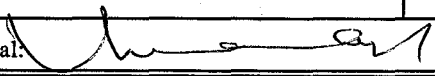


# SOFTWARE RELEASE NOTICE

01. SRN Number: RDCO-SRN-110		
02. Project Title: KENO5A-Monte Carlo Criticality Program with Supergrouping		Project No. 20-5702-621
03. SRN Title: KENO5A		
04. Originator/Requestor: Budhi Sagar		Date: 01/22/96
05. Summary of Actions <ul style="list-style-type: none"> <li><input type="checkbox"/> Release of new software</li> <li><input type="checkbox"/> Release of modified software:             <ul style="list-style-type: none"> <li><input type="checkbox"/> Enhancements made</li> <li><input type="checkbox"/> Corrections made</li> </ul> </li> <li><input type="checkbox"/> Change of access software</li> <li><input checked="" type="checkbox"/> Software Retirement</li> </ul>		
06. Persons Authorized Access		
Name	RO/RW	A/C/D
N/A		
07. Element Manager Approval: 		Date: 1/30/96
08. Remarks:  Not considered important to regulatory reviews in revised FY96 OPS Plans.		

# SOFTWARE SUMMARY FORM

01. Summary Date: 06/27/94		02. Summary prepared by (Name and Phone) T.J. Ratchford 522-3083		03. Summary Action:  New	
04. Software Date: 8/27/94		05. Short Title: KENO5A			
06. Software Title: KENO5A - Monte Carlo Criticality Program with Supergrouping.				07. Internal Software ID:  NONE	
08. Software Type:  <input type="checkbox"/> Automated Data System  <input checked="" type="checkbox"/> Computer Program  <input type="checkbox"/> Subroutine/Module		09. Processing Mode:  <input type="checkbox"/> Interactive  <input type="checkbox"/> Batch  <input checked="" type="checkbox"/> Combination		10. APPLICATION AREA A. General: <input type="checkbox"/> Scientific/Engineering <input type="checkbox"/> Auxiliary Analyses <input type="checkbox"/> Total System PA <input type="checkbox"/> Subsystem PA <input checked="" type="checkbox"/> Other  b. Specific:	
11. Submitting Organization and Address:  CNWRA, SwRI, San Antonio, Texas			12. Technical Contact(s) and Phone:  H. Karimi, (210) 522-5253		
13. Narrative:  KENO5A - A program to solve the three-dimensional Boltzmann transport equation for neutron multiplying system. The primary purpose of KENO5A is to determine k-effective.					
14. Computer Platform  CRAY/XMP		15. Computer Operating System:  UNIX		16. Programming Language(s):  FORTRAN	
