Checking
	X X X	X X X	X	X X X	SI SI Si SI			Transform2d_GetXY.vi Transform2d_GetXYAngle.vi Transform2d_Inverse.vi Transform2d_Plus.vi Transform2d_Times.vi	transform inverse() transform2d times(double scalar) transform2d new()	new can use cluster constant			
TRANSFORM3D	Implemented X X	X X X	Not WPILIB	X X X	Execution Optimized 19 19 19	Test Routine	Sample Program	Transform2d_GetXYAngle.vi Transform2d_Inverse.vi Transform2d_Plus.vi Transform2d_Times.vi	transform2d times(double scalar)	new	Code Review	Test Program	Error Checking
TRANSFORM3D	X X Implemented	X Documented		X Wenu Item	S Execution Optimized	Test Routine	Sample Program	Transform2d_GetXYAngle.vi Transform2d_Inverse.vi Transform2d_Plus.vi Transform2d_Times.vi VI Name Transform3d_Create_Default.vi	transform2d times(double scalar) transform2d new()	new can use cluster constant	Code Review	Test Program	Error Checking
TRANSFORM3D	X X Implemented	X X Documented		X X X X X X	9 19 Execution Optimized	Test Routine	Sample Program	Transform2d_GetXYAngle.vi Transform2d_Inverse.vi Transform2d_Plus.vi Transform2d_Times.vi VI Name Transform3d_Create_Default.vi Transform3d_Create_Pose3dPose.3dvi	transform2d times(double scalar) transform2d new()	new can use cluster constant	Code Review	Test Program	Error Checking
TRANSFORM3D	X X Implemented	X Documented		X X X X X X	S Execution Optimized	Test Routine	Sample Program	Transform2d_GetXYAngle.vi Transform2d_Inverse.vi Transform2d_Plus.vi Transform2d_Times.vi VI Name Transform3d_Create_Default.vi	transform2d times(double scalar) transform2d new()	new can use cluster constant	Code Review	Test Program	Error Checking
TRANSFORM3D	X X Implemented	X X X X X		X X X X X X X X X X X X X X X X X X X	19 19 Execution Optimized 19 19 19	Test Routine	Sample Program	Transform2d_GetXYAngle.vi Transform2d_Inverse.vi Transform2d_Plus.vi Transform2d_Times.vi VI Name Transform3d_Create_Default.vi Transform3d_Create_Pose3dPose.3dvi Transform3d_Create_Trans3dRot3d.vi	transform2d times(double scalar) transform2d new()	new can use cluster constant	Code Review	Test Program	Error Checking
TRANSFORM3D	X X X X X X X X X X X X X X X X X X X	X X X X X X X	Not WPILIB	X X X X X X X X X X X X X X X X X X X		Test Routine	Sample Program	Transform2d_GetXYAngle.vi Transform2d_Inverse.vi Transform2d_Plus.vi Transform2d_Times.vi VI Name Transform3d_Create_Default.vi Transform3d_Create_Pose3dPose.3dvi Transform3d_Create_Trans3dRot3d.vi Transform3d_Equals.VI	transform2d times(double scalar) transform2d new()	new can use cluster constant	Code Review	Test Program	Error Checking
TRANSFORM3D	X X X X X X X X X X X X X X X X X X X	X X X X X X X X X X X X X X X X X X X	Not WPILIB	X X X X X X X X X X X X X X X X X X X	19 19 19 Execution Optimized 19 19 19 19	Test Routine	Sample Program	Transform2d_GetXYAngle.vi Transform2d_Inverse.vi Transform2d_Plus.vi Transform2d_Times.vi VI Name Transform3d_Create_Default.vi Transform3d_Create_Pose3dPose.3dvi Transform3d_Create_Trans3dRot3d.vi Transform3d_GetRotation3d.VI Transform3d_GetRotation3d.VI Transform3d_GetXYZ.vi	transform2d times(double scalar) transform2d new()	new can use cluster constant	Code Review	Test Program	Error Checking
TRANSFORM3D	X X X X X X X X X X X X X X X X X X X	X X X X X X X X X X X X X X X X X X X	Not WPILIB	X X X X X X X X X X X X X X X X X X X		Test Routine	Sample Program	Transform2d_GetXYAngle.vi Transform2d_Inverse.vi Transform2d_Plus.vi Transform2d_Times.vi VI Name Transform3d_Create_Default.vi Transform3d_Create_Pose3dPose.3dvi Transform3d_Create_Trans3dRot3d.vi Transform3d_Equals.VI Transform3d_GetRotation3d.VI Transform3d_GetTranslation3d.VI Transform3d_GetXYZ.vi Transform3d_Inverse.vi	transform2d times(double scalar) transform2d new()	new can use cluster constant	Code Review	Test Program	Error Checking
TRANSFORM3D	X X X Implemented X X X	X X X X X X X X X X X X X X X X X X X	Not WPILIB	X X X X X X X X X X X X X X X X X X X	10 10 10 10 10 10 10 10	Test Routine	Sample Program	Transform2d_GetXYAngle.vi Transform2d_Inverse.vi Transform2d_Plus.vi Transform2d_Times.vi VI Name Transform3d_Create_Default.vi Transform3d_Create_Pose3dPose.3dvi Transform3d_Create_Trans3dRot3d.vi Transform3d_GetRotation3d.VI Transform3d_GetRotation3d.VI Transform3d_GetXYZ.vi Transform3d_Inverse.vi Transform3d_Plus.vi	transform2d times(double scalar) transform2d new()	new can use cluster constant	Code Review	Test Program	Error Checking
TRANSFORM3D	X X X X X X X X X X X X X X X X X X X	X X X X X X X X X X X X X X X X X X X	Not WPILIB	X X X X X X X X X X X X X X X X X X X	10 10 10 10 10 10 10 10	Test Routine	Sample Program	Transform2d_GetXYAngle.vi Transform2d_Inverse.vi Transform2d_Plus.vi Transform2d_Times.vi VI Name Transform3d_Create_Default.vi Transform3d_Create_Pose3dPose.3dvi Transform3d_Create_Trans3dRot3d.vi Transform3d_Equals.VI Transform3d_GetRotation3d.VI Transform3d_GetTranslation3d.VI Transform3d_GetXYZ.vi Transform3d_Inverse.vi	transform2d times(double scalar) transform2d new()	new can use cluster constant	Code Review	Test Program	Error Checking

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TRANSLATION2D		X		X	SI			Translation2d_Create_DistAng.vi					
		X		Χ	SI			Translation2d_Create.vi	translation2d new(double x, double y)				
	X	X		Χ	SI			Translation2d_Equals.vi	boolean equals(translation other)				
		Χ		Χ	SI			Translation2d_GetAngle.vi					
		X		Χ	SI			Translation2d_GetDistance.vi	double getDistance(translation2d other)				
		X		Χ	SI			Translation2d_GetNorm.VI	double getNorm()	can use cluster unpack			
		X	_	Χ	SI			Translation2d_GetX.VI	double getX()	can use cluster unpack			
			X	Χ	SI			Translation2d_GetXY.VI					
		X		Χ	SI			Translation2d_GetY.VI	double getY()	can use cluster unpack			
		X		Χ	SI			Translation2d_Interpolate.vi					
		X		X	SI			Translation2d_Minus.vi	translation2d minus(translation2d other)				
		X		Χ	SI			Translation2d_Plus.vi	translation2d plus(translation2d other)				
	X	X		Χ	SI			Translation2d_RotateBy.vi	translation2d rotateBy(rotation2d other)				
		X		X	SI			Translation2d_Times.vi	translation2d times(double scalar)				
	X	X		Χ	SI			Translation2d_UnaryMinus.vi	translation2d unaryminus()				
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TRANSLATION3D		\overline{X}	$\overline{}$	\overline{X}	SI	Ι.	Τ,	Translation3d Create.vi					
		X		X	SI			Translation3d Create Default.vi					
		X		Χ	SI			Translation3d_Create_DistAng.vi					
		X		Χ	SI			Translation3d Div.vi					
		X		X	SI			Translation3d_Equals.vi					
		X		X	SI			Translation3d_GetDistance.vi					
		X		X	SI			Translation3d GetNorm.VI					
			X	X	SI			Translation3d GetXYZ.vi					
		X		X	SI			Translation3d_Interpolate.vi					
		X		X	SI			Translation3d Minus.vi					
		X		X	SI			Translation3d Plus.vi					
		X		X	SI			Translation3d_RotateBy.vi					
		X	\dashv	X	SI		1	Translation3d Times.vi					
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TWIST2D		X		X	SI	1		Twist2d_Create.vi	twist new(x, y, theta)				
		X		Χ	SI			Twist2d_Equals.VI	boolean equals(obj other)				
	X	X	X	Χ	SI			Twist2d_GetAll.VI					
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CHASSIS SPEEDS	X	X	X	SI		ChassisSpeeds_FromFieldRelativeSpeeds.VI	chassisspeeds fromFieldRelativeSpeeds(double x, double y,				
_	X	<u> </u>	(X	SI		ChassisSPeeds GetXYOmega.vi	double angvel, rotation2d robotangle)				
	X	X	X			ChassisSpeeds_GetX1Omega.vi ChassisSpeeds_New.vi	chassisspeeds new (double xvel, double yvel, double angvel)				
	,	,	7.	U,		onaccioopecas_rrem.rr	chassisspeeds new ()	can use cluster constant			
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	Ď	~ ¢		Opti	Θ				M	E E	ecking
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	~	0 0	Menu Item	ž.	Test Routine	VI Name	Function Prototype	Notes	Code	Test Progr	Error
DIFFERENTIAL DRIVE KINEMATICS		<u>Q</u> ≥	: <u>≥</u> X	<u> </u>	X	DiffKinematics New.vi	diffDriveKine new(double trackWidth)	Notes			Щ
		X	X		X	DiffKinematics_toChassisSpeed.vi	chassisSpeeds toChassisSpeeds(diffDrWheelSpeeds)				
		X	X		X	DiffKinematics_toWheelSpeed.vi	diffDriveWheelSpeed toWheelSpeeds(chassisSpeeds)				
									'		
				pəz							
				imi							50
	<i>p</i> ₆	m Ø	,	Dpt	Эе				Ø	am	king
	ent	ente	i ii	00	Routine				Review	ogr	hec
	plemente	umente	Aenu Iten	ecution	λ. Έ	VI Name			.e Z	ď	Õ
	пр	Dog Not	Jel Jel	ě	rest	VI Name	Function Prototype	Notes	Code	Test	Error
DIFFERENTIAL DRIVE ODOMETRY		$\frac{1}{X}$		Τ "		DiffOdometry Execute.vi	T unition i relotype	DONT NEED			
	Χ	X	X	Χ		DiffOdometry_Update.vi	pose2d update(rotation2d gyro, double leftdist, double right dist)				
							I'MD O I				
							diffDrOdom new(rotation gyro, pose initial) diffDrOdom new(rotation gyro)				
							void resetPosition(pose2d, rotation2d)	incorporated into "update"	+		
							pose2d getPoseMeters()	incorporated into apadic			
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	Пр	oc j	Jel Jel	ĕ	Test	VI Name	Function Prototype	Notes	ро	<i>Test</i>	ori:
DIFFERENTIAL DRIVE WHEEL SPEEDS		<u> </u>		T 4		y vivanic	diffDrWheelSpeeds new()	Notes	T		
							diffDrWheelSpeeds new(double leftVel, double rightVel)				
	Χ	X	X	X		DiffWheel_Normalize.vi	void normalize(double maxVel)				
				7-							
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				timi						_	ğ
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	ieni	ent	ir. tem	ion	itno				Revi	160	hec
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MECANUM DRIVE KINEMATICS	Χ	X	X	I <u>Ü</u>	St.	MecaKinematics_New.vi	Function Prototype	Notes	Code	Test	Error
MECANUM DRIVE KINEMATICS		X		I <u>Ü</u>	St.		Function Prototype	Notes	Code	Test	Ern

24/2022 – After documentation update.			_								-	
X	X		X	X			MecaKinematics_ToChassisSpeeds.vi					
X	X		X	X			MecaKinematics_ToWheelSpeeds.vi					
X	X		X	X			MecaKinematics_ToWheelSpeedsZeroCenter.vi					
				75								
MECANUM DRIVE MOTOR VOLTAGE nothing		Not WPILIB	Menu Item	Execution Optimized	Test Routine	Sample Program	VI Name	Function Prototype	Notes	Code Review	Test Program	Error Checking
Hothing	uone											
MECANUM DRIVE ODOMETRY X	X	X X Not WPILIB		X Execution Optimized	Test Routine		VI Name MecaOdometry_Execute.vi MecaOdometry_GetKinematics.vi	Function Prototype	Notes	Code Review	Test Program	Error Checking
X	X		X				MecaOdometry_GetPose.vi MecaOdometry_New.vi					
X			X				MecaOdometry_NewDefaultPose.vi					
X			X				MecaOdometry Reset.VI					
X			X		+		MecaOdometry_Reset.vi MecaOdometry_Update.vi		+			
$\frac{X}{X}$			X				MecaOdometry_Update.vi MecaOdometry_UpdateWithTime.vi		+			
X							incoa domeny_opuatevniin nine.vi					
MECANUM DRIVE WHEEL SPEEDS X	X	X Not WPILIB	X Menu Item	X ≤ Execution Optim	Test Routine		VI Name MecaWheel_New.Vi MecaWheel_GetAll.vi MecaWheel_Normalize.vi	Function Prototype public MecanumDriveWheelSpeeds(double frontLeftMetersPerSecond, double frontRightMetersPerSecond, double rearLeftMetersPerSecond, double rearRightMetersPerSecond) public void normalize(double	Notes	Code Review	Test Program	Error Checking
								attainableMaxSpeedMetersPerSecond)				
Implemented		Not WPILIB	Menu Item	Execution Optimized	Test Routine		VI Name	Function Prototype	Notes	Code Review	Test Program	Error Checking
SWERVE DRIVE KINEMATICS X	X	X					SwerveKinematics_New4.VI		For 4 module drives			
X	X	X	X				SwerveKinematics_NewX.VI		uses array as input			
X	X	X	X				SwerveKinematics_NormalizeWheelSpeeds.vi	public static void normalizeWheelSpeeds(SwerveModuleState[]				
	V	\ \\ \\ \\ \\	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	-	-		Sworyakinamatica TaChassisSpanda4\//	moduleStates, double attainableMaxSpeedMetersPerSecond)	For 4 modulo drives			
$\begin{array}{ c c c c }\hline X \\ \hline X \\ \end{array}$		X	X	-			SwerveKinematics_ToChassisSpeeds4.VI SwerveKinematics_ToChassisSpeedsX.VI		For 4 module drives			
X	X	^	X				SwerveKinematics_ToSwerveModuleStates.VI	public SwerveModuleState[] toSwerveModuleStates(ChassisSpeeds chassisSpeeds, Translation2d centerOfRotationMeters)	uses array as input			
X	X		X				SwerveKinematics_ToSwerveModuleStatesZeroCenter.VI	public SwerveModuleState[] toSwerveModuleStates(ChassisSpeeds chassisSpeeds) public SwerveDriveKinematics(Translation2d wheelsMeters)	variable parameters (replace with array and "4" calls)			
								public ChassisSpeeds toChassisSpeeds(SwerveModuleState wheelStates)	variable parameters (replace with array and "4" calls)			

Revision 2.X 5/24/2022 - After documentation update Execution Optimized Routine Jenu Item Function Prototype Notes SWERVE DRIVE ODOMETRY SwerveOdometry Execute4.vi SwerveOdometry_ExecuteX.vi X X X SwerveOdometry GetPosition.VI public Pose2d getPoseMeters() X X X SwerveOdometry_New.VI public SwerveDriveOdometry(SwerveDriveKinematics kinematics, Rotation2d gyroAngle, Pose2d initialPose) X Χ SwerveOdometry NewZeroCenter.VI public SwerveDriveOdometry(SwerveDriveKinematics kinematics, Rotation2d gyroAngle) public void resetPosition(Pose2d pose, Rotation2d gyroAngle) XX Χ SwerveOdometry ResetPosition.VI X X X X SwerveOdometry_Update4.VI For 4 module drives X X X SwerveOdometry_UpdateWithTime4.VI For 4 module drives X X X SwerveOdometry_UpdateWithTimeX.VI uses array as input X X X X SwerveOdometry UpdateX.VI uses array as input public Pose2d updateWithTime(double currentTimeSeconds, variable parameters (replace with Rotation2d gyroAngle, SwerveModuleState... moduleStates) array and "4" calls) variable parameters (replace with public Pose2d update(Rotation2d gyroAngle, SwerveModuleState... moduleStates) array and "4" calls) Vot WPILIB Routin Menu Item Function Prototype Notes SWERVE DRIVE MODULE STATE X SwerveModuleState CompareTo.vi X X SI public int compareTo(SwerveModuleState o) X SI SwerveModuleState Get.vi XX X Χ Χ SI SwerveModuleState New.vi public SwerveModuleState(double speedMetersPerSecond, Rotation2d angle) X X Χ SI SwerveModuleState Optimize.vi public SwerveModuleState optimize(SwerveModuleState desired, Rotation2d angle) '======== SPLINE '======== lenu Item VI Name Function Prototype Notes **CUBIC HERMITE SPLINE** protected SimpleMatrix getCoefficients() not needed, use cluster unpack private SimpleMatrix getControlVectorFromArrays(double[initialVector, double[] finalVector) CubicHermiteSpline getControlVectorFromArrays.vi X X X CubicHermiteSpline makeHermiteBasis.vi private SimpleMatrix makeHermiteBasis() public CubicHermiteSpline(double[] xInitialControlVector, double[] X X X CubicHermiteSpline_New.vi xFinalControlVector, double[] yInitialControlVector, double[] vFinalControlVector) Optin Vot WPILIB Function Prototype Notes POSE WITH CURVATURE X public PoseWithCurvature(Pose2d poseMeters, double PoseWithCurve_New.vi curvatureRadPerMeter) public PoseWithCurvature() can use cluster constant public Pose2d poseMeters not needed, use cluster unpack

public double curvatureRadPerMeter.

