

CM RTCESL 4.6.2 Release Notes

1 Overview

These release notes are for the Arm Cortex-M0+, Cortex-M4(F), Cortex-M7(F), and Cortex-M33(F) Real-Time Control Embedded Software Libraries release 4.6.2.

The purpose of this release is the MISRA-compliant code update and to extend the RAM relocation feature to the Cortex-M7 core-based library.

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2 What is new

The code was updated to be MISRA-compliant. The RAM relocation feature is extended to the Cortex-M7 core based library.

3 Description

This release of RTCESL supports the following platforms:

- Arm Cortex-M0+ (the MMDVVSQ peripheral is optional).
- Arm Cortex-M33 requires the DSP extension.
- Arm Cortex-M33F requires the DSP extension and the FPU.
- Arm Cortex-M4 requires the DSP extension.
- Arm Cortex-M4F requires the DSP extension and the FPU.
- Arm Cortex-M7 requires the DSP extension.
- Arm Cortex-M7F requires the DSP extension and the FPU.

It contains the following libraries:

- MLIB
- GFLIB
- GDFLIB
- GMCLIB
- AMCLIB
- PCLIB

It is compiled using the following IDEs:

- MCUX 11.4.0 [Build 6135] IDE.
- IAR 9.10.1 IDE.
- Keil 5.32.0.7 IDE.

The following optimization is used:

- The accuracy is not guaranteed for some of the float functions in this version.
- The maximum speed optimization is used for all libraries on all compilers, except for AMCLIB and GFLIB for the CM7F and CM7 cores. They have the optimization level decreased to O0 or O1.

The following algorithms are in the release for the CM33(F), CM4(F), and CM7(F) cores (16-/32-bit fixed-point and 32-bit single-precision floating-point):

AMCLIB_ACIMCtrlMTPAInit_FLT	GDFLIB_FilterMA_FLT
AMCLIB_ACIMCtrlMTPA_FLT	
AMCLIB_ACIMRotFluxObsrvInit_FLT	GFLIB_Acos_F16
AMCLIB_ACIMRotFluxObsrv_FLT	GFLIB_Acos_FLT
AMCLIB_ACIMSpeedMRASInit_FLT	GFLIB_Asin_F16
AMCLIB_ACIMSpeedMRAS_FLT	GFLIB_Asin_FLT
AMCLIB_AngleTrackObsrvInit_A32	GFLIB_AtanYX_A32f
AMCLIB_AngleTrackObsrvInit_F16	GFLIB_AtanYX_F16
AMCLIB_AngleTrackObsrv_A32ff	GFLIB_AtanYX_FLT
AMCLIB_AngleTrackObsrv_F16	GFLIB_Atan_A32f
AMCLIB_CtrlFluxWkngInit_F16	GFLIB_Atan_F16
AMCLIB_CtrlFluxWkngInit_FLT	GFLIB_Atan_FLT
AMCLIB_CtrlFluxWkng_F16	GFLIB_Cos_F16
AMCLIB_CtrlFluxWkng_FLT	GFLIB_Cos_FLT
AMCLIB_PMSMBemfObsrvABInit_F16	GFLIB_Cos_FLTa
AMCLIB_PMSMBemfObsrvABInit_FLT	GFLIB_CtrlBetaIPDpAWInit_F16
AMCLIB_PMSMBemfObsrvAB_F16	GFLIB_CtrlBetaIPDpAWInit_FLT
AMCLIB_PMSMBemfObsrvAB_FLT	GFLIB_CtrlBetaIPDpAW_F16
AMCLIB_PMSMBemfObsrvDQInit_A32fff	GFLIB_CtrlBetaIPDpAW_FLT
AMCLIB_PMSMBemfObsrvDQInit_F16	GFLIB_CtrlBetaIPpAWInit_F16
AMCLIB_PMSMBemfObsrvDQ_A32fff	GFLIB_CtrlBetaIPpAWInit_FLT
AMCLIB_PMSMBemfObsrvDQ_F16	GFLIB_CtrlBetaIPpAW_F16
AMCLIB_TrackObsrvInit_A32af	GFLIB_CtrlBetaIPpAW_FLT
AMCLIB_TrackObsrvInit_F16	GFLIB_CtrlPIDpAWInit_F16
AMCLIB_TrackObsrv_A32af	GFLIB_CtrlPIDpAWInit_FLT
AMCLIB_TrackObsrv_F16	GFLIB_CtrlPIDpAW_F16
	GFLIB_CtrlPIDpAW_FLT
GDFLIB_FilterExpInit_F16	GFLIB_CtrlPIpAWInit_F16
GDFLIB_FilterExpInit_FLT	GFLIB_CtrlPIpAWInit_FLT
GDFLIB_FilterExp_F16	GFLIB_CtrlPIpAW_F16
GDFLIB_FilterExp_FLT	GFLIB_CtrlPIpAW_FLT
GDFLIB_FilterIIR1Init_F16	GFLIB_DFlexRampCalcIncr_F16
GDFLIB_FilterIIR1Init_FLT	GFLIB_DFlexRampCalcIncr_FLT
GDFLIB_FilterIIR1_F16	GFLIB_DFlexRampInit_F16
GDFLIB_FilterIIR1_FLT	GFLIB_DFlexRampInit_FLT
GDFLIB_FilterIIR2Init_F16	GFLIB_DFlexRamp_F16
GDFLIB_FilterIIR2Init_FLT	GFLIB_DFlexRamp_FLT
GDFLIB_FilterIIR2_F16	GFLIB_DRampInit_F16
GDFLIB_FilterIIR2_FLT	GFLIB_DRampInit_F32
GDFLIB_FilterIIR3Init_F16	GFLIB_DRampInit_FLT
GDFLIB_FilterIIR3Init_FLT	GFLIB_DRamp_F16
GDFLIB_FilterIIR3_F16	GFLIB_DRamp_F32
GDFLIB_FilterIIR3_FLT	GFLIB_DRamp_FLT
GDFLIB_FilterIIR4Init_F16	GFLIB_FlexRampCalcIncr_F16
GDFLIB_FilterIIR4Init_FLT	GFLIB_FlexRampCalcIncr_FLT
GDFLIB_FilterIIR4_F16	GFLIB_FlexRampInit_F16
GDFLIB_FilterIIR4_FLT	GFLIB_FlexRampInit_FLT
GDFLIB_FilterMAInit_F16	GFLIB_FlexRamp_F16
GDFLIB_FilterMAInit_FLT	GFLIB_FlexRamp_FLT
GDFLIB_FilterMA_F16	GFLIB_FlexSRampCalcIncr_F16