17. Number of Source Program Statements: 154,730 lines of code		18. Computer Memory Requirements: UNKNOWN		19. Tape Drives: NONE	
20. Disk/Drum Units: N/A		21. Graphics: UNKNOWN			
22. Other Operational Requirements  NONE					
23. Software Availability: <input checked="" type="checkbox"/> Available <input type="checkbox"/> Limited <input type="checkbox"/> In-House ONLY			24. Documentation Availability: <input checked="" type="checkbox"/> Available <input type="checkbox"/> Inadequate <input type="checkbox"/> In-House ONLY		
25. Submission Package Status:  Acceptance Criteria: Met <input checked="" type="checkbox"/> Not Met <input type="checkbox"/> Software QA Assessment: Successful <input checked="" type="checkbox"/> Unsuccessful <input type="checkbox"/>  Code Custodian: <u>T.J. Ratchford</u> Date: <u>6/27/94</u>					

## Cray KENO5A Directory Listing

-r--r-----	1	tjrl1	tjrl1	94978	Jun	24	14:08	KENO5A.OUT
-r--r-----	1	tjrl1	tjrl1	898977	Jun	24	14:08	KENO5CDS.LIB
-r--r-----	1	tjrl1	tjrl1	3554	Jun	24	14:08	Makefile
-r--r-----	1	tjrl1	tjrl1	1232	Jun	24	14:11	adjust.F
-r--r-----	1	tjrl1	tjrl1	4174	Jun	24	14:11	albedo.F
-r--r-----	1	tjrl1	tjrl1	3304	Jun	24	14:11	albrd.F
-r--r-----	1	tjrl1	tjrl1	2013	Jun	24	14:11	albuse.F
-r--r-----	1	tjrl1	tjrl1	137	Jun	24	14:11	alocat.F
-r--r-----	1	tjrl1	tjrl1	2648	Jun	24	14:11	angles.F
-r--r-----	1	tjrl1	tjrl1	524	Jun	24	14:11	aralba.F
-r--r-----	1	tjrl1	tjrl1	10275	Jun	24	14:11	arasiz.F
-r--r-----	1	tjrl1	tjrl1	6658	Jun	24	14:11	arrayin.F
-r--r-----	1	tjrl1	tjrl1	2861	Jun	24	14:11	aread.F
-r--r-----	1	tjrl1	tjrl1	5711	Jun	24	14:11	awlpdk.f
-r--r-----	1	tjrl1	tjrl1	166	Jun	24	14:11	azirn.F
-r--r-----	1	tjrl1	tjrl1	2090	Jun	24	14:11	badmom.F
-r--r-----	1	tjrl1	tjrl1	1106	Jun	24	14:11	banker.F
-r--r-----	1	tjrl1	tjrl1	717	Jun	24	14:11	bd.F
-r--r-----	1	tjrl1	tjrl1	1224	Jun	24	14:11	box.F
-r--r-----	1	tjrl1	tjrl1	1069	Jun	24	14:11	boxc.F
-r--r-----	1	tjrl1	tjrl1	3261	Jun	24	14:11	chkstr.F
-r--r-----	1	tjrl1	tjrl1	909	Jun	24	14:11	choose.F
-r--r-----	1	tjrl1	tjrl1	159	Jun	24	14:11	clear.F
-r--r-----	1	tjrl1	tjrl1	285	Jun	24	14:11	clscr.F
-r--r-----	1	tjrl1	tjrl1	1241	Jun	24	14:11	cmprs.F
-r--r-----	1	tjrl1	tjrl1	4008	Jun	24	14:11	corre.F
-r--r-----	1	tjrl1	tjrl1	4782	Jun	24	14:11	corsiz.F
-r--r-----	1	tjrl1	tjrl1	255	Jun	24	14:11	cread.F
-r--r-----	1	tjrl1	tjrl1	108108	Jun	24	14:11	crit132.out