not needed, use cluster unpack

	Implemented	Documented	ot WPILIB	Menu Item	Execution Optimized	Test Routine	Sample Program ameN IA			Code Review	sst Program	Error Checking
			Not		μŴ			Function Prototype	Notes		\	<u>m</u> _
QUINTIC HERMITE SPLINE	X	X		X			QuinticHermiteSpline_getCo	olVectorFromArrays.vi private SimpleMatrix getC initialVector, double[] fina	ControlVectorFromArrays(double[]			
	X	X		X			QuinticHermiteSpline_make	miteBasis.vi private SimpleMatrix mak	eHermiteBasis()			
	X	X		X			QuinticHermiteSpline_New.	public QuinticHermiteSpli double[] xFinalControlVed double[] yFinalControlVed protected SimpleMatrix ge	ine(double[] xInitialControlVector, ctor, double[] yInitialControlVector, ctor) etCoefficients() not needed, use cluster unpac	(
SPLINE (Abstract class)	X Implemented	X Documented	Not WPILIB	X Menu Item	Execution Optimized	Test Routine	Spline_getPoint.vi	Function Prototype public PoseWithCurvature	Notes e getPoint(double t)	Code Review	Test Program	Error Checking
								Spline(int degree) public static class Control	Mostor			
								public Static class Control public Control Vector (doub				
SPLINE HELPER	X Implementea	X Documented	Not WPILIB	X Menu Item	© Execution	X Test Routine	VI Name SplineHelp_GetCubicCtrlVe SplineHelp_GetCubicCtrlVe	scalar, Pose2d point) public static Spline.Control qetCubicControlVectorsF	romWaypoints(Pose2d start,	Code Review	Test Program	Error Checking
				1	-			Translation2d∏ interiorWa	aypoints, Pose2d end)			
	X	X	X	X No			SplineHelp_GetCubicCtrlVe SplineHelp_GetCubicSpline		internal			
	X	X		No			SplineHelp_GetCubicSpline		internal			
	X	X		No			SplineHelp GetCubicSpline		internal			
	X	X		X		X	SplineHelp_getCubicSplines	omControlVectors.vi public static CubicHermite getCubicSplinesFromCor Translation2d[] waypoints	eSpline[] htrolVectors(Spline.ControlVector start, s, Spline.ControlVector end)			
	X	X		X	SI		SplineHelp_GetQuinticCtrlV	private static Spline.Conti scalar, Pose2d point)	rolVector getQuinticControlVector(double			
							SplineHelp_GetQuinticCtrlV	public static List <spline.c< td=""><td>ControlVector> REMOVED 2762 FromWaypoints(List<pose2d></pose2d></td><td></td><td></td><td></td></spline.c<>	ControlVector> REMOVED 2762 FromWaypoints(List <pose2d></pose2d>			
	X	X		X			SplineHelp_GetQuinticCtrlV SplineHelp_getQuinticSpline	orsFromWeightedWayPts.vi romControlVectors.vi public static QuinticHermi	iteSpline[] ontrolVectors(Spline.ControlVector[]			
	X			X			SplineHelp_GetQuinticSplin	romWeightedWayPts.vi	New 2762			
	X	X		X			SplineHelp_GetQuinticSplin		New 2762			
	X	X		No			SplineHelp_ThomasAlgorith	ri private static void thomas c, double[] d, double[] sol	sAlgorithm(double[] a, double[] b, double[] internal utionVector)			
	Implemented	Documented	Not WPILIB	Menu Item	Execution Optimized	Test Routine	Sample Program ample Program	Function Prototype	Notes	Code Review	Test Program	Error Checking

SPL	INE	PARA	METE	ERIZE

ER	X	X	X		' - '	public static List <posewithcurvature> parameterize(Spline spline, double t0, double t1)</posewithcurvature>		
	X	X	X	X	SplineParam_Spline.vi	public static List <posewithcurvature> parameterize(Spline spline)</posewithcurvature>		
	Χ	Χ	X No		SplineParam_StackGet.vi		internal	
	Χ	X	X No		SplineParam_StackPop.vi		internal	
	Χ	Χ	X No		SplineParam_StackPush.vi		internal	

'======= TRAJECTORY

TRAJECTORY	X Implemented	X Documented	Not WPILIB	X Menu Item	Execution Optimized	Test Routine	ହୁ ଓଡ଼ି VI Name Trajectory_Concatenate.vi	Function Prototype	Notes	Code Review	Test Program	Error Checking
	X	X		X			Trajectory equals.vi	boolean equals(other obj)	FUTURE			
	X	X		X	SI		Trajectory_GetStates.vi	public List <state> getStates()</state>	not needed, use unpack			
	Χ	Χ		X	SI		Trajectory_GetTotalTime.vi	public double getTotalTimeSeconds()	not needed, use unpack			
	X	X		No	SI		Trajectory_lerp_double.vi	private static double lerp(double startValue, double endValue, double t)	internal			
	X	X		No	SI		Trajectory_lerp_Pose.vi	private static Pose2d lerp(Pose2d startValue, Pose2d endValue, double t)	internal			
	Χ	Χ		Χ	SI		Trajectory_New_Empty.vi	,				
	X	Χ		Χ	SI		Trajectory_New.vi	public Trajectory(final List <state> states)</state>				
	X	X		Χ			Trajectory_RelativeTo.vi	public Trajectory relativeTo(Pose2d pose)				
	X	Χ		Χ			Trajectory_Sample.vi	public State sample(double timeSeconds)				
	X	X	X	Χ			Trajectory_SampleReverse.vi		Sample in reverse order. Negate sample.			
	Χ	Χ		Χ			Trajectory_TransformBy.vi	public Trajectory transformBy(Transform2d transform)				
								public Pose2d getInitialPose()	can use cluster unpack, array index			

	Implemented	Documented	Not WPILIB	Menu Item	Execution Optimized	Test Routine	Sample Program	VI Name	Function Prototype	Notes	Code Review	Test Program	Error Checking
TRAJECTORY_STATE	X	X		X	SI			TrajectoryState_Equals.vi	boolean equals(other obj)				
	X	X	X	X	SI			TrajectoryState_GetAll.vi					
	X	X		X	SI			TrajectoryState_GetPose.vi					
	X	Χ		X				TrajectoryState_Interpolate.vi	State interpolate(State endValue, double i)				
	X	X		X	SI			TrajectoryState_New.vi	public State(double timeSeconds, double velocityMetersPerSecond, double accelerationMetersPerSecondSq, Pose2d poseMeters, double curvatureRadPerMeter) public State()				

	Implemented	Documented	Not WPILIB	Menu Item	Execution Optimized	Test Routine	Sample Program	VI Name	Function Prototype	Notes	Code Review	Test Program	Error Checking
TRAJECTORY CONFIG	Χ	Χ		Χ				TrajectoryConfig_AddConstraint.vi	public TrajectoryConfig addConstraint(TrajectoryConstraint constraint)	Implemented differently, can't duplicate.			
	X	Χ		Х				TrajectoryConfig_AddConstraints.vi	public TrajectoryConfig addConstraints(List extends TrajectoryConstraint constraints)	Implemented differently, can't duplicate.			
	X	Χ		Χ	SI			TrajectoryConfig_Create.vi	public TrajectoryConfig(double maxVelocityMetersPerSecond, double maxAccelerationMetersPerSecondSq)				
	Χ	Χ		Χ				TrajectoryConfig_GetCentripetalAccel.vi					

X	X	X	X		TrajectoryConfig_GetConstraints.vi	public List <trajectoryconstraint> getConstraints()</trajectoryconstraint>	Implemented differently, can't duplicate.
X	X		X		TrajectoryConfig_GetEndVelocity.vi	public double getEndVelocity()	can use cluster unpack
X	Χ		Χ		TrajectoryConfig_GetKinematicsDiffDrive.vi		
X	Χ		Χ		TrajectoryConfig GetKinematicsMecanumfDrive.vi		
X	Χ		Χ		TrajectoryConfig_GetKinematicsSwerveDrive.vi		
X	Χ	X	Χ		TrajectoryConfig GetMaxVelAccel.vi		
X	Χ		Χ		TrajectoryConfig GetStartVelocity.vi	public double getStartVelocity()	can use cluster unpack
X	Χ		Χ		TrajectoryConfig_GetVoltageDiffDrive.vi	• • • • • • • • • • • • • • • • • • • •	
X	Χ		Χ		TrajectoryConfig_IsReversed.vi	public boolean isReversed()	can use cluster unpack
X	X	X	Χ	SI	TrajectoryConfig_setCentripetalAccel.vi		
X	X		X		TrajectoryConfig_SetEndVelocity.vi	public TrajectoryConfig setEndVelocity(double endVelocityMetersPerSecond)	
X	X		X	SI	TrajectoryConfig_setKinematicsDiffDrive.vi	public TrajectoryConfig setKinematics(DifferentialDriveKinematics kinematics)	
X	X		X	SI	TrajectoryConfig_setKinematicsMecanumfDrive.vi	public TrajectoryConfig setKinematics(MecanumDriveKinematics kinematics)	
X	X		X	SI	TrajectoryConfig_setKinematicsSwerveDrive.vi	public TrajectoryConfig setKinematics(SwerveDriveKinematics kinematics)	
X	Χ		X	SI	TrajectoryConfig_setReversed.vi	public TrajectoryConfig setReversed(boolean reversed)	
X	X		X		TrajectoryConfig_SetStartVelocity.vi	public TrajectoryConfig setStartVelocity(double startVelocityMetersPerSecond)	
X	Χ	X	Χ	SI	TrajectoryConfig_setVoltageDiffDrive.vi		
						public double getMaxVelocity()	Created function to return both
						public double getMaxAcceleration()	Created function to return both

NOTE ADD OTHER "SET" ROUTINES FOR OTHER CONTRAINTS HERE, SINCE NEW CONTRAINTS ARE

									SPECIFIC AND NOT GENERIC.				
	Implemented	Documented	Not WPILIB	Month Hom	Merid lierii Execution Ontimized	Test Routine	Sample Program	VI Name	Function Prototype	Notes	Code Review	Test Program	Error Checking
TRAJECTORY GENERATE	X	X		7	X			TrajectoryGenerate_Make_Cubic_CtrlVect.vi	public static Trajectory generateTrajectory(Spline.ControlVector initial, List <translation2d> interiorWaypoints, Spline.ControlVectorend, TrajectoryConfig config)</translation2d>	uses cubic splines	_		7
	X	X		7	X			TrajectoryGenerate_Make_Cubic.vi	public static Trajectory generateTrajectory(Pose2d start, List <translation2d> interiorWaypoints, Pose2d end, TrajectoryConfig config)</translation2d>	uses cubic splines			
	X	X	X	·)	x			TrajectoryGenerate Make Generic.vi	Helper to bring these all together	Use this one!!!			
	X	X)	X			TrajectoryGenerate_Make_Quintic_CtrlVect.vi	public static Trajectory generateTrajectory(ControlVectorList controlVectors, TrajectoryConfig config)	uses quintic splines			
	X	X	X		X			TrajectoryGenerate_Make_Quintic_Weighted.vi		New 2762			
	Χ	X)	Υ			TrajectoryGenerate_Make_Quintic.vi	public static Trajectory generateTrajectory(List <pose2d> waypoints, TrajectoryConfig config)</pose2d>	uses quintic splines			
	Χ	X)	Χ			TrajectoryGenerate_splinePointsFromSplines.vi	public static List <posewithcurvature> splinePointsFromSplines(Spline[] splines)</posewithcurvature>				
	Implemented	Documented	Not WPILIB	Month the second	Menu nem	Test Routine	Sample Program	VI Name	Function Prototype	Notes	Code Review	Test Program	Error Checking
RAJECTORY GENERATE (Control Vector)									public ControlVectorList(int initialCapacity)	may not need, just data			
									public ControlVectorList()	may not need, just data			
									public ControlVectorList(Collection extends Spline.ControlVector collection)	may not need, just data			

FRC_LabVIEW_Trajectory_Library_Routines.xlsx Page 17 / 37 Revision 2.X 5/24/2022 - After documentation update Execution Optimized Routine Not WPILIB Venu Item Function Prototype Notes TRAJECTORY PARAMETERIZE X X TrajectoryParam calcStuffFwd.vi No X X X No TrajectoryParam calcStuffRev.vi Χ Χ TrajectoryParam enforceAccel.vi No private static void enforceAccelerationLimits(boolean reverse, his routines needs to be changed List<TrajectoryConstraint> constraints, ConstrainedState state) when new constraints are added. X X No TrajectoryParam enforceVelocity.vi This routines needs to be changed when new constraints are added. public static Trajectory timeParameterizeTrajectory(List<PoseWithCurvature> points. X X X TrajectoryParam timeParam.vi List<TrajectoryConstraint> constraints, double startVelocityMetersPerSecond, double endVelocityMetersPerSecond, double maxVelocityMetersPerSecond, double maxAccelerationMetersPerSecondSq, boolean reversed) Execution Optimized Venu Item Function Prototype VI Name Notes TRAJECTORY PARAMETERIZE CONSTRAINED STATE X ConstrainedState New.vi ConstrainedState(PoseWithCurvature pose, double distanceMeters, double maxVelocityMetersPerSecond, double minAccelerationMetersPerSecondSq, double maxAccelerationMetersPerSecondSq) X X X X ConstrainedState SetMaxAccel.vi $X \mid X \mid X \mid X$ ConstrainedState SetMinAccel.vi X X X X ConstrainedState SetVelAccel.vi X X X X ConstrainedState SetVelocity.vi ConstrainedState() ltem Function Prototype Notes TrajectoryUtil_fromPathWeaverJSON.vi TRAJECTORY UTIL X public static Trajectory fromPathweaverJson(Path path) X X X X TrajectoryUtil MakeWeightedWayPoint ENG.vi X X TrajectoryUtil MakeWeightedWayPoint.vi X $X \mid X$ Χ TrajectoryUtil_toPathWeaverJSON.vi X public static void toPathweaverJson(Trajectory trajectory, Path public static Trajectory deserializeTrajectory(String json) public static String serializeTrajectory(Trajectory trajectory) Wenu Item Function Prototype Notes TRAPEZOID PROFILE X TrapProfConstraint New.vi X X X X Χ TrapProfile Calculate.vi Χ Χ No TrapProfile Direct.vi Private, remove from menu XX X Χ TrapProfile Execute.vi X X X SI TrapProfile Execute AtGoal.vi XX X TrapProfile IsFinished.vi XX Χ TrapProfile_New_DefInitial.vi XX Χ TrapProfile New.vi

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X	Χ	No		TrapProfile_ShouldFlipAcceleration.vi	Private, remove from menu
X	X	Χ		TrapProfile_TimeLeftUntil.vi	
X	X	Χ		TrapProfile_TotalTime.vi	
X	X	Χ		TrapProfState_Equals.vi	
X	X	Χ		TrapProfState New.vi	

Function Prototype

Notes

'======== TRAJECTORY CONSTRAINT '======= Not WPILIB Menu Item Test Routir Function Prototype VI Name Notes public double getMaxVelocityMetersPerSecond(Pose2d poseMeters, double curvatureRadPerMeter, double CENTRIPETAL ACCELERATION CONSTRAINT X CentripetalAccelConstraint_getMaxVelocity.vi velocityMetersPerSecond) public MinMax CentripetalAccelConstraint getMinMaxAccel.vi Χ X getMinMaxAccelerationMetersPerSecondSq(Pose2d poseMeters, double curvatureRadPerMeter, double velocityMetersPerSecond) X X X SI CentripetalAccelConstraint New.vi public CentripetalAccelerationConstraint(double Can use cluster pack for now maxCentripetalAccelerationMetersPerSecondSq) Routine Vot WPILIB Function Prototype Notes DIFF DRIVE KINEMATIC CONSTRAINT X DiffDriveKinematicsConstraint getMaxVelocity.vi public double getMaxVelocityMetersPerSecond(Pose2d Χ poseMeters, double curvatureRadPerMeter, double velocityMetersPerSecond)
public MinMax Χ DiffDriveKinematicsConstraint getMinMaxAccel.vi X X getMinMaxAccelerationMetersPerSecondSq(Pose2d poseMeters, double curvatureRadPerMeter, double velocityMetersPerSecond) X SI DiffDriveKinematicsConstraint New.vi public DifferentialDriveKinematicsConstraint(final X X DifferentialDriveKinematics kinematics, double maxSpeedMetersPerSecond) Execution Optir Vot WPILIB Menu Item VI Name Function Prototype Notes public double getMaxVelocityMetersPerSecond(Pose2d poseMeters, double curvatureRadPerMeter, double DIFF DRIVE VOLTAGE CONSTRAINT DiffDriveVoltageConstraint getMaxVelocity.vi velocityMetersPerSecond) X X DiffDriveVoltageConstraint getMinMaxAccel.vi public MinMax getMinMaxAccelerationMetersPerSecondSq(Pose2d poseMeters, double curvatureRadPerMeter, double velocityMetersPerSecond) XX X SI DiffDriveVoltageConstraint_New.vi DifferentialDriveVoltageConstraint(SimpleMotorFeedforward feedforward, DifferentialDriveKinematics kinematics, double maxVoltage) ecution Optimized Routine Vot WPILIB Menu Item