GFLIB_FlexSRampCalcIncr_FLT	GMCLIB_ElimDcBusRip_F16fff
GFLIB_FlexSRampInit_F16	GMCLIB_ElimDcBusRip_F16sas
GFLIB_FlexSRampInit_FLT	GMCLIB_ParkInv_F16
GFLIB_FlexSRamp_F16	GMCLIB_ParkInv_FLT
GFLIB_FlexSRamp_FLT	GMCLIB_Park_F16
GFLIB_Hyst_F16	GMCLIB_Park_FLT
GFLIB_Hyst_FLT	GMCLIB_SvmDpwm_F16
GFLIB_IntegratorInit_F16	GMCLIB_SvmExDpwm_F16
GFLIB_IntegratorInit_FLT	GMCLIB_SvmIct_F16
GFLIB_Integrator_F16	GMCLIB_SvmStd_F16
GFLIB_Integrator_FLT	GMCLIB_SvmU0n_F16
GFLIB_Limit_F16	GMCLIB_SvmU7n_F16
GFLIB_Limit_F32	
GFLIB_Limit_FLT	MLIB_AbsSat_F16
GFLIB_LowerLimit_F16	MLIB_AbsSat_F32
GFLIB_LowerLimit_F32	MLIB_Abs_F16
GFLIB_LowerLimit_FLT	MLIB_Abs_F32
GFLIB_Lut1DInit_FLT	MLIB_Abs_FLT
GFLIB_Lut1D_F16	MLIB_Add4Sat_F16
GFLIB_Lut1D_F32	MLIB_Add4Sat_F32
GFLIB_Lut1D_FLT	MLIB_Add4_F16
GFLIB_LutPer1DInit_FLT	MLIB_Add4_F32
GFLIB_LutPer1D_F16	MLIB_Add4_FLT
GFLIB_LutPer1D_F32	MLIB_AddSat_F16
GFLIB_LutPer1D_FLT	MLIB_AddSat_F32
GFLIB_RampInit_F16	MLIB_Add_A32as
GFLIB_RampInit_F32	MLIB_Add_A32ss
GFLIB_RampInit_FLT	MLIB_Add_F16
GFLIB_Ramp_F16	MLIB_Add_F32
GFLIB_Ramp_F32	MLIB_Add_FLT
GFLIB_Ramp_FLT	MLIB_C1b_U16l
GFLIB_Sin_F16	MLIB_C1b_U16s
GFLIB_Sin_FLT	MLIB_ConvSc_A32ff
GFLIB_Sin_FLTa	MLIB_ConvSc_F16ff
GFLIB_Sqrt_F16	MLIB_ConvSc_F32ff
GFLIB_Sqrt_F16l	MLIB_ConvSc_FLTaf
GFLIB_Sqrt_FLT	MLIB_ConvSc_FLTlf
GFLIB_Tan_F16	MLIB_ConvSc_FLTsf
GFLIB_Tan_FLT	MLIB_Conv_A32f
GFLIB_Tan_FLTa	MLIB_Conv_F16f
GFLIB_UpperLimit_F16	MLIB_Conv_F16l
GFLIB_UpperLimit_F32	MLIB_Conv_F32f
GFLIB_UpperLimit_FLT	MLIB_Conv_F32s
GFLIB_VectorLimit1_F16	MLIB_Conv_FLTa
GFLIB_VectorLimit1_FLT	MLIB_Conv_FLTl
GFLIB_VectorLimit_F16	MLIB_Conv_FLTs
GFLIB_VectorLimit_FLT	MLIB_Div1QSat_A32as
	MLIB_Div1QSat_F16
GMCLIB_ClarkInv_F16	MLIB_Div1QSat_F16ll
GMCLIB_ClarkInv_FLT	MLIB_Div1QSat_F16ls
GMCLIB_Clark_F16	MLIB_Div1QSat_F32
GMCLIB_Clark_FLT	MLIB_Div1QSat_F32ls
GMCLIB_DecouplingPMSM_F16	MLIB_Div1Q_A32as
GMCLIB_DecouplingPMSM_FLT	MLIB_Div1Q_A32ll
GMCLIB_ElimDcBusRipFOC_F16	MLIB_Div1Q_A32ls
GMCLIB_ElimDcBusRipFOC_F16ff	MLIB_Div1Q_A32ss