-r--r-----	1	tjrl1	tjrl1	3313	Jun	24	14:11	crmax.F
-r--r-----	1	tjrl1	tjrl1	5781	Jun	24	14:11	crmin.F
-r--r-----	1	tjrl1	tjrl1	14450	Jun	24	14:11	cros.F
-r--r-----	1	tjrl1	tjrl1	193	Jun	24	14:11	crsprd.F
-r--r-----	1	tjrl1	tjrl1	14812	Jun	24	14:11	datain.F
-r--r-----	1	tjrl1	tjrl1	214	Jun	24	14:11	datim.F
-r--r-----	1	tjrl1	tjrl1	755	Jun	24	14:11	difalb.F
-r--r-----	1	tjrl1	tjrl1	172	Jun	24	14:11	dotprd.F
-r--r-----	1	tjrl1	tjrl1	4727	Jun	24	14:11	dread.F
-r--r-----	1	tjrl1	tjrl1	173	Jun	24	14:11	dtaset.F
-r--r-----	1	tjrl1	tjrl1	5378	Jun	24	14:11	editor.F
-r--r-----	1	tjrl1	tjrl1	230	Jun	24	14:11	enfile.F
-r--r-----	1	tjrl1	tjrl1	47	Jun	24	14:11	errtra.F
-r--r-----	1	tjrl1	tjrl1	75	Jun	24	14:11	exprn.F
-r--r-----	1	tjrl1	tjrl1	87	Jun	24	14:11	extra.F
-r--r-----	1	tjrl1	tjrl1	47	Jun	24	14:11	eyenit.F
-r--r-----	1	tjrl1	tjrl1	699	Jun	24	14:11	fhlpr.F
-r--r-----	1	tjrl1	tjrl1	85	Jun	24	14:11	fidcom.F
-r--r-----	1	tjrl1	tjrl1	4054	Jun	24	14:11	fil2d.F
-r--r-----	1	tjrl1	tjrl1	8548	Jun	24	14:11	fillsg.F
-r--r-----	1	tjrl1	tjrl1	1454	Jun	24	14:11	find.F
-r--r-----	1	tjrl1	tjrl1	2859	Jun	24	14:11	findbx.F
-r--r-----	1	tjrl1	tjrl1	204	Jun	24	14:11	findqa.F
-r--r-----	1	tjrl1	tjrl1	6700	Jun	24	14:11	fisflx.F
-r--r-----	1	tjrl1	tjrl1	5304	Jun	24	14:11	fitflx.F
-r--r-----	1	tjrl1	tjrl1	7972	Jun	24	14:11	fldata.F
-r--r-----	1	tjrl1	tjrl1	87	Jun	24	14:12	fltln.F
-r--r-----	1	tjrl1	tjrl1	88	Jun	24	14:12	fltout.F
-r--r-----	1	tjrl1	tjrl1	1737	Jun	24	14:12	fltrn.F
-r--r-----	1	tjrl1	tjrl1	109	Jun	24	14:12	fread.F
-r--r-----	1	tjrl1	tjrl1	3522	Jun	24	14:12	freak.F
-r--r-----	1	tjrl1	tjrl1	50	Jun	24	14:12	freecr.F
-r--r-----	1	tjrl1	tjrl1	2198	Jun	24	14:12	geomin.F
-r--r-----	1	tjrl1	tjrl1	2777	Jun	24	14:12	getmus.F

-r--r-----	1	tjr1	tjr1	995	Jun	24	14:12	gocurs.F
-r--r-----	1	tjr1	tjr1	182	Jun	24	14:12	gtiso.F
-r--r-----	1	tjr1	tjr1	475	Jun	24	14:12	gtvols.F
-r--r-----	1	tjr1	tjr1	15566	Jun	24	14:12	guide.F
-r--r-----	1	tjr1	tjr1	154	Jun	24	14:12	hlfrwd.F
-r--r-----	1	tjr1	tjr1	2712	Jun	24	14:12	holchk.F
-r--r-----	1	tjr1	tjr1	1853	Jun	24	14:12	hole.F
-r--r-----	1	tjr1	tjr1	3191	Jun	24	14:12	holext.F
-r--r-----	1	tjr1	tjr1	5605	Jun	24	14:12	holhol.F
-r--r-----	1	tjr1	tjr1	1330	Jun	24	14:12	hunter.F
-r--r-----	1	tjr1	tjr1	5408	Jun	24	14:12	icemix.F