FRC LabVIEW Trajectory Library - VI Implementation List Revision 2.X 5/24/2022 – After documentation update. ELLIPTICAL REGION CONSTRAINT X X EllipRegionConstraint getMaxVelocity.vi X X Χ EllipRegionConstraint_getMinMaxAccel.vi X X Χ EllipRegionConstraint_IsPoseInRegion.vi XX Χ EllipRegionConstraint New.vi Function Prototype Notes JerkConstraint_getMaxVelocity.vi JerkConstraint_getMinMaxAccel.vi JERK CONSTRAINT Routine exists, it is just a shell **FUTURE** X Routine exists, it is just a shell Χ **FUTURE** JerkConstraint_New.vi SI Routine exists, it is just a shell **FUTURE** Function Prototype Notes MAX VELOCITY CONSTRAINT MaxVelocityConstraint_getMaxVelocity.vi Χ X X SI MaxVelocityConstraint_getMinMaxAccel.vi MaxVelocityConstraint_New.vi Χ X X SI X Χ Χ Function Prototype Notes MECANUM DRIVE KINEMATICS CONSTRAINT $\begin{array}{c|c} \hline x & x \\ \hline x & x \end{array}$ X MecaDriveKinematicsConstraint_getMaxVelocity.vi MecaDriveKinematicsConstraint getMinMaxAccel.vi XX MecaDriveKinematicsConstraint_New.vi X SI Function Prototype Notes RECTANGULAR REGION CONSTRAINT X X Χ RectRegionConstraint_getRectRegion.vi RectRegionConstraint_getMinMaxAccel.vi RectRegionConstraint_IsPoseInRegion.vi X X Χ XX Χ XX RectRegionConstraint_New.vi Χ

	mplemented	Jocumented	Vot WPILIB	Jenu Item	Execution Optimized	Fest Routine	Sample Program	VI Name	Function Prototype	Notes
SWERVE DRIVE KINEMATICS CONSTRAINT	X	X		\overline{X}				SwerveDriveKinematicsConstraint_getMaxVelocity.vi	public double getMaxVelocityMetersPerSecond(Pose2d	
									poseMeters, double curvatureRadPerMeter, double	
	X	V		- V				Community of Community and American Community and Min Mary Association	velocityMetersPerSecond)	
	\ X	X		X				SwerveDriveKinematicsConstraint_getMinMaxAccel.vi	public MinMax	
									getMinMaxAccelerationMetersPerSecondSq(Pose2d poseMeters,	
									double curvatureRadPerMeter, double velocityMetersPerSecond)	

X	X		X	SI		SwerveDriveKinematicsConstraint_New.vi	Newpublic SwerveDriveKinematicsConstraint(final SwerveDriveKinematics kinematics, double maxSpeedMetersPerSecond)	Can use cluster pack for now	
mented	mented	VPILIB	ı Item	ution Optimized	Routine	ole Program			

TRAJECTORY CONSTRAINT

Impler	Docur	Not IN	Menu		Execu	Test F	ດສາສ gr NI Name	Function Prototype	Notes
· X	X	(X	()	7			TrajConstraint_GetMaxVelocity.vi		
X	X	(X	()	(TrajConstraint_GetMinMaxAccel.vi		
X	΄ χ	(X	()	(TrajConstraint_GetType.vi		

	Implemented	Documented	Not WPILIB	Menu Item	Execution Optimized	Test Routine	Sample Program	VI Name	Function Prototype	Notes
TRAJECTORY CONSTRAINT (Min Max)	X	Χ		X	SI			Constraint_MinMax_New.vi	Constraint_MinMax_New	
	X	Χ		X	SI			Constraint_MinMax_NewMinMax.VI	Constraint_MinMax_New	

'========

UTILITY

THESE ROUTINES ARE SPECIFIC TO LABVIEW. THEY DO NOT HAVE A JAVA / C++ WPILIB EQUIVALENT

	Implemented	Documented	Not WPILIB	Menu Item	Execution Optimized	Test Routine	Sample Program	VI Name	Function Prototype	Notes
UTIL	Χ	Χ	Χ	X	SI			Util_ApproxEqual.vi		
	Χ	Χ	Χ	X				Util_Array_PoseWCurv_to_XY.vi		
	Χ	Χ	Χ	X	SI			Util_CalcDist.vi		
	Χ	Χ	Χ	Χ	SI			Util_GetLibraryVersion.vi		
	Χ	Χ	Χ	Χ	SI			Util_GetLibUsage.vi		
	X	X	X	X				Util_GetTime.vi		Once tested completely, this should be optimized!
	Χ	Χ	Χ	No	N/A			Util_LibraryGlobals.vi		Global Variables – no block diag.
	Χ	Χ	Χ	X				Util_Trajectory_Absolute_To_Relative.vi		
	Χ	Χ	X	X				Util_Trajectory_ReadFile.vi		
	Χ	Χ	X	X				Util_Trajectory_to_XY.vi		
	Χ	Χ	X	No				Util_Trajectory_WriteFile_Config.vi		internal
	Χ	Χ	Χ	No				Util_Trajectory_WriteFile_OneState.vi		internal
	Χ	Χ	X	X				Util_Trajectory_WriteFile_PathFinder.vi		
	X	Χ	Χ	No				Util_Trajectory_WriteFile_PathFinderConfig.vi		internal
	Χ	Χ	X	X				Util_Trajectory_WriteFile_Pathweaver.vi		
	Χ	Χ	X	No				Util_Trajectory_WriteFile_States.vi		internal
	Χ	Χ	X	No				Util_Trajectory_WriteFile_WayPoints.vi		internal
	X	Χ	Χ	X				Util_Trajectory_WriteFile.vi		
	X	Χ	X	X				Util_TrajectoryState_Meters_To_Inches.vi		
	X	X	X	X				Util_TrajState_to_DiffDrive_WheelPos.vi		
	Χ	X	X	X				Util_DispWaypoint_Eng_To_Sl.vi		
	X	X	X	X				Util_DispWaypoint_To_CubicInput.vi		
	X	X	X	X				Util_DispWaypoint_To_QuinticInput.vi		
	X	X	X	X				Util_DispWeightedWaypiont_Eng_To_WeightedWaypoint		
	Χ	Χ	X	No				Util_DispWeightedWayPoint_To_WeightedWayPoint.vi		Sorry about the confusing name

CONVERSIONS

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THESE ROUTINES ARE SPECIFIC TO LABVIEW. THEY DO NOT HAVE A JAVA / C++ WPILIB EQUIVALENT

	Implemented	Documented	Not WPILIB	Menu Item	Execution Optimiz	Test Routine	Sample Program	VI Name	Function Prototype	Notes
CONV	Χ	Χ	Χ	Χ	SI			Conv_AngleDegrees_Heading.vi		
	Χ	Χ	Χ	Χ	SI			Conv_AngleRadians_Heading.vi		
	Χ	Χ	Χ	Χ	SI			Conv_Centimeters_Meters.vi		
	Χ	Χ	Χ	Χ	SI			Conv_Deg_Radians.vi		
	Χ	Χ	Χ	Χ	SI			Conv_Deg_Rotations.vi		
	Χ	Χ	Χ	Χ	SI			Conv_Feet_Meters.vi		
	Χ	Χ	Χ	Χ	SI			Conv_GyroDegrees_Heading.vi		
	Χ	Χ	Χ	Χ	SI			Conv_Heading_AngleRadians.vi		
	Χ	Χ	Χ	Χ	SI			Conv_Inches_Meters.vi		
	Χ	Χ	Χ	Χ	SI			Conv_Kilograms_Pounds.vi		
	Χ	Χ	Χ	Χ	SI			Conv_Meters_Feet.vi		
	Χ	Χ	Χ	Χ	SI			Conv_Meters_Inches.vi		
	Χ	Χ	Χ	Χ	SI			Conv_Pose2d_SI_Eng.vi		
	Χ	Χ	Χ	Χ	SI			Conv_Pounds_Kilograms.vi		
	Χ	Χ	Χ	Χ	SI			Conv_Radians_Deg.vi		
	Χ	Χ	Χ	Χ	SI			Conv_Radians_Rotations.vi		
	X	Χ	Χ	X	SI			Conv_Rotations_Deg.vi		
	X	X	Χ	X	SI			Conv_Rotations_Radians.vi		
	Χ	X	X	X	SI			Conv_Yards_Meters.vi		

	Implemented	Documented	Not WPILIB	Menu Item	Execution Optimized	Test Routine	Sample Program	VI Name	Function Prototype	Notes
UNITS	Χ	Χ		Χ	SI			Units_DegreesToRadians.vi		
	Χ	Χ		Χ	SI			Units_DegreesToRotations.vi		
	Χ	X		Χ	SI			Units_FeetToMeters.vi		
	Χ	X		Χ	SI			Units_InchesToMeters.vi		
	Χ	X		Χ	SI			Units_MetersToFeet.vi		
	Χ	X		Χ	SI			Units_MetersToInches.vi		
	Χ	X		Χ	SI			Units_MillisecondsToSeconds.vi		
	Χ	X		Χ	SI			Units_RadiansPerSecondToRotationsPerMinute.vi		
	Χ	X		Χ	SI			Units_RadiansToDegrees.vi		
	Χ	Χ		Χ	SI			Units_RadiansToRotations.vi		
	Χ	Χ		Χ	SI			Units_RotationsPerMinuteToRadiansPerSecond.vi		
	Χ	Χ		Χ	SI			Units_RotationsToDegrees.vi		
	X	Χ		Χ	SI			Units_RotationsToRadians.vi		
	Χ	X		Χ	SI			Units_SecondsToMilliseconds.vi		

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PATHFINDER UTIL

THESE ROUTINES ARE SPECIFIC TO LABVIEW. THEY DO NOT HAVE A JAVA / C++ WPILIB EQUIVALENT

Function Prototype

Notes

Revision 2.X 5/24/2022 – After documentation update.

PATHFINDERUTIL

IL X	Χ	Χ	X		PathfinderUtil_Continuous_Heading_Difference.vi
X	X	Χ	X		PathfinderUtil_OptimizeTrajectoryStates.vi
X	X	Χ	Χ		PathfinderUtil_ToTrajectory.vi
X	X	X	Χ		PathfinderUtil_ToTrajectoryStates.vi

'====== STATE SPACE MODEL '=======

> Function Prototype Notes VI Name DCMotor GetAndymark9015.vi DC MOTOR X X X SI DCMotor_GetAndymarkRs775_125.vi X X Χ SI Χ X SI DCMotor GetBag.vi DCMotor_GetBanebotsRs550.vi Χ X SI Χ X X X SI DCMotor_GetBanebotsRs775.vi XX X SI DCMotor GetCIM.vi XX X SI DCMotor GetCurrent.vi XX X SI DCMotor GetFalcon500.vi DCMotor_GetMiniCIM.vi XX X SI X X DCMotor_GetNEO.vi X SI X SI X X DCMotor GetNEO550.vi Χ X Χ SI DCMotor GetRomiBuiltIn.vi X X X SI DCMotor GetVex775Pro.vi Χ X SI DCMotor New.vi X Χ X SI DCMotor_PickMotor.vi

	Implemented	Documented	Not WPILIB	Menu Item	Execution Optimiz	Test Routine	Sample Program Name	Function Prototype	Notes	Code Review	Test Program	Error Checking
LINEAR SYSTEM ID	Χ	X		X			LinearSystemId_CreateDCMotorSystem.vi					
	X	X		X			LinearSystemId_CreateDriveTrainVelocitySystem.vi		Update to use create matrix			
	X	X		X			LinearSystemId_CreateElevatorSystem.vi		Update to use create matrix			
	Χ	X		X			LinearSystemId_CreateFlywheelSystem.vi		Update to use create matrix			
	X	Χ		X			LinearSystemId_CreateSingleJointedArmSystem.vi		Update to use create matrix			
	Χ	Χ		X			LinearSystemId_IdentifyDriveTrainSystem.vi		Update to use create matrix			
	Χ	Χ		X			LinearSystemId_IdentifyPositionSystem.vi		Update to use create matrix			
	Χ	Χ		X			LinearSystemId_IdentifyVelocitySystem.vi		Update to use create matrix			

'====== STATE SPACE ESTIMATION '=======

> Menu Item Function Prototype Notes DIFFERENTIAL DRIVE POSE ESTIMATOR X X DiffDrivePoseEst_AddVisionMeasurement.vi X X X DiffDrivePoseEst FillStateVector.vi XX Χ DiffDrivePoseEst_GetEstimatedPosition.vi XX Χ DiffDrivePoseEst Kalman F Callback.vi XX X DiffDrivePoseEst Kalman H Callback.vi

### A	X 5/24/2022 – After documentation update.									
Manual Part Tell Alter Cooker Bask 100 Manual Part				Χ			DiffDrivePoseEst_New.vi			
Milliver-rocking Milliver-ro										
X										
EXTENDED KALMAN FILTER							DIMDRIVEPOSEEST_Update.vi			
A										
### PATCHIOED MALMAN FILTER A	_	X X								
EXTENDED KALAMAN FILTER EXTENDED KALAMAN FILT	L	<u> </u>					DITIDITY OF COSELSI_VISION CONTECT_NATION IN THE CAMBACK. VI			
Extraction Ext	EXTENDED KALMAN FILTER			Menu		Test Routine		Code Review	Test Program	<u>_</u>
X										
X										
X										
X										
X				Χ						
Ralman Filter Latency Compensator		XX		Χ			ExtendedKalmanFilter_Reset.vi			
RALMAN FILTER LATENCY COMPENSATOR X X X X X X X X X										
Notes Note		$X \mid X$		Χ			ExtendedKalmanFilter_SetXHat.vi			
KALMAN FILTER LATENCY COMPENSATOR X X X X X X KalmanFilterLatencyComp_AddObserverState.vi X X X X X X KalmanFilterLatencyComp_ApplyPastGlobalMeas_FuncGroup.vi X X X X X X KalmanFilterLatencyComp_ApplyPastGlobalMeasurement_UKF.vi X X X X X X KalmanFilterLatencyComp_FindClosestMeasurement.vi X X X X X X KalmanFilterLatencyComp_FindClosestMeasurement.vi X X X X X X KalmanFilterLatencyComp_New.vi X X X X X KalmanFilterLatencyComp_Deserver_New.vi					imiz					8
X X <td></td> <td>X X X X X X X X X X X X X X X X X X X</td> <td></td> <td>X X X X X X X</td> <td>Execution</td> <td>X X X X</td> <td>KalmanFilter_Correct.vi KalmanFilter_GetK KalmanFilter_GetK_Single.vi KalmanFilter_GetXHat KalmanFilter_GetXHaT_Single KalmanFilter_New.vi KalmanFilter_Predict.vi KalmanFilter_Reset.vi KalmanFilter_SetXHat</td> <td>Code Review</td> <td>Test Program</td> <td>Error Checkin</td>		X X X X X X X X X X X X X X X X X X X		X X X X X X X	Execution	X X X X	KalmanFilter_Correct.vi KalmanFilter_GetK KalmanFilter_GetK_Single.vi KalmanFilter_GetXHat KalmanFilter_GetXHaT_Single KalmanFilter_New.vi KalmanFilter_Predict.vi KalmanFilter_Reset.vi KalmanFilter_SetXHat	Code Review	Test Program	Error Checkin
X X <td>KALMAN FILTER LATENCY COMPENSATOR</td> <td>X X X X X X X X X X X X X X X X X X X</td> <td>Not WPILIB</td> <td>X X X X X X X X X X X X X X X X X X X</td> <td>Execution Optimized Execution</td> <td>X X X X</td> <td>KalmanFilter_GetK KalmanFilter_GetK Single.vi KalmanFilter_GetX Single.vi KalmanFilter_GetXHat KalmanFilter_GetXHat KalmanFilter_GetXHat KalmanFilter_GetXHat KalmanFilter_Predict.vi KalmanFilter_Reset.vi KalmanFilter_SetXHat KalmanFilter_SetXHat KalmanFilter_SetXHat KalmanFilter_SetXHat KalmanFilter_SetXHat_Single VI Name Function Prototype Notes KalmanFilterLatencyComp_AddObserverState.vi KalmanFilterLatencyComp_ApplyPastGlobalMeas_FuncGroup.vi</td> <td>Code</td> <td>Test Program</td> <td>r Checking</td>	KALMAN FILTER LATENCY COMPENSATOR	X X X X X X X X X X X X X X X X X X X	Not WPILIB	X X X X X X X X X X X X X X X X X X X	Execution Optimized Execution	X X X X	KalmanFilter_GetK KalmanFilter_GetK Single.vi KalmanFilter_GetX Single.vi KalmanFilter_GetXHat KalmanFilter_GetXHat KalmanFilter_GetXHat KalmanFilter_GetXHat KalmanFilter_Predict.vi KalmanFilter_Reset.vi KalmanFilter_SetXHat KalmanFilter_SetXHat KalmanFilter_SetXHat KalmanFilter_SetXHat KalmanFilter_SetXHat_Single VI Name Function Prototype Notes KalmanFilterLatencyComp_AddObserverState.vi KalmanFilterLatencyComp_ApplyPastGlobalMeas_FuncGroup.vi	Code	Test Program	r Checking
X X X KalmanFilterLatencyComp_Observer_New.vi	KALMAN FILTER LATENCY COMPENSATOR	X	Not WPILIB	X X X X X X X X X X X X X X X X X X X	Execution Optimized Execution	X X X X	KalmanFilter_GetK KalmanFilter_GetK Single.vi KalmanFilter_GetXHat KalmanFilter_GetXHat KalmanFilter_GetXHat Single KalmanFilter_GetXHat Single KalmanFilter_Perdict.vi KalmanFilter_Predict.vi KalmanFilter_Reset.vi KalmanFilter_SetXHat KalmanFilter_SetXHat KalmanFilter_SetXHat KalmanFilter_SetXHat KalmanFilter_SetXHat_Single VI Name Function Prototype Notes KalmanFilterLatencyComp_AddObserverState.vi KalmanFilterLatencyComp_ApplyPastGlobalMeas_FuncGroup.vi KalmanFilterLatencyComp_ApplyPastGlobalMeasurement_UKF.vi KalmanFilterLatencyComp_FindClosestMeasurement_Vi	Code	Test Program	r Checking
X X X KalmanFilterLatencyComp_Reset.vi	KALMAN FILTER LATENCY COMPENSATOR	X	Not WPILIB	X	Execution Optimized Execution	X X X X	KalmanFilter_GetK KalmanFilter_GetK Single.vi KalmanFilter_GetXHat KalmanFilter_GetXHat KalmanFilter_GetXHat KalmanFilter_New.vi KalmanFilter_New.vi KalmanFilter_New.vi KalmanFilter_SetXHat KalmanFilter_SetXHat KalmanFilter_SetXHat KalmanFilter_SetXHat KalmanFilter_SetXHat_Single VI Name KalmanFilter_LatencyComp_AddObserverState.vi KalmanFilter_LatencyComp_ApplyPastGlobalMeas_FuncGroup.vi KalmanFilter_LatencyComp_ApplyPastGlobalMeasurement_UKF.vi KalmanFilter_LatencyComp_FindClosestMeasurement.vi KalmanFilter_LatencyComp_FindClosestMeasurement.vi KalmanFilter_LatencyComp_New.vi	Code	Test Program	r Checking
	KALMAN FILTER LATENCY COMPENSATOR	X	Not WPILIB	X	Execution Optimized Execution	X X X X	KalmanFilter_GetK KalmanFilter_GetK Single vi KalmanFilter_GetXHat KalmanFilter_GetXHat KalmanFilter_GetXHat Single KalmanFilter_RetXHat Single KalmanFilter_Reset.vi KalmanFilter_SetXHat KalmanFilter_SetXHat KalmanFilter_SetXHat KalmanFilter_SetXHat Single VI Name Function Prototype Notes KalmanFilter_LatencyComp_AddObserverState.vi KalmanFilter_LatencyComp_ApplyPastGlobalMeas_FuncGroup.vi KalmanFilter_LatencyComp_ApplyPastGlobalMeasurement_UKF.vi KalmanFilter_LatencyComp_New.vi KalmanFilter_LatencyComp_New.vi KalmanFilter_LatencyComp_New.vi	Code	Test Program	r Checking