MLIB_Div1Q_F16
MLIB_Div1Q_F1611
MLIB_Div1Q_F161s
MLIB_Div1Q_F32
MLIB_Div1Q_F321s
MLIB_DivSat_A32as
MLIB_DivSat_F16
MLIB_DivSat_F1611
MLIB_DivSat_F161s
MLIB_DivSat_F32
MLIB_DivSat_F321s
MLIB_Div_A32as
MLIB_Div_A3211
MLIB_Div_A321s
MLIB_Div_A32ss
MLIB_Div_F16
MLIB_Div_F1611
MLIB_Div_F161s
MLIB_Div_F32
MLIB_Div_F321s
MLIB_Div_FLT
MLIB_Log2_U16
MLIB_Mac4RndSat_F16
MLIB_Mac4RndSat_F32
MLIB_Mac4Rnd_F16
MLIB_Mac4Rnd_F32
MLIB_Mac4Sat_F32ssss
MLIB_Mac4_F32ssss
MLIB_Mac4_FLT
MLIB_MacRndSat_F16
MLIB_MacRndSat_F32
MLIB_MacRndSat_F3211s
MLIB_MacRnd_A32ass
MLIB_MacRnd_F16
MLIB_MacRnd_F32
MLIB_MacRnd_F3211s
MLIB_MacSat_F16
MLIB_MacSat_F32
MLIB_MacSat_F321ss
MLIB_Mac_A32ass
MLIB_Mac_F16
MLIB_Mac_F32
MLIB_Mac_F321ss
MLIB_Mac_FLT
MLIB_MnacRndSat_F16
MLIB_MnacRndSat_F32
MLIB_MnacRndSat_F3211s
MLIB_MnacRnd_A32ass
MLIB_MnacRnd_F16
MLIB_MnacRnd_F32
MLIB_MnacRnd_F3211s
MLIB_MnacSat_F16
MLIB_MnacSat_F32
MLIB_MnacSat_F321ss
MLIB_Mnac_A32ass
MLIB_Mnac_F16