-r--r-----	1	tjr1	tjr1	249	Jun	24	14:12	icompa.F
-r--r-----	1	tjr1	tjr1	1771	Jun	24	14:12	idx1d.F
-r--r-----	1	tjr1	tjr1	631	Jun	24	14:12	indx.F
-r--r-----	1	tjr1	tjr1	5007	Jun	24	14:12	inital.F
-r--r-----	1	tjr1	tjr1	332	Jun	24	14:12	io.F
-r--r-----	1	tjr1	tjr1	76	Jun	24	14:12	ioleft.F
-r--r-----	1	tjr1	tjr1	383	Jun	24	14:12	iosdun.F
-r--r-----	1	tjr1	tjr1	448	Jun	24	14:12	iowrt.F
-r--r-----	1	tjr1	tjr1	109	Jun	24	14:12	iread.F
-r--r-----	1	tjr1	tjr1	322	Jun	24	14:12	ixalb.F
-r--r-----	1	tjr1	tjr1	94875	Jun	24	14:12	jezebel.out
-r--r-----	1	tjr1	tjr1	378	Jun	24	14:12	jll2.F
-r--r-----	1	tjr1	tjr1	102	Jun	24	14:12	jobnum.F
-r--r-----	1	tjr1	tjr1	8301	Jun	24	14:12	jomchk.F
-r--r-----	1	tjr1	tjr1	4710	Jun	24	14:12	jomity.F
-r--r-----	1	tjr1	tjr1	305	Jun	24	14:12	jstime.F
-r--r-----	1	tjr1	tjr1	158	Jun	24	14:12	jszero.F
-r--r-----	1	tjr1	tjr1	11081	Jun	24	14:12	kedit.F
-r--r-----	1	tjr1	tjr1	694236	Jun	24	14:12	keno5a.SRC
-r--r-----	1	tjr1	tjr1	694236	Jun	24	14:12	keno5a.src
-r--r-----	1	tjr1	tjr1	13509	Jun	24	14:12	kenog.F
-r--r-----	1	tjr1	tjr1	2326	Jun	24	14:12	kenova.F
-r--r-----	1	tjr1	tjr1	1113	Jun	24	14:12	labl.F
-r--r-----	1	tjr1	tjr1	1533	Jun	24	14:12	ldwrt.F
-r--r-----	1	tjr1	tjr1	1142	Jun	24	14:12	legend.F
-r--r-----	1	tjr1	tjr1	4457	Jun	24	14:12	limln.F
-r--r-----	1	tjr1	tjr1	1082	Jun	24	14:12	listqa.F
-r--r-----	1	tjr1	tjr1	2637	Jun	24	14:12	loadit.F
-r--r-----	1	tjr1	tjr1	4821	Jun	24	14:12	locate.F
-r--r-----	1	tjr1	tjr1	896	Jun	24	14:12	locbox.F
-r--r-----	1	tjr1	tjr1	685	Jun	24	14:12	lodalb.F
-r--r-----	1	tjr1	tjr1	4373	Jun	24	14:12	lodara.F
-r--r-----	1	tjr1	tjr1	183	Jun	24	14:12	lodrgc.F
-r--r-----	1	tjr1	tjr1	3672	Jun	24	14:12	lodwts.F
-r--r-----	1	tjr1	tjr1	2889	Jun	24	14:12	looper.F
-r--r-----	1	tjr1	tjr1	769	Jun	24	14:12	lread.F
-r--r-----	1	tjr1	tjr1	430	Jun	24	14:12	lscan.F
-r--r-----	1	tjr1	tjr1	27289	Jun	24	14:12	lttr.F
-r--r-----	1	tjr1	tjr1	1884	Jun	24	14:12	makang.F
-r--r-----	1	tjr1	tjr1	2316	Jun	24	14:12	maktap.F
-r--r-----	1	tjr1	tjr1	3168	Jun	24	14:12	malpdk.f
-r--r-----	1	tjr1	tjr1	10683	Jun	24	14:12	master.F
-r--r-----	1	tjr1	tjr1	2202	Jun	24	14:12	matk.F
-r--r-----	1	tjr1	tjr1	13134	Jun	24	14:12	matrix.F
-r--r-----	1	tjr1	tjr1	420	Jun	24	14:12	message.F
-r--r-----	1	tjr1	tjr1	4584	Jun	24	14:12	mesh.F
-r--r-----	1	tjr1	tjr1	270	Jun	24	14:12	mgcwrd.F