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MECANIUM DRIVE DOCE FORMATOR		Q	_ <	~~	Ш	<u> </u>		VI Name	Function Prototype	Notes		F	Ш
MECANUM DRIVE POSE ESTIMATOR	X	~		~				MecaDrivePoseEst_AddVisionMeasurement_StdDev.vi MecaDrivePoseEst AddVisionMeasurement.vi					
	X	X		X				MecaDrivePoseEst_AddvisionMeasurement.vi MecaDrivePoseEst GetEstimatedPosition.vi					
	X	X		No				MecaDrivePoseEst_GetEstimatedPosition.vi MecaDrivePoseEst Kalman F Callback.vi					
	X	X		No				MecaDrivePoseEst_Kalman_H_Callback.vi					
		X		X				MecaDrivePoseEst New.vi					
		X		X				MecaDrivePoseEst ResetPosition.vi					
	X	X		X				MecaDrivePoseEst SetVisionMeasurementStdDevs.vi					
		Χ		X				MecaDrivePoseEst_Update.vi					
		Χ		Х				MecaDrivePoseEst_UpdateWithTime.vi					
		Χ		No				MecaDrivePoseEst_VisionCorrect_Callback.vi					
	X	Χ		No				MecaDrivePoseEst_VisionCorrect_Kalman_H_Callback.vi			-		
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	Implemente	Documente	Not WPILIB	Menu Item	Execution	Test Routine	San	VI Name	Function Prototype	Notes	Code Reviev	Test Program	Error
SWERVE DRIVE POSE ESTIMATOR								SwerveDrivePoseEst AddVisionMeasurement StdDev.vi	T direction i recetype	11000			7
	X	Χ		Х				SwerveDrivePoseEst AddVisionMeasurement.vi					
	X	Χ		X				SwerveDrivePoseEst GetEstimatedPosition.vi					
		Χ		Х				SwerveDrivePoseEst Kalman F Callback.vi					
		Χ		Χ				SwerveDrivePoseEst Kalman H Callback.vi					
	X	Χ		X				SwerveDrivePoseEst_New.vi					
		Χ		X				SwerveDrivePoseEst_ResetPosition.vi					
	X	Χ		Χ				SwerveDrivePoseEst_SetVisionMeasurementStdDevs.vi					
		Χ		Χ				SwerveDrivePoseEst_Update.vi					
		Χ		Χ				SwerveDrivePoseEst_UpdateWithTime.vi					
		Χ		Χ				SwerveDrivePoseEst_VisionCorrect_Callback.vi					
	X	Χ		Χ				SwerveDrivePoseEst_VisionCorrect_Kalman_H_Callback.vi					
					_								
					zec								
					тi		ш						75
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	nte	nte	7	E	u U	Routine	Pro				Code Revien	Program	ec
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	ble	CC	, <u>,</u>	Menu	ec	Test I	Į,				ge.	Test I	õ
			Not		Ĕ		Sa	VI Name	Function Prototype	Notes	ප		Err
UNSCENTED KALMAN FILTER		Χ		X				UnscentedKalmanFilter_Correct_FuncGroup.vi			<u> </u>		
		Χ		X				UnscentedKalmanFilter_Correct_OnlyUY.vi			,		
		Χ		Χ				UnscentedKalmanFilter_Correct_OnlyUYR.vi					
		Χ		Χ				UnscentedKalmanFilter_Correct.vi					
		Χ		Χ				UnscentedKalmanFilter_GetP_Single.vi			·		
		Χ		X				UnscentedKalmanFilter_GetP.vi					
		X		X				UnscentedKalmanFilter_GetXHat_Single.vi					
	X	X		X				UnscentedKalmanFilter_GetXHat.vi					
	X	X		X				UnscentedKalmanFilter_New_Default.vi					
		X		X				UnscentedKalmanFilter_New_FuncGroup.vi					
		X		X				UnscentedKalmanFilter_New.vi					
		X		X				UnscentedKalmanFilter_Predict.vi					
		X		X				UnscentedKalmanFilter_Reset.vi					
		X		X				UnscentedKalmanFilter_SetP.vi					
		X		X				UnscentedKalmanFilter_SetXHat_Single.vi					
	X	Χ		X				UnscentedKalmanFilter_SetXHat.vi					

X	Y	Χ	UnscentedKalmanFilter_Transform.vi			

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STATE SPACE CONTROL

	Implemented	Documented Not WPILIB	Menu Item	Execution Optimized Test Routine	Sample Program	VI Name	Function Prototype	Notes	Code Review	Test Program	
ITROL AFFINE PLANT INVERSION FEEDFORW	ARD		-		+						-
DIFFERENTIAL DRIVE ACCELERATION LIMI	X X Implemented X Occumented		X Menu Item	Execution Optimized X Test Routine	Sam	VI Name DiffDrvAccelLimit_Calculate.vi	Function Prototype	Notes	Code Review	Test Program	
DIFFERENTIAL DRIVE ACCELERATION LIMI	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	<u> </u>	X	X		DiffDrvAccelLimit_Calculate.vi DiffDrvAccelLimit New.vi					\vdash
IMPLICIT MODEL FOLLOV	WER X X	X X	X Wenu Item	Execution Optir X X X Test Routine	Sam	VI Name ImplModelFollow_Calculate.vi ImplModelFollow_GetU.vi ImplModelFollow_GetU_Single.vi	Function Prototype	Notes	Code Review	Test Program	
	XX		X	X		ImplModelFollow_New.vi					
	XX		Х	X		ImplModelFollow_New_Plant.vi					
	XX	Υ	X	X		ImplModelFollow_Reset.vi					-
	lented ented	ептеа		n Optimized utine	Program		Function Prototyne	Notes	Sode Review	rest Program	
LINEAR PLANT INVERSION FEEDFORW	WARD X	X Documented Not WPILIB	tem :	Optimized	Sample Program	VI Name LinearPlntInvFF_Calculate_NextR.vi	Function Prototype	Notes	Code Review	Test Program	
LINEAR PLANT INVERSION FEEDFORW.	VARD X X	X X Documented Not WPILIB	X Menu Item	n Optimized utine	Sample Program	VI Name LinearPIntInvFF_Calculate_NextR.vi LinearPIntInvFF_Calculate.vi	Function Prototype	Notes		Test Program	
LINEAR PLANT INVERSION FEEDFORW	VARD X X X X X X X X X X X X X X X X X X X	X X X Documented Not WPILIB	X Wenu Item	n Optimized utine	Sample Program	VI Name LinearPIntInvFF_Calculate_NextR.vi LinearPIntInvFF_Calculate.vi LinearPIntInvFF_GetR_Single.vi	Function Prototype	Notes		Test Program	
LINEAR PLANT INVERSION FEEDFORW.	VARD X X X X X X X X X X X X X X X X X X X	X X X Documented Not WPILIB	X X X X X X X X X X X X X X X X X X X	n Optimized utine	Sample Program	VI Name LinearPIntInvFF_Calculate_NextR.vi LinearPIntInvFF_Calculate.vi LinearPIntInvFF_GetR_Single.vi LinearPIntInvFF GetR.vi	Function Prototype	Notes		Test Program	
LINEAR PLANT INVERSION FEEDFORW.	VARD X X X X X X X X X X X X X X X X X X X	X X X Documented Not WPILIB	X X X X X X X X X X X X X X X X X X X	n Optimized utine	Sample Program	VI Name LinearPIntInvFF_Calculate_NextR.vi LinearPIntInvFF_Calculate.vi LinearPIntInvFF_GetR_Single.vi LinearPIntInvFF_GetR.vi LinearPIntInvFF_GetUff_Single.vi	Function Prototype	Notes		Test Program	
LINEAR PLANT INVERSION FEEDFORW.	ARD X X X X X X X X X X X X X X X X X X X	X X X X Documented Not WPILIB	X X X X X X X X X X X X X X X X X X X	n Optimized utine	Sample Program	VI Name LinearPIntInvFF_Calculate_NextR.vi LinearPIntInvFF_Calculate.vi LinearPIntInvFF_GetR_Single.vi LinearPIntInvFF_GetR.vi LinearPIntInvFF_GetUff_Single.vi LinearPIntInvFF_GetUff_Single.vi LinearPIntInvFF_GetUff.vi	Function Prototype	Notes		Test Program	
LINEAR PLANT INVERSION FEEDFORW.	VARD X X X X X X X X X X X X X X X X X X X	X X X X Documented Not WPILIB	X X X X X X X X X X X X X X X X X X X	n Optimized utine	Sample Program	VI Name LinearPIntInvFF_Calculate_NextR.vi LinearPIntInvFF_Calculate.vi LinearPIntInvFF_GetR_Single.vi LinearPIntInvFF_GetR.vi LinearPIntInvFF_GetUff_Single.vi LinearPIntInvFF_GetUff_Single.vi LinearPIntInvFF_GetUff.vi LinearPIntInvFF_New_Plant.vi	Function Prototype	Notes		Test Program	
LINEAR PLANT INVERSION FEEDFORW.	ARD X X X X X X X X X X X X X X X X X X X	X X X X Documented Not WPILIB	X X X X X X X X X X X X X X X X X X X	n Optimized utine	Sample Program	VI Name LinearPIntInvFF_Calculate_NextR.vi LinearPIntInvFF_Calculate.vi LinearPIntInvFF_GetR_Single.vi LinearPIntInvFF_GetR.vi LinearPIntInvFF_GetUff_Single.vi LinearPIntInvFF_GetUff_Single.vi LinearPIntInvFF_GetUff.vi	Function Prototype	Notes		Test Program	

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	nplemente	Documentec Not WPILIB	Menu Item	20 (Test Routine	Ž.		eviė	Program	Jec
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LINEAR QUARRATIO REQUILATOR	_ =		_ 	<u> </u>	<u> </u>		Notes	U U	, ř	<u> </u>
LINEAR QUADRATIC REGULATOR		X X	X			LinearQuadraticRegulator_Calculate_NextR.vi LinearQuadraticRegulator_Calculate.vi				
		X	X			LinearQuadraticRegulator_Carculate.vi LinearQuadraticRegulator_GetK_Single.vi	NOT ORIGINAL			
	X	X	X		X	LinearQuadraticRegulator GetK.vi	IVOT ORIGINAL			
	X	X	X			LinearQuadraticRegulator_GetR_Single.vi				
	X	X	X			LinearQuadraticRegulator GetR.vi				
	X	Χ	X			LinearQuadraticRegulator_GetU_Single.vi				
	X	Χ	X			LinearQuadraticRegulator_GetU.vi				
	X	X	X		X	LinearQuadraticRegulator_LatencyCompensate.vi	Routine exists, but it only has			
						Li O L C D L C N FINO	interger raise matrix to power.			
		X	X			LinearQuadraticRegulator_New_ELMS.vi				
	Χ	X	X			LinearQuadraticRegulator_New_N.vi LinearQuadraticRegulator_New_Raw.vi				
	X	_	X		X	LinearQuadraticRegulator_New_Raw.vi LinearQuadraticRegulator_New_SystemELMS.vi				
	X	X	X			LinearQuadraticRegulator_New_SystemELins.vi LinearQuadraticRegulator_New.vi				
		X	X			LinearQuadraticRegulator_New.vi LinearQuadraticRegulator_Reset.vi				
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LINEAR SYSTEM	1 X	X	X	Ī		LinearSystem_CalculateX.vi				
	X	Χ	X	- 1		LinearSystem_CalculateY.vi				
	X	Χ	X	SI		LinearSystem_GetA.vi				
		X	X	SI		LinearSystem_GetAElement.vi				
		Χ	X	SI		LinearSystem_GetB.vi				
		X	Χ			LinearSystem_GetBElement.vi				
	X	X	X	SI		LinearSystem_GetC.vi				
		X	X	SI		LinearSystem_GetCElement.vi				
		X		SI		LinearSystem_GetD.vi				
	X	X	X		1	1: 0 / 0 /DEI / :				
	1 X 1			SI	-	LinearSystem_GetDElement.vi				
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		^	X	SI						
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			X	Optimized S	,ue	LinearSystem_New.vi		we)	am	sking
			X	Optimized S	outine	LinearSystem_New.vi		leview	ogram	hecking
			X	Optimized S	* Routine	LinearSystem_New.vi		e Review	t Program	ır Checking
			X	Optimized S	est Routine	LinearSystem_New.vi	Notes	ode Review		rror Checking
LINEAR SYSTEM LOOP	Implemented	Documented Not WPILIB	Menu Item	nized S	Test Routine	LinearSystem_New.vi English VI Name Function Prototype	Notes	Code Review	Test Program	Error Checking
LINEAR SYSTEM LOOF	X Implemented	X Documented Not WPILIB	X Menu Item	Optimized S	Test Routine	LinearSystem_New.vi Substitute VI Name	Notes	Code Review		Error Checking
LINEAR SYSTEM LOOF	X Implemented	Documented Not WPILIB	Menu Item	Optimized S	Test Routine	LinearSystem_New.vi VI Name Function Prototype LinearSystemLoop_ClampInput.vi LinearSystemLoop_Correct.vi	Notes	Code Review		Error Checking
LINEAR SYSTEM LOOF	X / Implemented	X X Documented Not WPILIB	X Wenu Item	Optimized S	Test Routine	LinearSystem_New.vi VI Name Function Prototype LinearSystemLoop_ClampInput.vi LinearSystemLoop_Correct.vi LinearSystemLoop_GetClampFunction.vi	Notes	Code Review		Error Checking
LINEAR SYSTEM LOOF	X Implemented	X Documented Not WPILIB	X Wenu Item	Optimized S	Test Routine	LinearSystem_New.vi VI Name Function Prototype LinearSystemLoop_ClampInput.vi LinearSystemLoop_Correct.vi LinearSystemLoop_GetClampFunction.vi LinearSystemLoop_GetController.vi	Notes	Code Review		Error Checking
LINEAR SYSTEM LOOF	X X Implemented	X Nocumented Not WPILIB	X Wenu Item	Optimized S	Test Routine	LinearSystem_New.vi VI Name Function Prototype LinearSystemLoop_ClampInput.vi LinearSystemLoop_Correct.vi LinearSystemLoop_GetClampFunction.vi LinearSystemLoop_GetController.vi LinearSystemLoop_GetError_Single.vi	Notes	Code Review		Error Checking
LINEAR SYSTEM LOOF	X X Implemented	X Not WPILIB	X X X X X	Optimized S	Test Routine	LinearSystem_New.vi VI Name Function Prototype LinearSystemLoop_ClampInput.vi LinearSystemLoop_Correct.vi LinearSystemLoop_GetClampFunction.vi LinearSystemLoop_GetController.vi LinearSystemLoop_GetError_Single.vi LinearSystemLoop_GetError_Single.vi LinearSystemLoop_GetError.vi	Notes	Code Review		Error Checking
LINEAR SYSTEM LOOF	X X X Implemented	X Nocumented Not WPILIB	X Wenu Item	Optimized S	Test Routine	LinearSystem_New.vi VI Name Function Prototype LinearSystemLoop_ClampInput.vi LinearSystemLoop_Correct.vi LinearSystemLoop_GetClampFunction.vi LinearSystemLoop_GetController.vi LinearSystemLoop_GetError_Single.vi	Notes	Code Review		Error Checking
LINEAR SYSTEM LOOF	X X X X X X X X X X X X X X X X X X X	X Documented X Not WPILIB	X Wenu Item X X X X X	Optimized S	Test Routine	LinearSystem_New.vi VI Name Function Prototype LinearSystemLoop_ClampInput.vi LinearSystemLoop_Correct.vi LinearSystemLoop_GetClampFunction.vi LinearSystemLoop_GetController.vi LinearSystemLoop_GetError_Single.vi LinearSystemLoop_GetFeedForward.vi LinearSystemLoop_GetFeedForward.vi LinearSystemLoop_GetFeedForward.vi LinearSystemLoop_GetFeedForward.vi LinearSystemLoop_GetNextR_Single.vi LinearSystemLoop_GetNextR_Single.vi LinearSystemLoop_GetNextR_Single.vi LinearSystemLoop_GetNextR_Single.vi	Notes	Code Review		Error Checking
LINEAR SYSTEM LOOF	X X X X X X X X X X X X X X X X X X X	X Documented X X Not WPILIB	X X X X X X X	Optimized S	Test Routine	LinearSystem_New.vi VI Name Function Prototype LinearSystemLoop_ClampInput.vi LinearSystemLoop_Correct.vi LinearSystemLoop_GetClampFunction.vi LinearSystemLoop_GetController.vi LinearSystemLoop_GetError_Single.vi LinearSystemLoop_GetError.vi LinearSystemLoop_GetFeedForward.vi LinearSystemLoop_GetNextR_Single.vi LinearSystemLoop_GetNextR_Single.vi LinearSystemLoop_GetNextR_Single.vi LinearSystemLoop_GetNextR_Single.vi LinearSystemLoop_GetNextR_Single.vi LinearSystemLoop_GetNextR_Single.vi LinearSystemLoop_GetNextR_Vi LinearSystemLoop_GetNextR_Vi LinearSystemLoop_GetObserver.vi	Notes	Code Review		Error Checking
LINEAR SYSTEM LOOF	X X X X X X X X X X X X X X X X X X X	X Not WPILIB	X Wenn Item X X X X X X X	Optimized S	Test Routine	LinearSystem_New.vi VI Name LinearSystemLoop_ClampInput.vi LinearSystemLoop_Correct.vi LinearSystemLoop_GetClampFunction.vi LinearSystemLoop_GetController.vi LinearSystemLoop_GetError_Single.vi LinearSystemLoop_GetFeedForward.vi LinearSystemLoop_GetNextR_Single.vi LinearSystemLoop_GetNextR_Single.vi LinearSystemLoop_GetNextR.vi LinearSystemLoop_GetNextR.vi LinearSystemLoop_GetNextR.vi LinearSystemLoop_GetObserver.vi LinearSystemLoop_GetObserver.vi LinearSystemLoop_GetObserver.vi LinearSystemLoop_GetObserver.vi LinearSystemLoop_GetObserver.vi LinearSystemLoop_GetObserver.vi LinearSystemLoop_GetObserver.vi LinearSystemLoop_GetObserver.vi	Notes	Code Review		Error Checking
LINEAR SYSTEM LOOF	X X X X X X X X X X X X X X X X X X X	X Documented X X Not WPILIB	X X X X X X X X X X X X X X X X X X X	Optimized S	Test Routine	LinearSystem_New.vi VI Name Function Prototype LinearSystemLoop_ClampInput.vi LinearSystemLoop_Correct.vi LinearSystemLoop_GetClampFunction.vi LinearSystemLoop_GetController.vi LinearSystemLoop_GetError_Single.vi LinearSystemLoop_GetError.vi LinearSystemLoop_GetFeedForward.vi LinearSystemLoop_GetNextR_Single.vi LinearSystemLoop_GetNextR_Single.vi LinearSystemLoop_GetNextR_Single.vi LinearSystemLoop_GetNextR_Single.vi LinearSystemLoop_GetNextR_Single.vi LinearSystemLoop_GetNextR_Single.vi LinearSystemLoop_GetNextR_Vi LinearSystemLoop_GetNextR_Vi LinearSystemLoop_GetObserver.vi	Notes	Code Review		Error Checking