MLIB_Mnac_F32
MLIB_Mnac_F321ss
MLIB_Mnac_FLT
MLIB_Msu4RndSat_F16
MLIB_Msu4RndSat_F32
MLIB_Msu4Rnd_F16
MLIB_Msu4Rnd_F32
MLIB_Msu4Sat_F32ssss
MLIB_Msu4_F32ssss
MLIB_Msu4_FLT
MLIB_MsuRndSat_F16
MLIB_MsuRndSat_F32
MLIB_MsuRndSat_F3211s
MLIB_MsuRnd_A32ass
MLIB_MsuRnd_F16
MLIB_MsuRnd_F32
MLIB_MsuRnd_F3211s
MLIB_MsuSat_F16
MLIB_MsuSat_F32
MLIB_MsuSat_F321ss
MLIB_Msu_A32ass
MLIB_Msu_F16
MLIB_Msu_F32
MLIB_Msu_F321ss
MLIB_Msu_FLT
MLIB_MulNegRndSat_A32
MLIB_MulNegRndSat_F16as
MLIB_MulNegRnd_A32
MLIB_MulNegRnd_F16
MLIB_MulNegRnd_F16as
MLIB_MulNegRnd_F32
MLIB_MulNegRnd_F321s
MLIB_MulNegSat_A32
MLIB_MulNegSat_F16as
MLIB_MulNeg_A32
MLIB_MulNeg_F16
MLIB_MulNeg_F16as
MLIB_MulNeg_F32
MLIB_MulNeg_F32ss
MLIB_MulNeg_FLT
MLIB_MulRndSat_A32
MLIB_MulRndSat_F16
MLIB_MulRndSat_F16as
MLIB_MulRndSat_F32
MLIB_MulRndSat_F321s
MLIB_MulRnd_A32
MLIB_MulRnd_F16
MLIB_MulRnd_F16as
MLIB_MulRnd_F32
MLIB_MulRnd_F321s
MLIB_MulSat_A32
MLIB_MulSat_F16
MLIB_MulSat_F16as
MLIB_MulSat_F32
MLIB_MulSat_F32ss
MLIB_Mul_A32

MLIB_Mul_F16
 MLIB_Mul_F16as
 MLIB_Mul_F32
 MLIB_Mul_F32ss
 MLIB_Mul_FLT
 MLIB_NegSat_F16
 MLIB_NegSat_F32
 MLIB_Neg_F16
 MLIB_Neg_F32
 MLIB_Neg_FLT
 MLIB_RcplQ1_A32s
 MLIB_RcplQ_A32s
 MLIB_Rcpl_A32s
 MLIB_Rcp_A32s
 MLIB_RndSat_F16l
 MLIB_Rnd_F16l
 MLIB_Sat_F16a
 MLIB_Sh1LSat_F16
 MLIB_Sh1LSat_F32
 MLIB_Sh1L_F16
 MLIB_Sh1L_F32
 MLIB_Sh1R_F16
 MLIB_Sh1R_F32
 MLIB_ShLBiSat_F16
 MLIB_ShLBiSat_F32
 MLIB_ShLBi_F16
 MLIB_ShLBi_F32
 MLIB_ShLSat_F16
 MLIB_ShLSat_F32
 MLIB_ShL_F16
 MLIB_ShL_F32
 MLIB_ShRBiSat_F16
 MLIB_ShRBiSat_F32
 MLIB_ShRBi_F16
 MLIB_ShRBi_F32
 MLIB_ShR_F16
 MLIB_ShR_F32
 MLIB_Sign_F16

MLIB_Sign_F32
 MLIB_Sign_FLT
 MLIB_Sub4Sat_F16
 MLIB_Sub4Sat_F32
 MLIB_Sub4_F16
 MLIB_Sub4_F32
 MLIB_Sub4_FLT
 MLIB_SubSat_F16
 MLIB_SubSat_F32
 MLIB_Sub_A32as
 MLIB_Sub_A32ss
 MLIB_Sub_F16
 MLIB_Sub_F32
 MLIB_Sub_FLT