-r--r-----	1	tjr1	tjr1	1665	Jun	24	14:12	mix1d.F
-r--r-----	1	tjr1	tjr1	930	Jun	24	14:12	mix2d.F
-r--r-----	1	tjr1	tjr1	181	Jun	24	14:12	mix2m.F
-r--r-----	1	tjr1	tjr1	445	Jun	24	14:12	mixcrs.F
-r--r-----	1	tjr1	tjr1	4804	Jun	24	14:12	mixer.F
-r--r-----	1	tjr1	tjr1	2695	Jun	24	14:12	mixit.F
-r--r-----	1	tjr1	tjr1	5659	Jun	24	14:12	mixmix.F

-r--r-----	1	tjr1	tjr1	138	Jun	24	14:12	move.F
-r--r-----	1	tjr1	tjr1	541	Jun	24	14:12	nnit1.F
-r--r-----	1	tjr1	tjr1	1159	Jun	24	14:12	norm1d.F
-r--r-----	1	tjr1	tjr1	494	Jun	24	14:13	norm2d.F
-r--r-----	1	tjr1	tjr1	2388	Jun	24	14:13	nstart.F
-r--r-----	1	tjr1	tjr1	15448	Jun	24	14:13	nsupg.F
-r--r-----	1	tjr1	tjr1	2307	Jun	24	14:13	openda.F
-r--r-----	1	tjr1	tjr1	168	Jun	24	14:13	opnfil.F
-r--r-----	1	tjr1	tjr1	21508	Jun	24	14:13	param.F
-r--r-----	1	tjr1	tjr1	3853	Jun	24	14:13	pltkef.F
-r--r-----	1	tjr1	tjr1	7078	Jun	24	14:13	point.F
-r--r-----	1	tjr1	tjr1	5204	Jun	24	14:13	posit.F
-r--r-----	1	tjr1	tjr1	2239	Jun	24	14:13	prang.F
-r--r-----	1	tjr1	tjr1	3576	Jun	24	14:13	print.F
-r--r-----	1	tjr1	tjr1	1129	Jun	24	14:13	prt1d.F
-r--r-----	1	tjr1	tjr1	537	Jun	24	14:13	prt1ds.F
-r--r-----	1	tjr1	tjr1	2604	Jun	24	14:13	prt2ds.F
-r--r-----	1	tjr1	tjr1	1237	Jun	24	14:13	prtara.F
-r--r-----	1	tjr1	tjr1	766	Jun	24	14:13	prtflx.F
-r--r-----	1	tjr1	tjr1	9295	Jun	24	14:13	prtjom.F
-r--r-----	1	tjr1	tjr1	3883	Jun	24	14:13	prtlba.F
-r--r-----	1	tjr1	tjr1	522	Jun	24	14:13	prtmix.F
-r--r-----	1	tjr1	tjr1	5924	Jun	24	14:13	prtplt.F
-r--r-----	1	tjr1	tjr1	2400	Jun	24	14:13	prtwts.F
-r--r-----	1	tjr1	tjr1	4482	Jun	24	14:13	prtxs.F
-r--r-----	1	tjr1	tjr1	45	Jun	24	14:13	pull.F
-r--r-----	1	tjr1	tjr1	91	Jun	24	14:13	punt.F
-r--r-----	1	tjr1	tjr1	705	Jun	24	14:13	q.F
-r--r-----	1	tjr1	tjr1	978	Jun	24	14:13	qrdbfr.F
-r--r-----	1	tjr1	tjr1	2639	Jun	24	14:13	ratio.F
-r--r-----	1	tjr1	tjr1	878	Jun	24	14:13	rchrs.F
-r--r-----	1	tjr1	tjr1	1853	Jun	24	14:13	rdalb.F
-r--r-----	1	tjr1	tjr1	1027	Jun	24	14:13	rdara.F
-r--r-----	1	tjr1	tjr1	5619	Jun	24	14:13	rdbias.F
-r--r-----	1	tjr1	tjr1	5857	Jun	24	14:13	rdbox.F
-r--r-----	1	tjr1	tjr1	9651	Jun	24	14:13	rdcalc.F
-r--r-----	1	tjr1	tjr1	2663	Jun	24	14:13	rdgrp.F
-r--r-----	1	tjr1	tjr1	2231	Jun	24	14:13	rdice.F
-r--r-----	1	tjr1	tjr1	221	Jun	24	14:13	rdmixt.F
-r--r-----	1	tjr1	tjr1	708	Jun	24	14:13	rdorgn.F