X	X	X		LinearSystemLoop_GetXHat.vi
				Linear System Loop_New_BBB
				LinearSystemLoop_New_LinearSystem_ClampFunc
X	X	X		LinearSystemLoop_New_LinearSystem_ClampVal.vi
X	X	X		LinearSystemLoop_New.vi
X	X	X		LinearSystemLoop_Predict.vi
X	X	X		LinearSystemLoop_Reset.vi
				LinearSystemLoop_SetClampFunction.vi
				LinearSystemLoop_SetNextR_Some.vi
X	X	X		LinearSystemLoop_SetNextR.vi
				LinearSystemLoop_SetXHat_Single.vi
				LinearSystemLoop_SetXHat.vi

	Implemented	Documented	Not WPILIB	Menu Item	Execution Optimized	Test Routine	Sample Program	Function Prototype	Notes	Code Review	Test Program	Error Checking
LTV DIFFERENTIAL DRIVE CONTROLLER	Χ	Χ		X			LTVDiffDriveCtrl_Calculate.vi					
	Χ	Χ		X			LTVDiffDriveCtrl_New.vi					
	Χ	Χ		X			LTVDiffDriveCtrl_Calculate_TrajState.vi					
	Χ	Χ		X			LTVDiffDriveCtrl_Calculate_SetTolerance.vi					
	Χ	Χ		X			LTVDiffDriveCtrl_Calculate_AtReference.vi					

Implemented	Documented	Not WPILIB	Menu Item	Execution Optimize	Test Routine	Nample Program	Function Prototype	Notes	Code Review	Test Program	Error Checking
LTV UNICYCLE CONTROLLER X	Χ		X		Χ	LTVUnicycleCtrl_AtReference.vi					
X	X		Χ		Χ	LTVUnicycleCtrl_Calculate_TrajState.vi					
X	X		Χ		Χ	LTVUnicycleCtrl_Calculate.vi					
X	X		Χ		Χ	LTVUnicycleCtrl_New.vi					
X	X		Χ		Χ	LTVUnicycleCtrl_SetEnabled.vi					
X	X		Χ		Χ	LTVUnicycleCtrl_SetTolerance.vi					

'========= STATE SPACE UTILITIES '========

> Function Prototype Notes CALLBACK HELPER X X X X CallbackHelp_MatrixMinus.vi CallbackHelp_MatrixMult_CoerceSizeB.vi
> CallbackHelp_MatrixMult.vi
> CallbackHelp_MatrixPlus.vi

ntation update.	Implemented	Documented	Not WPILIB	Menu Item	Execution Optimized	Test Routine	Sample Program	Function Prototype	Notes	Code Review	Test Program	Error Checking
DISCRETIZATION	Χ	Χ		Χ		Χ	Discretization_DiscretizeA.vi					
	X	Χ		Χ		X	Discretization_DiscretizeAB.vi					
	Χ	Χ		Χ		Χ	Discretization_DiscretizeABTaylor.vi					
	X	Χ		X		X	Discretization_DiscretizeAQ.vi					
	X	Χ		X		X	Discretization_DiscretizeAQTaylor.vi					
	X	Χ		X			Discretization_DiscretizeR.vi					
					pəz							

	Implemented	Documented	Not WPILIB	Menu Item	Execution Optim	Test Routine	Sample Progran	Function Prototype	Notes	Code Review	Test Program	Error Checking
STATE SPACE UTIL	Χ	X	X	No			StateSpaceUtil_Check_Stabalizable.vi		Internal routine			
	Χ	Χ		X			StateSpaceUtil_ClampInputMaxMagnitude.vi		Routine exists, it is just a shell			
	X	X		X			StateSpaceUtil_IsDetectable.vi					
	Χ	Χ		X			StateSpaceUtil_IsStabalizable.vi					
	Χ	X		X		Χ	StateSpaceUtil_MakeCostMatrix.vi					
	Χ	Χ		X		Χ	StateSpaceUtil_MakeCovarianceMatrix.vi					
	Χ	X		X			StateSpaceUtil_MakeWhiteNoiseVector.vi					
	Χ	Χ		X			StateSpaceUtil_NomalizeInputVector.vi					
	Χ	X		X			StateSpaceUtil_PoseTo3dVector.vi					
	Χ	Χ		X			StateSpaceUtil_PoseTo4dVector.vi					
	Χ	Χ		X			StateSpaceUtil_PoseToVector.vi					

'========= SIMULATION '========

	Implemented	Documented	Not WPILIB	Menu Item	Execution Optimized	Test Routine	Sample Program	Function Prototype	Notes	Code Review	Test Program	Error Checking
BATTERY SIM	X	Χ		Χ	SI		BatterySim_CalculateDefaultBatteryLoadedVoltage.vi					
	Χ	Χ		X	SI		BatterySim_CalculateLoadedVoltage.vi					

	Implemented	Documented	Not WPILIB	Menu Item	Execution Optimizec	Test Routine	Sample Program	Function Prototype	Notes	Code Review	Test Program	Error Checking
DC MOTOR SIM	X	X		X			DCMotorSim_getAngularPositionRad.vi					
	X	X		X			DCMotorSim_getAngularPositionRotations.vi					
	X	Χ		Χ			DCMotorSim_getAngularVelocityRadPerSec.vi					
	X	Χ		Χ			DCMotorSim_getAngularVelocityRPM.vi					
	X	Χ		Χ			DCMotorSim_GetCurrentDrawAmps.vi					
	X	X		X			DCMotorSim_New_MOI.vi					
	X	X		X			DCMotorSim_New_Plant.vi					
	X	X		Χ			DCMotorSim_SetInputVoltage.vi					
	X	Χ		Χ			DCMotorSim_Update.vi					

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	mplemented	Documented	Not WPILIB	nu Item	Execution Optimized	Test Routine	SS Mple Program			de Review	t Program	
	dm'	õ	Vot	Menu	ii.	<i>T</i> es	S VI Name	Function Prototype	Notes	00 00	Test	
RENTIAL DRIVE TRAIN SIM	1 X			X			DiffDriveTrainSim_ClampInput.vi	71		T		Т
	X			X			DiffDriveTrainSim CreateKitbotSim EstMass.vi					
	X	X		X			DiffDriveTrainSim CreateKitbotSim EstMassMOI.vi					
	X	Χ		X			DiffDriveTrainSim CreateKitbotSim.vi					\top
	X			X			DiffDriveTrainSim_GetCurrentDrawAmps.vi					
	X	Χ		Х			DiffDriveTrainSim GetCurrentGearing.vi					
	X	Χ		X			DiffDriveTrainSim_GetDynamics.vi					
	X	Χ		X			DiffDriveTrainSim_GetHeading.vi					\Box
	X	Χ		X			DiffDriveTrainSim GetLeftCurrentDrawAmps.vi					Т
	X	X		X			DiffDriveTrainSim_GetLeftPositionMeters.vi					
	X	X		X			DiffDriveTrainSim_GetLeftVelocityMetersPerSecond.vi					
	X	X		X			DiffDriveTrainSim_GetOutput_Single.vi					
	X	X		X			DiffDriveTrainSim_GetPose.vi					
	X	Χ		Χ			DiffDriveTrainSim_GetRightCurrentDrawAmps.vi					
	X			Χ			DiffDriveTrainSim_GetRightPositionMeters.vi			'		
	X	Χ		Χ			DiffDriveTrainSim_GetRightVelocityMetersPerSecond.vi			'		
	X	Χ	L'	Χ			DiffDriveTrainSim_GetState_Single.vi					\perp
	Χ	Χ	L'	Χ			DiffDriveTrainSim_GetState.vi					\perp
	X	X	<u> </u>	X			DiffDriveTrainSim_KitBotWheelSize.vi					_
	Χ		 '	X			DiffDriveTrainSim_New_Mass_MOI.vi					_
	X	X	 '	X			DiffDriveTrainSim_New.vi					_
	X	X	<u></u> '	X			DiffDriveTrainSim_SetCurrentGearing.vi			 '		₩
	X	X	<u>'</u>	X			DiffDriveTrainSim_SetInputs.vi			+	\vdash	_
	X	X	<u>'</u>	X			DiffDriveTrainSim_SetPose.vi				\vdash	+-
	X	X	 '	X			DiffDriveTrainSim_SetState.vi			+		+
	X	X	<u></u>	X			DiffDriveTrainSim_ToughBoxMiniGearRatio.vi DiffDriveTrainSim_ToughBoxMiniMotor.vi			+	\vdash	+
	X	X	 '	X			DiffDriveTrainSim_ToughBoxWilliwiotor.vi			+		+
				-^-			Dilibrive trainoini_opuate.vi			+		+
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	lemented	umented	WPILIB	nu Item	7	t Routine	nple Program			le Review	t Program	
	mplemented	Jocumented	Vot WPILIB	Venu Item	7	Fest Routine	тріе і	Function Prototyne	Notes	<u>o</u>	Fest Program	
ELEVATOR SIM	Impleme	Docume	Not WPILIB	× Menu Item	Execution Optimized	Test Routine	ର ଆ ଆ S VI Name	Function Prototype	Notes	Code Review	Test Program	
ELEVATOR SIM	X Impleme	X Docume	Not WPILIB	X	7	Test Routine	୍ତ୍ର ଞ୍ଜି VI Name ElevatorSim_GetCurrentDraw.vi	Function Prototype	Notes	<u>o</u>	Test Program	
ELEVATOR SIM	X Impleme	X Docume	Not WPI	X	7	Test Routine	VI Name ElevatorSim_GetCurrentDraw.vi ElevatorSim_GetPositionMeters.vi	Function Prototype	Notes	<u>o</u>	Test Program	
ELEVATOR SIM	N X X	X Docume	Not WPI	X X X	7	Test Routine	VI Name ElevatorSim_GetCurrentDraw.vi ElevatorSim_GetPositionMeters.vi ElevatorSim_GetVelocityMetersPerSecond.vi	Function Prototype	Notes	<u>o</u>	Test Program	
ELEVATOR SIM	M X X X	X X X X	Not WPI	X X X	7	Test Routine	VI Name ElevatorSim_GetCurrentDraw.vi ElevatorSim_GetPositionMeters.vi ElevatorSim_GetVelocityMetersPerSecond.vi ElevatorSim_HasHitLowerLimit.vi	Function Prototype	Notes	<u>o</u>	Test Program	
ELEVATOR SIM	N X X	X X X X	Not WPI	X X X	7	Test Routine	VI Name ElevatorSim_GetCurrentDraw.vi ElevatorSim_GetPositionMeters.vi ElevatorSim_GetVelocityMetersPerSecond.vi ElevatorSim_HasHitLowerLimit.vi ElevatorSim_HasHitUpperLimit.vi	Function Prototype	Notes	<u>o</u>	Test Program	
ELEVATOR SIM	M X X X	X X X X	Not WPI	X X X	7	Test Routine	VI Name ElevatorSim_GetCurrentDraw.vi ElevatorSim_GetPositionMeters.vi ElevatorSim_GetVelocityMetersPerSecond.vi ElevatorSim_HasHitLowerLimit.vi ElevatorSim_HasHitUpperLimit.vi ElevatorSim_New_LinSys_NoNoise.vi ElevatorSim_New_LinSys.vi	Function Prototype	Notes	<u>o</u>	Test Program	
ELEVATOR SIM	M X X X	X X X X	Not WPI	X X X	7	Test Routine	VI Name ElevatorSim_GetCurrentDraw.vi ElevatorSim_GetPositionMeters.vi ElevatorSim_GetVelocityMetersPerSecond.vi ElevatorSim_HasHitLowerLimit.vi ElevatorSim_HasHitUpperLimit.vi	Function Prototype	Notes	<u>o</u>	Test Program	
ELEVATOR SIM	X X X X X	X X X X X X X X X X X X X X X X X X X	Not WPI	X X X X	7	Test Routine	VI Name ElevatorSim_GetCurrentDraw.vi ElevatorSim_GetPositionMeters.vi ElevatorSim_GetVelocityMetersPerSecond.vi ElevatorSim_HasHitLowerLimit.vi ElevatorSim_HasHitUpperLimit.vi ElevatorSim_New_LinSys_NoNoise.vi ElevatorSim_New_LinSys.vi	Function Prototype	Notes	<u>o</u>	Test Program	
ELEVATOR SIM	X X X X X X X X X X X X X X X X X X X	X X X X X	Not WP!	X X X X X X	7	Test Routine	VI Name ElevatorSim_GetCurrentDraw.vi ElevatorSim_GetPositionMeters.vi ElevatorSim_GetVelocityMetersPerSecond.vi ElevatorSim_HasHitLowerLimit.vi ElevatorSim_HasHitUpperLimit.vi ElevatorSim_New_LinSys_NoNoise.vi ElevatorSim_New_LinSys.vi ElevatorSim_New_NoNoise.vi ElevatorSim_New_NoNoise.vi ElevatorSim_New_NoNoise.vi ElevatorSim_New.vi ElevatorSim_RKF45_Func.vi	Function Prototype	Notes	<u>o</u>	Test Program	
ELEVATOR SIM	X X X X X X X X X X X X X X X X X X X	X X X X X X	Not WP!	X X X X X X No	7	Test Routine	VI Name ElevatorSim_GetCurrentDraw.vi ElevatorSim_GetPositionMeters.vi ElevatorSim_GetVelocityMetersPerSecond.vi ElevatorSim_HasHitLowerLimit.vi ElevatorSim_HasHitUpperLimit.vi ElevatorSim_New_LinSys_NoNoise.vi ElevatorSim_New_LinSys.vi ElevatorSim_New_NoNoise.vi ElevatorSim_New_NoNoise.vi ElevatorSim_New.vi ElevatorSim_RKF45_Func.vi ElevatorSim_SetInputVoltage.vi	Function Prototype	Notes	<u>o</u>	Test Program	
ELEVATOR SIM		X X X X X X X	Not WP!	X X X X X No	7	Test Routine	VI Name ElevatorSim_GetCurrentDraw.vi ElevatorSim_GetPositionMeters.vi ElevatorSim_GetVelocityMetersPerSecond.vi ElevatorSim_HasHitLowerLimit.vi ElevatorSim_HasHitUpperLimit.vi ElevatorSim_New_LinSys_NoNoise.vi ElevatorSim_New_LinSys.vi ElevatorSim_New_NoNoise.vi ElevatorSim_New_NoNoise.vi ElevatorSim_New.vi ElevatorSim_RKF45_Func.vi ElevatorSim_SetInputVoltage.vi ElevatorSim_SetState.vi	Function Prototype	Notes	<u>o</u>	Test Program	
ELEVATOR SIM	X X X X X X X X X X X X X X X X X X X	X X X X X X X	Not WP!	X X X X X No	7	Test Routine	VI Name ElevatorSim_GetCurrentDraw.vi ElevatorSim_GetPositionMeters.vi ElevatorSim_GetVelocityMetersPerSecond.vi ElevatorSim_HasHitLowerLimit.vi ElevatorSim_HasHitUpperLimit.vi ElevatorSim_New_LinSys_NoNoise.vi ElevatorSim_New_LinSys.vi ElevatorSim_New_NoNoise.vi ElevatorSim_New_NoNoise.vi ElevatorSim_New.vi ElevatorSim_RKF45_Func.vi ElevatorSim_SetInputVoltage.vi	Function Prototype	Needed because this doesn't	<u>o</u>	Test Program	
ELEVATOR SIM		X	Not WP!	X X X X X No X X	7	Test Routine	VI Name ElevatorSim_GetCurrentDraw.vi ElevatorSim_GetPositionMeters.vi ElevatorSim_GetVelocityMetersPerSecond.vi ElevatorSim_HasHitLowerLimit.vi ElevatorSim_HasHitUpperLimit.vi ElevatorSim_New_LinSys_NoNoise.vi ElevatorSim_New_LinSys.vi ElevatorSim_New_NoNoise.vi ElevatorSim_New.vi ElevatorSim_RKF45_Func.vi ElevatorSim_SetInputVoltage.vi ElevatorSim_SetState.vi ElevatorSim_Update.vi	Function Prototype		<u>o</u>	Test Program	
ELEVATOR SIM		X	Not WP!	X X X X X No	7	Test Routine	VI Name ElevatorSim_GetCurrentDraw.vi ElevatorSim_GetPositionMeters.vi ElevatorSim_GetVelocityMetersPerSecond.vi ElevatorSim_HasHitLowerLimit.vi ElevatorSim_HasHitUpperLimit.vi ElevatorSim_New_LinSys_NoNoise.vi ElevatorSim_New_LinSys.vi ElevatorSim_New_NoNoise.vi ElevatorSim_New_NoNoise.vi ElevatorSim_New.vi ElevatorSim_RKF45_Func.vi ElevatorSim_SetInputVoltage.vi ElevatorSim_SetState.vi	Function Prototype	Needed because this doesn't	<u>o</u>	Test Program	