PCLIB_Ctrl2P2ZInit_F16
 PCLIB_Ctrl2P2Z_F16
 PCLIB_Ctrl3P3ZInit_F16
 PCLIB_Ctrl3P3Z_F16
 PCLIB_CtrlPIDInit_F16
 PCLIB_CtrlPID_F16
 PCLIB_CtrlPIInit_F16
 PCLIB_CtrlPI_F16
 PCLIB_CtrlPIandLPInit_F16
 PCLIB_CtrlPIandLP_F16

For the CM33 core with the Power Quad peripheral module :

GFLIB_AtanYXPQ_F16
 GFLIB_CosPQ_F16
 GFLIB_SinPQ_F16
 GFLIB_CosPQ_FLT
 GFLIB_SinPQ_FLT
 GFLIB_SqrtPQ_F16l
 GFLIB_SqrtPQ_F16
 GDFLIB_FilterIIR2InitPQ_F16
 GDFLIB_FilterIIR2PQ_F16

The following algorithms are in the release for the CM0+ core (16-bit and 32-bit fixed-point):

AMCLIB_AngleTrackObsrvInit_F16
 AMCLIB_AngleTrackObsrv_F16
 AMCLIB_CtrlFluxWkngInit_F16
 AMCLIB_CtrlFluxWkng_F16
 AMCLIB_PMSMBemfObsrvABInit_F16
 AMCLIB_PMSMBemfObsrvAB_F16
 AMCLIB_PMSMBemfObsrvDQInit_F16
 AMCLIB_PMSMBemfObsrvDQ_F16
 AMCLIB_TrackObsrvInit_F16
 AMCLIB_TrackObsrv_F16

 GDFLIB_FilterExpInit_F16
 GDFLIB_FilterExp_F16

GDFLIB_FilterIIR1Init_F16
 GDFLIB_FilterIIR1_F16
 GDFLIB_FilterIIR2Init_F16
 GDFLIB_FilterIIR2_F16
 GDFLIB_FilterMAInit_F16
 GDFLIB_FilterMA_F16

 GFLIB_AtanYX_F16
 GFLIB_Atan_F16
 GFLIB_Cos_F16
 GFLIB_CtrlBetaIPpAWInit_F16
 GFLIB_CtrlBetaIPpAW_F16
 GFLIB_CtrlPIpAWInit_F16

GFLIB_CtrlPIpAW_F16	MLIB_AddSat_F16
GFLIB_DFflexRampCalcIncr_F16	MLIB_AddSat_F32
GFLIB_DFflexRampInit_F16	MLIB_Add_A32as
GFLIB_DFflexRamp_F16	MLIB_Add_A32ss
GFLIB_DRampInit_F16	MLIB_Add_F16
GFLIB_DRampInit_F32	MLIB_Add_F32
GFLIB_DRamp_F16	MLIB_Clb_U16l
GFLIB_DRamp_F32	MLIB_Clb_U16s
GFLIB_FlexRampCalcIncr_F16	MLIB_Conv_F16l
GFLIB_FlexRampInit_F16	MLIB_Conv_F32s
GFLIB_FlexRamp_F16	MLIB_Div1QSat_A32as
GFLIB_Hyst_F16	MLIB_Div1QSat_F16
GFLIB_IntegratorInit_F16	MLIB_Div1QSat_F16ll
GFLIB_Integrator_F16	MLIB_Div1QSat_F16ls
GFLIB_Limit_F16	MLIB_Div1QSat_F32
GFLIB_Limit_F32	MLIB_Div1QSat_F32ls
GFLIB_LowerLimit_F16	MLIB_Div1Q_A32as
GFLIB_LowerLimit_F32	MLIB_Div1Q_A32ll
GFLIB_Lut1D_F16	MLIB_Div1Q_A32ls
GFLIB_Lut1D_F32	MLIB_Div1Q_A32ss
GFLIB_LutPer1D_F16	MLIB_Div1Q_F16
GFLIB_LutPer1D_F32	MLIB_Div1Q_F16ll
GFLIB_RampInit_F16	MLIB_Div1Q_F16ls
GFLIB_RampInit_F32	MLIB_Div1Q_F32
GFLIB_Ramp_F16	MLIB_Div1Q_F32ls
GFLIB_Ramp_F32	
GFLIB_Sin_F16	MLIB_DivSat_A32as
GFLIB_F16l	MLIB_DivSat_F16
GFLIB_Sqrt_F16	MLIB_DivSat_F16ll
GFLIB_Sqrt_F16l	MLIB_DivSat_F16ls
GFLIB_UpperLimit_F16	MLIB_DivSat_F32
GFLIB_UpperLimit_F32	MLIB_DivSat_F32ls
GFLIB_VectorLimit1_F16	MLIB_Div_A32as
	MLIB_Div_A32ll
GMCLIB_ClarkInv_F16	MLIB_Div_A32ls
GMCLIB_Clark_F16	MLIB_Div_A32ss
GMCLIB_DecouplingPMSM_F16	MLIB_Div_F16
GMCLIB_ElimDcBusRipFOC_F16	MLIB_Div_F16ll
GMCLIB_ElimDcBusRip_F16sas	MLIB_Div_F16ls
GMCLIB_ParkInv_F16	MLIB_Div_F32
GMCLIB_Park_F16	MLIB_Div_F32ls
GMCLIB_SvmDpwm_F16	MLIB_Log2_U16
GMCLIB_SvmExDpwm_F16	MLIB_Mac4RndSat_F16
GMCLIB_SvmIct_F16	MLIB_Mac4RndSat_F32
GMCLIB_SvmStd_F16	MLIB_Mac4Rnd_F16
GMCLIB_SvmU0n_F16	MLIB_Mac4Rnd_F32
GMCLIB_SvmU7n_F16	MLIB_Mac4Sat_F32ssss
	MLIB_Mac4_F32ssss
MLIB_AbsSat_F16	MLIB_MacRndSat_F16
MLIB_AbsSat_F32	MLIB_MacRndSat_F32
MLIB_Abs_F16	MLIB_MacRndSat_F32lls
MLIB_Abs_F32	MLIB_MacRnd_A32ass
MLIB_Add4Sat_F16	MLIB_MacRnd_F16
MLIB_Add4Sat_F32	MLIB_MacRnd_F32
MLIB_Add4_F16	MLIB_MacRnd_F32lls
MLIB_Add4_F32	MLIB_MacSat_F16

MLIB_MacSat_F32	MLIB_MulRndSat_F16as
MLIB_MacSat_F32lss	MLIB_MulRndSat_F32
MLIB_Mac_A32ass	MLIB_MulRndSat_F32ls
MLIB_Mac_F16	MLIB_MulRnd_A32
MLIB_Mac_F32	MLIB_MulRnd_F16
MLIB_Mac_F32lss	MLIB_MulRnd_F16as
MLIB_MnacRndSat_F16	MLIB_MulRnd_F32
MLIB_MnacRndSat_F32	MLIB_MulRnd_F32ls
MLIB_MnacRndSat_F32lls	MLIB_MulSat_A32
MLIB_MnacRnd_A32ass	MLIB_MulSat_F16
MLIB_MnacRnd_F16	MLIB_MulSat_F16as
MLIB_MnacRnd_F32	MLIB_MulSat_F32
MLIB_MnacRnd_F32lls	MLIB_MulSat_F32ss
MLIB_MnacSat_F16	MLIB_Mul_A32
MLIB_MnacSat_F32	MLIB_Mul_F16
MLIB_MnacSat_F32lss	MLIB_Mul_F16as
MLIB_Mnac_A32ass	MLIB_Mul_F32
MLIB_Mnac_F16	MLIB_Mul_F32ss
MLIB_Mnac_F32	MLIB_NegSat_F16
MLIB_Mnac_F32lss	MLIB_NegSat_F32
MLIB_Msu4RndSat_F16	MLIB_Neg_F16
MLIB_Msu4RndSat_F32	MLIB_Neg_F32
MLIB_Msu4Rnd_F16	MLIB_Rcp1Q1_A32s
MLIB_Msu4Rnd_F32	MLIB_Rcp1Q_A32s
MLIB_Msu4Sat_F32ssss	MLIB_Rcp1_A32s
MLIB_Msu4_F32ssss	MLIB_RcpHw1Q1_A32s
MLIB_MsuRndSat_F16	MLIB_RcpHw1Q_A32s
MLIB_MsuRndSat_F32	MLIB_RcpHw1_A32s
MLIB_MsuRndSat_F32lls	MLIB_RcpHw_A32s
MLIB_MsuRnd_A32ass	MLIB_Rcp_A32s
MLIB_MsuRnd_F16	MLIB_RndSat_F16l
MLIB_MsuRnd_F32	MLIB_Rnd_F16l
MLIB_MsuRnd_F32lls	MLIB_Sat_F16a
MLIB_MsuSat_F16	MLIB_Sh1LSat_F16
MLIB_MsuSat_F32	MLIB_Sh1LSat_F32
MLIB_MsuSat_F32lss	MLIB_Sh1L_F16
MLIB_Msu_A32ass	MLIB_Sh1L_F32
MLIB_Msu_F16	MLIB_Sh1R_F16
MLIB_Msu_F32	MLIB_Sh1R_F32
MLIB_Msu_F32lss	MLIB_ShLBiSat_F16
MLIB_MulNegRndSat_A32	MLIB_ShLBiSat_F32
MLIB_MulNegRndSat_F16as	MLIB_ShLBi_F16
MLIB_MulNegRnd_A32	MLIB_ShLBi_F32
MLIB_MulNegRnd_F16	MLIB_ShLSat_F16
MLIB_MulNegRnd_F16as	MLIB_ShLSat_F32
MLIB_MulNegRnd_F32	MLIB_ShL_F16
MLIB_MulNegRnd_F32ls	MLIB_ShL_F32
MLIB_MulNegSat_A32	MLIB_ShRBiSat_F16
MLIB_MulNegSat_F16as	MLIB_ShRBiSat_F32
MLIB_MulNeg_A32	MLIB_ShRBi_F16
MLIB_MulNeg_F16	MLIB_ShRBi_F32
MLIB_MulNeg_F16as	MLIB_ShR_F16
MLIB_MulNeg_F32	MLIB_ShR_F32
MLIB_MulNeg_F32ss	MLIB_Sign_F16
MLIB_MulRndSat_A32	MLIB_Sign_F32
MLIB_MulRndSat_F16	MLIB_Sub4Sat_F16