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	Implemented	Documented	Not WPILIB	X Menu Item	Execution Optimized	Test Routine	Sample Program				Code Review	Test Program	Error Checking
i		Po	8	Me	Ĕ				Function Prototype	Notes	ပိ	7e	En
FLYWHEEL SIM		Χ		Χ				FlyWheelSim_GetAngularVelocityRadPerSec.vi					
	Χ	Χ		Χ				FlyWheelSim_GetAngularVelocityRPM.vi					
	Χ	X		Χ				FlyWheelSim_GetCurrentDrawAmps					
								FlyWheelSim_New_LinSys		Future			
								FlyWheelSim_New_LinSys_MOI_NoNoise		Future			
	V	Χ		V				FlyWheelSim_New_LinSys_NoNoise		Future			
	X	X		X				FlyWheelSim_New_MOI.vi FlyWheelSim_SetInput.vi					
	X	X		X				FlyWheelSim_SetState.vi					
	X	X		X				FlyWheelSim_Update.vi					
								Trywneeloni_opuale.vi					
!													
	Implemented	Documented	Not WPILIB	Menu Item	Execution Optimized	Test Routine	Sample Program				Code Review	st Program	or Checking
	Ĕ	Po	8	Ø	Ĕ	Ţ.	Sa	VI Name	Function Prototype	Notes	රි	Test	Error
LINEAR SYSTEM SIM	Χ	Χ		Χ				LinearSystemSim_ClampInput.vi					
								LinearSystemSim_GetCurrentDrawAmps.vi		DONT IMPLEMENT			
	Χ	Χ		Χ				LinearSystemSim_GetOutput_Single.vi					
	Χ	Χ		Χ				LinearSystemSim_GetOutput.vi					
	Χ	Χ		Χ				LinearSystemSim_New					
								LinearSystemSim_New_NoNoise.vi					
	X	X		X				LinearSystemSim_SetInput_Array.vi		Doesn't use clamp ?			
	X	X		X				LinearSystemSim_SetInput_Single.vi					
	X	X		X				LinearSystemSim_SetInput.vi					
	X	X		X				LinearSystemSim_Setstate.vi LinearSystemSim_Update.vi					
	X	X		No				LinearSystemSim_UpdateX.vi					
	X		X	No				LinearSystemSim_UpdateY.vi					
	^	^	^	NO				Linear System Sim_Opuate 1.vi					
	Implemented	Documented	Not WPILIB	Menu Item	Execution Optimized	Test Routine			Function Prototype	Notes	Code Review	Test Program	Error Checking
SINGLE JOINT ARM SIM		X		X				SngJntArmSim_EsitmateMOI.vi					
	X	X		X				SngJntArmSim_GetAngleRads.vi					
	X	X		X				SngJntArmSim_GetCurrentDraw.vi					
	X	X		X				SngJntArmSim_GetVelocityRadsPerSec.vi SngJntArmSim_HasHitLowerLimit.vi					
	X	X		X				SngJntArmSim_HasHitUpperLimit.vi					
	X	X		X				SngJntArmSim_New.vi					
	X	X		No				SngJntArmSim_Rkf45_Func.vi					
	X	X		X				SngJntArmSim_SetInputVoltage.vi					
	X	X		X				SngJntArmSim_SetState.vi					
	X	X		X				SngJntArmSim_Update.vi					
	Χ	Χ		Χ				SngJntArmSim_UpdateX.vi					
	Χ	Χ		Χ				SngJntArmSim_WouldHitLowerLimit.vi					
	Χ	Χ		Χ				SngJntArmSim_WouldHitUpperLimit.vi					

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MAT BUILDER	X X Implemented	X Documented	Not WPILIB	X Menu Item	일 Execution Optimized	Test Routine	VI Name Function Prototype MatBuilder_Create.vi MatBuilder Fill.vi	Notes	Code Review	Test Program	Error Checking
	^	^		^	31		WatDulidel_1 III.VI				
	Implemented	Documented	Not WPILIB	Menu Item	Execution Optimized	Test Routine Sample Program	VI Name Function Prototype	Notes	Code Review	Test Program	Error Checking
MATRIX	X	X		X	SI SI		Matrix_AssignBlock.vi Matrix Block.vi				
				^	- 0,		Matrix_ChangeBoundsUnchecked.vi				
	Χ	Χ		Χ	SI		Matrix_Create.vi				
							Matrix_Det.vi				
	Χ	Χ		Χ	SI		Matrix_Diag.vi Matrix Div Scalar.vi	labview has function			
							Matrix ElementPower.vi	labylew has function			
	Χ	Χ		Χ	SI		Matrix_ElementSum.vi				
							Matrix_ElementTimes.vi				
							Matrix_Equals.vi				
	X	X		X	SI		Matrix_Exp.vi Matrix ExtractColumnVector.vi				
	X	X		X	SI		Matrix ExtractFrom.vi				
	,,						Matrix_ExtractMatrix.vi				
	Χ	Χ		Χ	SI		Matrix_ExtractRowVector.vi				
	Χ	Χ		Χ	SI		Matrix_Fill.vi				
	Χ	Χ		Χ	1		Matrix_Get.vi Matrix Ident.vi	labview has function WPILIB calls this EYE			
	^	^		^			Matrix Inv.vi	WFILID Calls tills ETE			
	Χ	Χ		Χ	SI		Matrix IsEqual.vi				
							Matrix_IsIdentical.vi				
	Χ	Χ		Χ			Matrix_LLTDecompose.vi				
							Matrix MaxAbs.vi				
							Matrix_Mean.vi				
							Matrix MinInternal.vi				
							Matrix_Minus_Matrix.vi				
	~	~		X			Matrix_Minus_Scalar.vi Matrix_NormF.vi				
	Χ	Λ		^			Matrix_NormIndP1.vi				
							Matrix_Plus_Matrix.vi				
							Matrix_Plus_Scalar.vi				
	X	X		X	1		Matrix_Pow.vi	THIS NEEDS WORK!!!!			
		X		X	SI SI		Matrix_SetColumn.vi Matrix_SetRow.vi THERE ARE LOTS OF OTHER MATRIX FUNCTIONS THAT				
	^	^		^	31		SHOULD BE INCLUDED HERE FOR ISOLATION.				
							Matrix_Solve.vi				
							Matrix_Times_Matrix.vi				
							Matrix_Times_Scalar.vi Matrix_Trace.vi				
	X	X		X	SI		Matrix_Transpose.vi				
	X	X	Χ	X			Matrix_WithinTolerance.vi				

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/ – vi impiementation	LISI								-				
nentation update.					7								
SIMPLE MATRIX	X Implemented	X Documented	Not WPILIB	X Menu Item	Secution Optimized	Test Routine	Sample Program	VI Name SimpleMatrix_ExtractMatrix.vi	Function Prototype	Notes NOTE Matrix also has an ExtractMatrix with different calling parameters YUK.	Code Review	Test Program	Error Checking
MATRIX HELPER		X Documented	X Not WPILIB	X Menu Item	প্র ও Execution Optimized	Test Routine	Sample Program	VI Name MatrixHelper_CooerceSize.vi MatrixHelper MultCooerceBSize.vi	Function Prototype	Notes	Code Review	Test Program	Error Checking
	X	X	X	X	SI			MatrixHelper_Zero.vi					
VECTOR BUILDER	X X X X X X X X X X X X X X X X X X X	X X X X X X X X X X X X X X X X X X X	Not WPILIB	X X X X X X X X X X X X X X X X X X X	Solution Optimized	Test Routine	Sample Program	VI Name VecBuilder_1x1Fill.vi VecBuilder_2x1Fill.vi VecBuilder_3x1Fill.vi VecBuilder_4x1Fill.vi VecBuilder_5x1Fill.vi VecBuilder_6x1Fill.vi VecBuilder_6x1Fill.vi VecBuilder_7x1Fill.vi VecBuilder_8x1Fill.vi VecBuilder_9x1Fill.vi VecBuilder_ArrayBy1Fill.vi	Function Prototype	Notes	Code Review	Test Program	Error Checking
ANGLE STATISTICS	< Implemented	X Documented	X Not WPILIB	X Menu Item	X Execution Optimized	Test Routine	Sample Program	VI Name AngleStats_AngleAdd_CallbackHelp.vi	Function Prototype	Notes	Code Review	Test Program	Error Checking
ANGLE STATISTICS	X	X		X	1	Х		AngleStats_AngleAdd.vi					
	X	Χ	X	X	Χ			AngleStats_AngleMean_CallbackHelp.vi					
	X	Χ		X	1	Χ		AngleStats AngleMean.vi					
	X	X	X	X	X	V		AngleStats_AngleResidual_CallbackHelp.vi					
	X	X		X	1	X		AngleStats_AngleResidual.vi					

'========= MATH '=======

			pe								
Implemented	Not WPILIB	Menu Item		Test Routine	Sample Program	VI Name	Function Prototype	Notes	Code Review	Test Program	Error Checking
' X >	(X	SI			MathUtil_AngleModulus.vi	71			,	
		X				MathUtil_ApplyDeadband.vi					
			SI								
			51								
Implemented	Documented Not WPILIB	Menu Item	Execution Optimized	Test Routine	Sample Program	VI Name	Function Prototype	Notes	Code Review	Test Program	Error Checking
X	(X	I			MerweScSigPts_ComputeWeights.vi	7.		_		
X	(SI			MerweScSigPts_GetNumSigmas.vi					
			SI								
			SI			MerweScSigPts_GetWm_single.vi					
			1			MerweScSigPts New.vi					
			1								
plemented	ot WPILIB	enu Item		st Routine	ımple Progra				ode Review	st Program	Error Checking
				76			Function Prototype		_ Ŭ		Щ
			'					or abandoned???			
		X									
						NumIntegrate Rk4 Mat X.vi					
X	(No	SI			NumIntegrate_Rkdp_Func_A.vi					
X	(No	SI			NumIntegrate_Rkdp_Func_B1.vi					
			SI								
		NO X	1					New replacement for RKF45			
			SI					New replacement for title 45			
			SI		l	NumIntegrate Rkf45 Func B1.vi					
X	(No	SI			NumIntegrate_Rkf45_Func_B1B2.vi					
X	(No	SI								
						NumIntegrate_RKf45_Func_Bs.vi					
						NumIntegrate_RKf45_Func_Ch.vi		Removed. Replaced with newer			
						NumIntegrate_RKf45_Func_Ct.vi		Removed. Replaced with newer			
X	(No	1			NumIntegrate Rkf45 Impl vi		iunctions.			
			,					Note that this Feinberg method has			
S	X	X	X	X	Not WPILIB	Not WPILIB		Section Prototype Protot	Particle Prototype Notes Punction Prototype Notes	Bart Bart	B

					NumIntegrate_RKf45_New.vi	Removed. Never used.		
X	Χ	Χ	X	SI	NumIntegrate_Trap_Dbl.vi			
X	Χ	Χ	Χ	1	NumIntegrate_Trap_Mat.vi			
				zeq				
				ž.	<i>E</i>			

	Implemented	Documented	Not WPILIB	Menu Item	Execution Optim	Test Routine	Sample Progran	VI Name	Function Prototype	Notes	Code Review	Test Program	Error Checking
RUNGE KUTTA TIME VARYING	X	Χ		No				RungeKuttaTimeVarying_RK4_Mat_T_Y.vi					

Implemented Documented Not WPILIB Menu Item Execution Optimized	Test Routine Sample Program ample Program	Function Prototype	Notes	Code Review Test Program	Error Checking
NUMERICAL JACOBIAN X X X	NumJacobian_U.vi				
X X X	NumJacobian_X.vi				

	Implemented	Documented	Not WPILIB	Menu Item	Execution Optimized	Test Routine	Sample Program	Function Prototype	Notes	Code Review	Test Program	Error Checking
RICCATI	X	Χ		X			Riccati_Check_Detectable.vi		Routine exists, it is just a shell			
	X	Χ		X			Riccati_Check_Stabilizable.vi		Not really done !!!			
							Riccati_DARE_Choose.vi		Intended to allow DARE method testing.			
	X	Χ	Χ	Χ		Χ	Riccati_DARE_Iterate.vi		, and the second			
	X	Χ	Χ	Χ		X	Riccati_DARE_StructDoubling.vi					
	X	Χ		Χ			Riccati_DARE_N.vi					
	Χ	Χ		Χ		Χ	Riccati_DARE.vi					
	Χ	X		X			Riccati Input Check.vi					

'========= VISION '=======

	Implemented	Documented	Not WPILIB	Menu Item	Execution Optimized	Test Routine	Sample Program	VI Name	Function Prototype	Notes	Code Review	Test Program	Error Checking
COMPUTER VISION UTILITIES	X	Χ		Χ				CompVisionUtil_CalculateDistanceToTarget.vi					
	X	Χ		Χ				CompVisionUtil_EstimateCameraToTarget.vi					
	X	Χ		Χ				CompVisionUtil_EstimateFieldToCamera.vi					
	X	Χ		Χ				CompVisionUtil_EstimateFieldToRobot.vi					
	X	Χ		Χ				CompVisionUtil_EstimateFieldToRobot_Alt.vi					