MLIB_Sub4Sat_F32
MLIB_Sub4_F16
MLIB_Sub4_F32
MLIB_SubSat_F16
MLIB_SubSat_F32
MLIB_Sub_A32as
MLIB_Sub_A32ss
MLIB_Sub_F16
MLIB_Sub_F32

PCLIB_Ctrl2P2ZInit_F16
PCLIB_Ctrl2P2Z_F16
PCLIB_Ctrl3P3ZInit_F16
PCLIB_Ctrl3P3Z_F16
PCLIB_CtrlPIDInit_F16
PCLIB_CtrlPID_F16
PCLIB_CtrlPIInit_F16
PCLIB_CtrlPI_F16
PCLIB_CtrlPIandLPInit_F16
PCLIB_CtrlPIandLP_F16

AMCLIB_PMSMBemfObsrvABHw_F16
AMCLIB_PMSMBemfObsrvDQHw_F16
GFLIB_AtanYXHw_F16
GFLIB_DFlexRampCalcIncrHw_F16
GFLIB_FlexRampCalcIncrHw_F16
GFLIB_SqrtHw_F16
GFLIB_VectorLimit1Hw_F16
GMCLIB_ElimDcBusRipFOCHw_F16
GMCLIB_ElimDcBusRipHw_F16sas
MLIB_DivHw1QSat_F16
MLIB_DivHw1QSat_F1611
MLIB_DivHw1QSat_F161s
MLIB_DivHw1QSat_F32
MLIB_DivHw1QSat_F321s
MLIB_DivHw1QSat_F321s
MLIB_DivHw1Q_A3211
MLIB_DivHw1Q_A321s
MLIB_DivHw1Q_A32ss
MLIB_DivHw1Q_F16
MLIB_DivHw1Q_F1611
MLIB_DivHw1Q_F161s
MLIB_DivHw1Q_F32
MLIB_DivHw1Q_F321s
MLIB_DivHw1Q_F321s
MLIB_DivHwSat_F16
MLIB_DivHwSat_F1611

**The following algorithms are in the release for
the CM0+ core with the MMDVSQ
peripheral module:**

MLIB_DivHwSat_F161s
MLIB_DivHwSat_F32
MLIB_DivHwSat_F321s
MLIB_DivHwSat_F321s
MLIB_DivHw_A3211
MLIB_DivHw_A321s
MLIB_DivHw_A32ss
MLIB_DivHw_F16
MLIB_DivHw_F1611
MLIB_DivHw_F161s
MLIB_DivHw_F32
MLIB_DivHw_F321s
MLIB_DivHw_F321s

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