'========= TYPE DEFINITIONS '======

te.					_					
					Optimized					
					ij.		E			
	Ø	Ø) bti	(I)	Program			
	Implemented	Documented	<u></u>	3		Routine	2			
	иe	nei	WPIL	ltem	ij.	Sol	Φ			
)ei	วก	7	Menu	Execution	st F	Sampl			
	TII	Ô	Not	ĕ	Ě	Test	Sai	VI Name	Function Prototype	Notes
TypeDef	Ζ	Ζ	Χ	X	N/A			ARM FF.CTL		
	Ζ	Ζ	Χ	Χ	N/A			BANG BANG.CTL		
	١		Χ	X	N/A			BICon-Matrix_FUNC_TYPE.CTL		NOT USED. Should this be
										deleted or abandoned???
	Z	Z	Χ	X	N/A			CALLBACK_FUNC_TYPE.CTL		
	Z	Z	Χ	Χ	N/A			CHASSIS_SPEEDS.CTL		
	Z	Z	X	X	N/A			CONTRAINED_STATE.CTL		
-	Z	Z	X	X	N/A			COORDINATE_AXIS.CTL		
-	Z	Z	X	X	N/A			COORDINATE_SYSTEM.CTL		
-	Z	Z	X	X	N/A N/A			DCMOTOR_TYPES_ENUM.CTL DCMOTOR.CTL		
F	Z	Z Z	X	X	N/A N/A			DCMOTOR SIM.CTL		
-	Z	Z	X	X	N/A			DEBOUNCER TYPE ENUM.Ctl		
-	Z	Z	X	\hat{X}	N/A			DEBOUNCER.CTL		
	Z	Z		\overline{X}	N/A			DIFF_DRIVE_ACCEL_LIMIT.CTL		
-	Z	Z	X	X	N/A			DIFF DRIVE KINEMATICS.CTL		
	Z	Z	X	X	N/A			DIFF DRIVE Kitbot WheelSize ENUM.ctl		
}	Z	Z	X	X	N/A			DiFF DRIVE Pose EST.ctl		
	Z	Z	X	X	N/A			DIFF_DRIVE_ToughBoxMini_GearChoice_ENUM.ctl		
	Z	Z	X	X	N/A			DIFF_DRIVE_ToughBoxMini_MotorChoice_ENUM.ctl		
	Z	Z	X	X	N/A			DIFF_DRIVE_TRAIN_SIM_STATE_ENUM.CTL		
	Ζ	Ζ	Χ	Χ	N/A			DIFF_DRIVE_TRAIN_SIM.ctl		
	Ζ	Ζ	Χ	Χ	NA			DISPLAY WAYPOINT.ctl		Was UTIL WAYPOINT.VI
	Ζ	Ζ	Χ	Χ	NA			DISPLAY_WEIGHTED_WAYPOINT.ctl		New V1.5. was
										UTIL_WEIGHTED_WAYPOINIT.VI
-	-	_			11/0			SLEW SE OT		
-	Z	Z	X	X	N/A N/A			ELEV_FF.CTL ELEVATOR SIM.CTL		
-	Z			X	N/A N/A			EXTENDED KALMAN CORRECT FUNC GROUP.CTL		
-	Z	Z	X	X	N/A N/A			EXTENDED_KALMAN_FILTER.CTL		
H	Z	Z	X	X	N/A			FLYWHEEL SIM.ctl		
H	Z	Z		\overline{X}	N/A			FUNCTION GENERATOR.ctl		
-	Z	Z	X	\dot{x}	N/A			FUNCTION GENERATOR MATRIX.ctl		
	Z	Z	X	\overline{X}	N/A			HOLONOMIC DRV CTRL.CTL		New 1/26/21
	Z	Z	X	X	N/A			TIME INTERPOLATABLE BOOLEAN.CTL		1720/21
ŀ	Z	Z	X	X	N/A			TIME INTERPOLATABLE DOUBLE.CTL		
		Z	X	X	N/A			TIME INTERPOLATABLE POSE2D.CTL		
	Z	Z	X	X	N/A			TIME INTERPOLATABLE ROTATION2D.CTL		
	Ζ	Ζ			N/A			KALMAN FILTER LATENCY COMP FUNC GROUP.CTL		
	Ζ	Ζ	X	Χ	N/A			KALMAN FILTER LATENCY COMP.CTL		
ļ	Ζ	Ζ	Χ	Χ	N/A			KALMAN_FILTER.ctl		
Ţ	Ζ	Ζ		Χ	N/A			LINEAR_FILTER.CTL		
Ţ	Z	Ζ	Χ	Χ	N/A			LINEAR_PLANT_INV_FF.ctl		
Ţ	Ζ	Ζ	Χ	Χ	N/A			LINEAR_QUADRATIC_REGULATOR.ctl		
	Ζ	Ζ	Χ	Χ	N/A			LINEAR_SYSTEM_LOOP.ctl		
	Ζ	Ζ	Χ	Χ	N/A			LINEAR_SYSTEM_SIM.ctl		
	Ζ	Ζ	Χ	Χ	N/A			LINEAR_SYSTEM.ctl		
	Ζ	Ζ	Χ	Χ	N/A			LTV_DIFF_DRIVE_CTRL.ctl		
	Z	Z	X	X	N/A			LTV_DIFF_DRIVE_CTRL_STATE_ENUM.ctl		
	Ζ	Ζ	Χ	Χ	N/A			LTV_UNICYCLE_CONTROLLER.CTL		
ļ	Z	Z	X	X	N/A			LTV_UNICYCLE_CONTROLLER_INPUT_ENUM.ctl		
,	Z	Z		X	N/A			LTV_UNICYCLE_CONTROLLER_STATE_ENUM.ctl		
-	Z	Z	X	X	N/A			MECA_DRIVE_KINEMATICS.CTL		
-	Z	Z	X	X	N/A			MECA_DRIVE_ODOMETRY.CTL		
}	Z	Z		X	N/A			MECA_DRIVE_POSE_EST.CTL		
}	Z	Z	X	X	N/A			MECA_WHEEL_SPEEDS.CTL		
}	<i>Z</i>	Z Z	X	X	N/A N/A			MEDIAN_FILTER.CTL MERWE SCALED SIGMA PTS.ctl		
-	Z		X	X	N/A N/A			MERWE_SCALED_SIGMA_PTS.cti OBSERVER_SNAP_LIST_ITEM.CTL		
-	Z	Z	X	X	N/A N/A			OBSERVER_SNAPSHOT.CTL		
L	_	4	^	^	IV/A			ODSERVER_SINAFSHOT.CIL		

Z	Ζ	Χ	X	N/A	PARAM STACK ITEM.CTL	
Z	Z	X		N/A	PARAM STACK.CTL	
Z	Z	X		N/A	PID ADV LIMITS.CTL	
Z	Z	X		N/A	PID ADV TUNING.CTL	
		X			PID CONTROLLER.CTL	
Z	Z					
Z	Z	X		N/A	PID_ERROR_TOLERANCE.CTL	
Z	Z	X		N/A	PID_INPUT_LIMITS.CTL	
Z	Ζ	X	Χ	N/A	PID_TUNING.CTL	
Z	Ζ	X	Χ		POSE2D.CTL	
Z	Ζ	X			POSE3D.CTL	
Z	Ζ	X		N/A	POSEwCURVATURE.CTL	
Z	Ζ	X		N/A	PROFILED_PID_CONTROLLER.CTL	
Z	Ζ	Χ		N/A	QUATERNION.CTL	
Z	Ζ	X	Χ	N/A	RAMSETE_EXE_TUNING.CTL	
Z	Ζ	X	Χ	N/A	RAMSETE.CTL	
Z	Ζ	X	Χ	N/A	ROTATION2D.CTL	
Z	Ζ	X	Χ	N/A	ROTATION3D.CTL	
Z	Ζ	Χ		N/A	SIMPLE MOTOR FF.CTL	
Z	Ζ	X		N/A	SINGLE JOINT ARM SIM.CTL	
Z	Z	X	X		SLEW RATE LIMITER.CTL	
Z	Z	X		N/A	SPLINE CTRL VECTOR.CTL	
Z	Z	X		N/A	SPLINE.CTL	
Z	Z	X	X	N/A	SWERVE DRIVE KINEMATICS.CTL	
Z	Z	X		N/A	SWERVE DRIVE MODULE STATE.CTL	
Z	Z	X		N/A	SWERVE DRIVE ODOMETRY.CTL	
Z	Z	X		N/A	SWERVE DRIVE Pose EST.CTL	
Z	Z	X		N/A	TIMER.CTL	
Z	Z	X			TRAJ CONFIG.CTL	
					TRAJ_CONFIG.CTL TRAJ_CONSTRAINT_CENTRIPETAL_ACCEL.CTL	
Z	Z	Χ				
Z	Z	X		N/A	TRAJ_CONSTRAINT_DIIF_DRIVE_KINEMATICS.CTL	
Z	Ζ	Χ	Χ	N/A	TRAJ_CONSTRAINT_DIIF_DRIVE_VOLTAGE.CTL	
		X	Χ	N/A N/A	TRAJ_CONSTRAINT_DIIF_DRIVE_VOLTAGE.CTL TRAJ_CONSTRAINT_ELLIP_REGION.CTL	
Z Z	Z Z	X X X	X	N/A N/A N/A	TRAJ_CONSTRAINT_DIIF_DRIVE_VOLTAGE.CTL TRAJ_CONSTRAINT_ELLIP_REGION.CTL TRAJ_CONSTRAINT_JERK.CTL	Routine exists, it is just a shell
Z	Z Z Z	X X X	X X	N/A N/A N/A N/A	TRAJ_CONSTRAINT_DIIF_DRIVE_VOLTAGE.CTL TRAJ_CONSTRAINT_ELLIP_REGION.CTL TRAJ_CONSTRAINT_JERK.CTL TRAJ_CONSTRAINT_MAX_VELOCITY.CTL	Routine exists, it is just a shell
Z Z \ Z Z	Z Z Z Z	X X X X	X X X X	N/A N/A N/A N/A N/A	TRAJ_CONSTRAINT_DIIF_DRIVE_VOLTAGE.CTL TRAJ_CONSTRAINT_ELLIP_REGION.CTL TRAJ_CONSTRAINT_JERK.CTL TRAJ_CONSTRAINT_MAX_VELOCITY.CTL TRAJ_CONSTRAINT_MECA_DRIVE_KINEMATICS.CTL	Routine exists, it is just a shell
Z Z \ \ Z Z Z	Z Z Z Z Z	X X X X X	X X X X	N/A N/A N/A N/A N/A N/A	TRAJ_CONSTRAINT_DIIF_DRIVE_VOLTAGE.CTL TRAJ_CONSTRAINT_ELLIP_REGION.CTL TRAJ_CONSTRAINT_JERK.CTL TRAJ_CONSTRAINT_MAX_VELOCITY.CTL TRAJ_CONSTRAINT_MECA_DRIVE_KINEMATICS.CTL TRAJ_CONSTRAINT_MINMAX.CTL	Routine exists, it is just a shell
Z Z V Z Z Z Z	Z Z Z Z Z Z	X X X X X X	X X X X X	N/A N/A N/A N/A N/A N/A N/A	TRAJ_CONSTRAINT_DIIF_DRIVE_VOLTAGE.CTL TRAJ_CONSTRAINT_ELLIP_REGION.CTL TRAJ_CONSTRAINT_JERK.CTL TRAJ_CONSTRAINT_MAX_VELOCITY.CTL TRAJ_CONSTRAINT_MECA_DRIVE_KINEMATICS.CTL TRAJ_CONSTRAINT_MINMAX.CTL TRAJ_CONSTRAINT_RECT_REGION.CTL	Routine exists, it is just a shell
Z Z Z Z Z Z Z	Z Z Z Z Z Z Z Z Z Z Z	X X X X X X X	X X X X X X	N/A N/A N/A N/A N/A N/A N/A N/A	TRAJ_CONSTRAINT_DIIF_DRIVE_VOLTAGE.CTL TRAJ_CONSTRAINT_ELLIP_REGION.CTL TRAJ_CONSTRAINT_JERK.CTL TRAJ_CONSTRAINT_MAX_VELOCITY.CTL TRAJ_CONSTRAINT_MECA_DRIVE_KINEMATICS.CTL TRAJ_CONSTRAINT_MINMAX.CTL TRAJ_CONSTRAINT_RECT_REGION.CTL TRAJ_CONSTRAINT_SWERVE_DRIVE_KINEMATICS.CTL	Routine exists, it is just a shell
Z Z Z Z Z Z Z Z	Z Z Z Z Z Z Z Z Z Z Z Z	X X X X X X X X	X X X X X X	N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A	TRAJ_CONSTRAINT_DIIF_DRIVE_VOLTAGE.CTL TRAJ_CONSTRAINT_ELLIP_REGION.CTL TRAJ_CONSTRAINT_JERK.CTL TRAJ_CONSTRAINT_MAX_VELOCITY.CTL TRAJ_CONSTRAINT_MECA_DRIVE_KINEMATICS.CTL TRAJ_CONSTRAINT_MINMAX.CTL TRAJ_CONSTRAINT_RECT_REGION.CTL TRAJ_CONSTRAINT_SWERVE_DRIVE_KINEMATICS.CTL TRAJ_CONSTRAINT_SWERVE_DRIVE_KINEMATICS.CTL TRAJ_STATE.CTL	Routine exists, it is just a shell
Z Z Z Z Z Z Z Z Z Z	Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	X X X X X X X X	X X X X X X X	N/A	TRAJ_CONSTRAINT_DIIF_DRIVE_VOLTAGE.CTL TRAJ_CONSTRAINT_ELLIP_REGION.CTL TRAJ_CONSTRAINT_JERK.CTL TRAJ_CONSTRAINT_MAX_VELOCITY.CTL TRAJ_CONSTRAINT_MECA_DRIVE_KINEMATICS.CTL TRAJ_CONSTRAINT_MINMAX.CTL TRAJ_CONSTRAINT_RECT_REGION.CTL TRAJ_CONSTRAINT_SWERVE_DRIVE_KINEMATICS.CTL TRAJ_CONSTRAINT_SWERVE_DRIVE_KINEMATICS.CTL TRAJ_STATE.CTL TRAJECTORY_SPLINE_TYPE_ENUM.CTL	Routine exists, it is just a shell
Z Z Z Z Z Z Z Z Z	Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	X X X X X X X X X	X X X X X X X X	N/A	TRAJ_CONSTRAINT_DIIF_DRIVE_VOLTAGE.CTL TRAJ_CONSTRAINT_ELLIP_REGION.CTL TRAJ_CONSTRAINT_JERK.CTL TRAJ_CONSTRAINT_MAX_VELOCITY.CTL TRAJ_CONSTRAINT_MECA_DRIVE_KINEMATICS.CTL TRAJ_CONSTRAINT_MINMAX.CTL TRAJ_CONSTRAINT_RECT_REGION.CTL TRAJ_CONSTRAINT_SWERVE_DRIVE_KINEMATICS.CTL TRAJ_CONSTRAINT_SWERVE_DRIVE_KINEMATICS.CTL TRAJ_STATE.CTL TRAJECTORY_SPLINE_TYPE_ENUM.CTL TRAJECTORY.CTL	Routine exists, it is just a shell
Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	X X X X X X X X X X	X X X X X X X X X	N/A	TRAJ_CONSTRAINT_DIIF_DRIVE_VOLTAGE.CTL TRAJ_CONSTRAINT_ELLIP_REGION.CTL TRAJ_CONSTRAINT_JERK.CTL TRAJ_CONSTRAINT_MAX_VELOCITY.CTL TRAJ_CONSTRAINT_MECA_DRIVE_KINEMATICS.CTL TRAJ_CONSTRAINT_MINMAX.CTL TRAJ_CONSTRAINT_RECT_REGION.CTL TRAJ_CONSTRAINT_SWERVE_DRIVE_KINEMATICS.CTL TRAJ_CONSTRAINT_SWERVE_DRIVE_KINEMATICS.CTL TRAJ_STATE.CTL TRAJECTORY_SPLINE_TYPE_ENUM.CTL TRAJECTORY.CTL TRANSFORM2D.CTL	Routine exists, it is just a shell
Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	X X X X X X X X X X X	X X X X X X X X X	N/A	TRAJ_CONSTRAINT_DIIF_DRIVE_VOLTAGE.CTL TRAJ_CONSTRAINT_ELLIP_REGION.CTL TRAJ_CONSTRAINT_JERK.CTL TRAJ_CONSTRAINT_MAX_VELOCITY.CTL TRAJ_CONSTRAINT_MECA_DRIVE_KINEMATICS.CTL TRAJ_CONSTRAINT_MINMAX.CTL TRAJ_CONSTRAINT_RECT_REGION.CTL TRAJ_CONSTRAINT_SWERVE_DRIVE_KINEMATICS.CTL TRAJ_STATE.CTL TRAJ_STATE.CTL TRAJECTORY_SPLINE_TYPE_ENUM.CTL TRAJECTORY.CTL TRANSFORM2D.CTL TRANSFORM3D.CTL	Routine exists, it is just a shell
Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	X X X X X X X X X X X X X	X X X X X X X X X X X	N/A	TRAJ_CONSTRAINT_DIIF_DRIVE_VOLTAGE.CTL TRAJ_CONSTRAINT_ELLIP_REGION.CTL TRAJ_CONSTRAINT_JERK.CTL TRAJ_CONSTRAINT_MAX_VELOCITY.CTL TRAJ_CONSTRAINT_MECA_DRIVE_KINEMATICS.CTL TRAJ_CONSTRAINT_MINMAX.CTL TRAJ_CONSTRAINT_RECT_REGION.CTL TRAJ_CONSTRAINT_SWERVE_DRIVE_KINEMATICS.CTL TRAJ_CONSTRAINT_SWERVE_DRIVE_KINEMATICS.CTL TRAJ_STATE.CTL TRAJECTORY_SPLINE_TYPE_ENUM.CTL TRAJECTORY.CTL TRANSFORM2D.CTL TRANSFORM3D.CTL TRANSLATION2D.CTL	Routine exists, it is just a shell
Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	X X X X X X X X X X X X X X X X X X	X X X X X X X X X X X X	N/A	TRAJ_CONSTRAINT_DIIF_DRIVE_VOLTAGE.CTL TRAJ_CONSTRAINT_ELLIP_REGION.CTL TRAJ_CONSTRAINT_JERK.CTL TRAJ_CONSTRAINT_MAX_VELOCITY.CTL TRAJ_CONSTRAINT_MECA_DRIVE_KINEMATICS.CTL TRAJ_CONSTRAINT_MINMAX.CTL TRAJ_CONSTRAINT_RECT_REGION.CTL TRAJ_CONSTRAINT_SWERVE_DRIVE_KINEMATICS.CTL TRAJ_STATE.CTL TRAJ_STATE.CTL TRAJECTORY_SPLINE_TYPE_ENUM.CTL TRAJECTORY.CTL TRANSFORM2D.CTL TRANSFORM3D.CTL	Routine exists, it is just a shell
Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	X X X X X X X X X X X X X	X X X X X X X X X X X X X X X X X X X	N/A	TRAJ_CONSTRAINT_DIIF_DRIVE_VOLTAGE.CTL TRAJ_CONSTRAINT_ELLIP_REGION.CTL TRAJ_CONSTRAINT_JERK.CTL TRAJ_CONSTRAINT_MAX_VELOCITY.CTL TRAJ_CONSTRAINT_MECA_DRIVE_KINEMATICS.CTL TRAJ_CONSTRAINT_MINMAX.CTL TRAJ_CONSTRAINT_RECT_REGION.CTL TRAJ_CONSTRAINT_SWERVE_DRIVE_KINEMATICS.CTL TRAJ_CONSTRAINT_SWERVE_DRIVE_KINEMATICS.CTL TRAJ_STATE.CTL TRAJECTORY_SPLINE_TYPE_ENUM.CTL TRAJECTORY.CTL TRANSFORM2D.CTL TRANSFORM3D.CTL TRANSLATION2D.CTL	Routine exists, it is just a shell
Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	X X X X X X X X X X X X X X X X X X	X X X X X X X X X X X X X X X X X X X	N/A	TRAJ_CONSTRAINT_DIIF_DRIVE_VOLTAGE.CTL TRAJ_CONSTRAINT_ELLIP_REGION.CTL TRAJ_CONSTRAINT_JERK.CTL TRAJ_CONSTRAINT_MAX_VELOCITY.CTL TRAJ_CONSTRAINT_MECA_DRIVE_KINEMATICS.CTL TRAJ_CONSTRAINT_MINMAX.CTL TRAJ_CONSTRAINT_RECT_REGION.CTL TRAJ_CONSTRAINT_SWERVE_DRIVE_KINEMATICS.CTL TRAJ_STATE.CTL TRAJECTORY_SPLINE_TYPE_ENUM.CTL TRAJECTORY_CTL TRANSFORM2D.CTL TRANSFORM3D.CTL TRANSLATION2D.CTL TRANSLATION3D.CTL	Routine exists, it is just a shell
Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	X X X X X X X X X X X X X X X X X	X X X X X X X X X X X X X X X X X X X	N/A	TRAJ_CONSTRAINT_DIIF_DRIVE_VOLTAGE.CTL TRAJ_CONSTRAINT_ELLIP_REGION.CTL TRAJ_CONSTRAINT_JERK.CTL TRAJ_CONSTRAINT_MAX_VELOCITY.CTL TRAJ_CONSTRAINT_MECA_DRIVE_KINEMATICS.CTL TRAJ_CONSTRAINT_MINMAX.CTL TRAJ_CONSTRAINT_RECT_REGION.CTL TRAJ_CONSTRAINT_SWERVE_DRIVE_KINEMATICS.CTL TRAJ_STATE.CTL TRAJECTORY_SPLINE_TYPE_ENUM.CTL TRAJECTORY_SPLINE_TYPE_ENUM.CTL TRANSFORM2D.CTL TRANSFORM3D.CTL TRANSLATION2D.CTL TRANSLATION3D.CTL TRAPEZOID_PROFILE_CONSTRAINT.CTL	Routine exists, it is just a shell
Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	X X X X X X X X X X X X X X X X X X X	X X X X X X X X X X X X X X X X X X X	N/A	TRAJ_CONSTRAINT_DIIF_DRIVE_VOLTAGE.CTL TRAJ_CONSTRAINT_ELLIP_REGION.CTL TRAJ_CONSTRAINT_JERK.CTL TRAJ_CONSTRAINT_MAX_VELOCITY.CTL TRAJ_CONSTRAINT_MECA_DRIVE_KINEMATICS.CTL TRAJ_CONSTRAINT_MINMAX.CTL TRAJ_CONSTRAINT_RECT_REGION.CTL TRAJ_CONSTRAINT_SWERVE_DRIVE_KINEMATICS.CTL TRAJ_STATE.CTL TRAJECTORY_SPLINE_TYPE_ENUM.CTL TRAJECTORY_SPLINE_TYPE_ENUM.CTL TRANSFORM2D.CTL TRANSFORM3D.CTL TRANSLATION2D.CTL TRANSLATION3D.CTL TRAPEZOID_PROFILE_CONSTRAINT.CTL TRAPEZOID_PROFILE_STATE.CTL	Routine exists, it is just a shell
Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	X X X X X X X X X X X X X X X X X X X	X X X X X X X X X X X X X X X X X X X	N/A	TRAJ_CONSTRAINT_DIIF_DRIVE_VOLTAGE.CTL TRAJ_CONSTRAINT_ELLIP_REGION.CTL TRAJ_CONSTRAINT_JERK.CTL TRAJ_CONSTRAINT_MAX_VELOCITY.CTL TRAJ_CONSTRAINT_MECA_DRIVE_KINEMATICS.CTL TRAJ_CONSTRAINT_MINMAX.CTL TRAJ_CONSTRAINT_RECT_REGION.CTL TRAJ_CONSTRAINT_SWERVE_DRIVE_KINEMATICS.CTL TRAJ_STATE.CTL TRAJECTORY_SPLINE_TYPE_ENUM.CTL TRAJECTORY_SPLINE_TYPE_ENUM.CTL TRANSFORM2D.CTL TRANSFORM3D.CTL TRANSLATION2D.CTL TRANSLATION3D.CTL TRAPEZOID_PROFILE_CONSTRAINT.CTL TRAPEZOID_PROFILE_STATE.CTL TRAPEZOID_PROFILE_STATE.CTL	Routine exists, it is just a shell
Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	X X X X X X X X X X X X X X X X X X X	X X X X X X X X X X X X X X X X X X X	N/A	TRAJ_CONSTRAINT_DIIF_DRIVE_VOLTAGE.CTL TRAJ_CONSTRAINT_ELLIP_REGION.CTL TRAJ_CONSTRAINT_JERK.CTL TRAJ_CONSTRAINT_MAX_VELOCITY.CTL TRAJ_CONSTRAINT_MECA_DRIVE_KINEMATICS.CTL TRAJ_CONSTRAINT_MINMAX.CTL TRAJ_CONSTRAINT_RECT_REGION.CTL TRAJ_CONSTRAINT_SWERVE_DRIVE_KINEMATICS.CTL TRAJ_CONSTRAINT_SWERVE_DRIVE_KINEMATICS.CTL TRAJ_STATE.CTL TRAJECTORY_SPLINE_TYPE_ENUM.CTL TRAJECTORY_SPLINE_TYPE_ENUM.CTL TRANSFORM2D.CTL TRANSFORM3D.CTL TRANSLATION2D.CTL TRANSLATION3D.CTL TRAPEZOID_PROFILE_CONSTRAINT.CTL TRAPEZOID_PROFILE_STATE.CTL TRAPEZOID_PROFILE_STATE.CTL TWIST2D.CTL TWIST3D.CTL	Routine exists, it is just a shell
Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	X X X X X X X X X X X X X X X X X X X	X X X X X X X X X X X X X X X X X X X	N/A	TRAJ_CONSTRAINT_DIIF_DRIVE_VOLTAGE.CTL TRAJ_CONSTRAINT_ELLIP_REGION.CTL TRAJ_CONSTRAINT_JERK.CTL TRAJ_CONSTRAINT_MAX_VELOCITY.CTL TRAJ_CONSTRAINT_MECA_DRIVE_KINEMATICS.CTL TRAJ_CONSTRAINT_MINMAX.CTL TRAJ_CONSTRAINT_RECT_REGION.CTL TRAJ_CONSTRAINT_SWERVE_DRIVE_KINEMATICS.CTL TRAJ_STATE.CTL TRAJ_ECTORY_SPLINE_TYPE_ENUM.CTL TRAJECTORY_SPLINE_TYPE_ENUM.CTL TRANSFORM2D.CTL TRANSFORM3D.CTL TRANSLATION2D.CTL TRANSLATION3D.CTL TRAPEZOID_PROFILE_CONSTRAINT.CTL TRAPEZOID_PROFILE_STATE.CTL TRAPEZOID_PROFILE_CTL TWIST2D.CTL TWIST2D.CTL TWIST3D.CTL UNSCENTED_KALMAN_CORRECT_FUNC_GROUP.CTL	Routine exists, it is just a shell
Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	X X X X X X X X X X X X X X	X X X X X X X X X X X X X X X X X X X	N/A	TRAJ_CONSTRAINT_DIIF_DRIVE_VOLTAGE.CTL TRAJ_CONSTRAINT_ELLIP_REGION.CTL TRAJ_CONSTRAINT_JERK.CTL TRAJ_CONSTRAINT_MAX_VELOCITY.CTL TRAJ_CONSTRAINT_MECA_DRIVE_KINEMATICS.CTL TRAJ_CONSTRAINT_MINMAX.CTL TRAJ_CONSTRAINT_RECT_REGION.CTL TRAJ_CONSTRAINT_SWERVE_DRIVE_KINEMATICS.CTL TRAJ_CONSTRAINT_SWERVE_DRIVE_KINEMATICS.CTL TRAJ_STATE.CTL TRAJECTORY_SPLINE_TYPE_ENUM.CTL TRAJECTORY_SPLINE_TYPE_ENUM.CTL TRANSFORM2D.CTL TRANSFORM3D.CTL TRANSFORM3D.CTL TRANSLATION2D.CTL TRANSLATION3D.CTL TRAPEZOID_PROFILE_CONSTRAINT.CTL TRAPEZOID_PROFILE_STATE.CTL TWIST2D.CTL TWIST2D.CTL TWIST3D.CTL UNSCENTED_KALMAN_CORRECT_FUNC_GROUP.CTL UNSCENTED_KALMAN_FILTER.ctl	Routine exists, it is just a shell
Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	X X X X X X X X X X X X X X	X X X X X X X X X X X X X X X X X X X	N/A	TRAJ_CONSTRAINT_DIIF_DRIVE_VOLTAGE.CTL TRAJ_CONSTRAINT_ELLIP_REGION.CTL TRAJ_CONSTRAINT_JERK.CTL TRAJ_CONSTRAINT_MAX_VELOCITY.CTL TRAJ_CONSTRAINT_MECA_DRIVE_KINEMATICS.CTL TRAJ_CONSTRAINT_MINMAX.CTL TRAJ_CONSTRAINT_RECT_REGION.CTL TRAJ_CONSTRAINT_SWERVE_DRIVE_KINEMATICS.CTL TRAJ_CONSTRAINT_SWERVE_DRIVE_KINEMATICS.CTL TRAJ_STATE.CTL TRAJECTORY_SPLINE_TYPE_ENUM.CTL TRAJECTORY_CTL TRANSFORM2D.CTL TRANSFORM3D.CTL TRANSLATION2D.CTL TRANSLATION3D.CTL TRAPEZOID_PROFILE_CONSTRAINT.CTL TRAPEZOID_PROFILE_STATE.CTL TRAPEZOID_PROFILE_STATE.CTL TWIST2D.CTL TWIST3D.CTL UNSCENTED_KALMAN_CORRECT_FUNC_GROUP.CTL UNSCENTED_KALMAN_NEW_FUNC_GROUP.CTL	Routine exists, it is just a shell
Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	X X X X X X X X X X X X X X	X X X X X X X X X X X X X X X X X X X	N/A	TRAJ_CONSTRAINT_DIIF_DRIVE_VOLTAGE.CTL TRAJ_CONSTRAINT_ELLIP_REGION.CTL TRAJ_CONSTRAINT_JERK.CTL TRAJ_CONSTRAINT_MAX_VELOCITY.CTL TRAJ_CONSTRAINT_MECA_DRIVE_KINEMATICS.CTL TRAJ_CONSTRAINT_MINMAX.CTL TRAJ_CONSTRAINT_RECT_REGION.CTL TRAJ_CONSTRAINT_SWERVE_DRIVE_KINEMATICS.CTL TRAJ_CONSTRAINT_SWERVE_DRIVE_KINEMATICS.CTL TRAJ_STATE.CTL TRAJECTORY_SPLINE_TYPE_ENUM.CTL TRAJECTORY_SPLINE_TYPE_ENUM.CTL TRANSFORM2D.CTL TRANSFORM3D.CTL TRANSLATION2D.CTL TRANSLATION3D.CTL TRAPEZOID_PROFILE_CONSTRAINT.CTL TRAPEZOID_PROFILE_STATE.CTL TRAPEZOID_PROFILE_STATE.CTL TWIST2D.CTL TWIST3D.CTL UNSCENTED_KALMAN_CORRECT_FUNC_GROUP.CTL UNSCENTED_KALMAN_FILTER.ctl UNSCENTED_KALMAN_NEW_FUNC_GROUP.CTL UTIL_PATHFINDER_CONFIG.CTL	
Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	X X X X X X X X X X X X X X	X X X X X X X X X X X X X X X X X X X	N/A	TRAJ_CONSTRAINT_DIIF_DRIVE_VOLTAGE.CTL TRAJ_CONSTRAINT_ELLIP_REGION.CTL TRAJ_CONSTRAINT_JERK.CTL TRAJ_CONSTRAINT_MAX_VELOCITY.CTL TRAJ_CONSTRAINT_MECA_DRIVE_KINEMATICS.CTL TRAJ_CONSTRAINT_MINMAX.CTL TRAJ_CONSTRAINT_RECT_REGION.CTL TRAJ_CONSTRAINT_SWERVE_DRIVE_KINEMATICS.CTL TRAJ_CONSTRAINT_SWERVE_DRIVE_KINEMATICS.CTL TRAJ_STATE.CTL TRAJECTORY_SPLINE_TYPE_ENUM.CTL TRAJECTORY_CTL TRANSFORM2D.CTL TRANSFORM3D.CTL TRANSLATION2D.CTL TRANSLATION3D.CTL TRAPEZOID_PROFILE_CONSTRAINT.CTL TRAPEZOID_PROFILE_STATE.CTL TWIST2D.CTL TWIST2D.CTL TWIST3D.CTL UNSCENTED_KALMAN_CORRECT_FUNC_GROUP.CTL UNSCENTED_KALMAN_FILTER.ctl UNSCENTED_KALMAN_NEW_FUNC_GROUP.CTL UTIL_PATHFINDER_CONFIG.CTL	Delete – obsolete
Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	X X X X X X X X X X X X X X	X X X X X X X X X X X X X X X X X X X	N/A	TRAJ_CONSTRAINT_DIIF_DRIVE_VOLTAGE.CTL TRAJ_CONSTRAINT_ELLIP_REGION.CTL TRAJ_CONSTRAINT_JERK.CTL TRAJ_CONSTRAINT_MAX_VELOCITY.CTL TRAJ_CONSTRAINT_MECA_DRIVE_KINEMATICS.CTL TRAJ_CONSTRAINT_MINMAX.CTL TRAJ_CONSTRAINT_RECT_REGION.CTL TRAJ_CONSTRAINT_SWERVE_DRIVE_KINEMATICS.CTL TRAJ_CONSTRAINT_SWERVE_DRIVE_KINEMATICS.CTL TRAJ_STATE.CTL TRAJECTORY_SPLINE_TYPE_ENUM.CTL TRAJECTORY_SPLINE_TYPE_ENUM.CTL TRANSFORM2D.CTL TRANSFORM3D.CTL TRANSFORM3D.CTL TRANSLATION2D.CTL TRANSLATION3D.CTL TRAPEZOID_PROFILE_CONSTRAINT.CTL TRAPEZOID_PROFILE_STATE.CTL TWIST2D.CTL TWIST2D.CTL TWIST3D.CTL UNSCENTED_KALMAN_CORRECT_FUNC_GROUP.CTL UNSCENTED_KALMAN_FILTER.ctl UNSCENTED_KALMAN_NEW_FUNC_GROUP.CTL UTIL_PATHFINDER_CONFIG.CTL WAYPOINTS.CTL WEIGHTED_WAYPOINT.CTL	Delete – obsolete New V1.5
Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	X X X X X X X X X X X X X X	X X X X X X X X X X X X X X X X X X X	N/A	TRAJ_CONSTRAINT_DIIF_DRIVE_VOLTAGE.CTL TRAJ_CONSTRAINT_ELLIP_REGION.CTL TRAJ_CONSTRAINT_JERK.CTL TRAJ_CONSTRAINT_MAX_VELOCITY.CTL TRAJ_CONSTRAINT_MECA_DRIVE_KINEMATICS.CTL TRAJ_CONSTRAINT_MINMAX.CTL TRAJ_CONSTRAINT_RECT_REGION.CTL TRAJ_CONSTRAINT_SWERVE_DRIVE_KINEMATICS.CTL TRAJ_CONSTRAINT_SWERVE_DRIVE_KINEMATICS.CTL TRAJ_STATE.CTL TRAJECTORY_SPLINE_TYPE_ENUM.CTL TRAJECTORY_CTL TRANSFORM2D.CTL TRANSFORM3D.CTL TRANSLATION2D.CTL TRANSLATION3D.CTL TRAPEZOID_PROFILE_CONSTRAINT.CTL TRAPEZOID_PROFILE_STATE.CTL TWIST2D.CTL TWIST2D.CTL TWIST3D.CTL UNSCENTED_KALMAN_CORRECT_FUNC_GROUP.CTL UNSCENTED_KALMAN_FILTER.ctl UNSCENTED_KALMAN_NEW_FUNC_GROUP.CTL UTIL_PATHFINDER_CONFIG.CTL	Delete – obsolete

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