-r--r-----	1	tjr1	tjr1	8263	Jun	24	14:13	rdplot.F
-r--r-----	1	tjr1	tjr1	5025	Jun	24	14:13	rdref.F
-r--r-----	1	tjr1	tjr1	7742	Jun	24	14:13	rdrst.F
-r--r-----	1	tjr1	tjr1	4088	Jun	24	14:13	rdstrt.F
-r--r-----	1	tjr1	tjr1	8749	Jun	24	14:13	rdtape.F
-r--r-----	1	tjr1	tjr1	1137	Jun	24	14:13	rdwts.F
-r--r-----	1	tjr1	tjr1	5236	Jun	24	14:13	readgm.F
-r--r-----	1	tjr1	tjr1	1294	Jun	24	14:13	relate.F
-r--r-----	1	tjr1	tjr1	4286	Jun	24	14:13	reset.F
-r--r-----	1	tjr1	tjr1	1972	Jun	24	14:13	rgused.F
-r--r-----	1	tjr1	tjr1	263	Jun	24	14:13	rndin.F
-r--r-----	1	tjr1	tjr1	239	Jun	24	14:13	rndout.F
-r--r-----	1	tjr1	tjr1	75	Jun	24	14:13	rnsd.F
-r--r-----	1	tjr1	tjr1	579	Jun	24	14:13	rt.F
-r--r-----	1	tjr1	tjr1	370	Jun	24	14:13	rtadj.F
-r--r-----	1	tjr1	tjr1	3266	Jun	24	14:13	rtara.F
-r--r-----	1	tjr1	tjr1	1238	Jun	24	14:13	savst6.F
-r--r-----	1	tjr1	tjr1	1235	Jun	24	14:13	scanon.F
-r--r-----	1	tjr1	tjr1	417	Jun	24	14:13	scoot.F
-r--r-----	1	tjr1	tjr1	77	Jun	24	14:13	sflra.F
-r--r-----	1	tjr1	tjr1	1164	Jun	24	14:13	sgalb.F
-r--r-----	1	tjr1	tjr1	527	Jun	24	14:13	sgwt.F
-r--r-----	1	tjr1	tjr1	9011	Jun	24	14:13	sorta.F
-r--r-----	1	tjr1	tjr1	1164	Jun	24	14:13	sortbk.F
-r--r-----	1	tjr1	tjr1	2702	Jun	24	14:13	sortr.F

-r--r-----	1	tjrl	tjrl	2632	Jun	24	14:13	srmax.F
-r--r-----	1	tjrl	tjrl	4101	Jun	24	14:13	srmin.F
-r--r-----	1	tjrl	tjrl	15029	Jun	24	14:13	start.F
-r--r-----	1	tjrl	tjrl	888	Jun	24	14:13	start0.F
-r--r-----	1	tjrl	tjrl	1041	Jun	24	14:13	start1.F
-r--r-----	1	tjrl	tjrl	1802	Jun	24	14:13	start2.F
-r--r-----	1	tjrl	tjrl	891	Jun	24	14:13	start3.F
-r--r-----	1	tjrl	tjrl	977	Jun	24	14:13	start4.F
-r--r-----	1	tjrl	tjrl	1221	Jun	24	14:13	start5.F
-r--r-----	1	tjrl	tjrl	3023	Jun	24	14:13	start6.F
-r--r-----	1	tjrl	tjrl	4037	Jun	24	14:13	statis.F
-r--r-----	1	tjrl	tjrl	108	Jun	24	14:13	stop.F
-r--r-----	1	tjrl	tjrl	4015	Jun	24	14:13	strtsu.F
-r--r-----	1	tjrl	tjrl	527	Jun	24	14:13	sumsct.F
-r--r-----	1	tjrl	tjrl	457	Jun	24	14:13	timer.F
-r--r-----	1	tjrl	tjrl	66	Jun	24	14:13	timfac.F
-r--r-----	1	tjrl	tjrl	26657	Jun	24	14:13	track.F
-r--r-----	1	tjrl	tjrl	1497	Jun	24	14:13	trkwrt.F
-r--r-----	1	tjrl	tjrl	278	Jun	24	14:13	uncrs.F
-r--r-----	1	tjrl	tjrl	153	Jun	24	14:13	vecadd.F
-r--r-----	1	tjrl	tjrl	153	Jun	24	14:13	vecdif.F
-r--r-----	1	tjrl	tjrl	136	Jun	24	14:13	vecnrm.F
-r--r-----	1	tjrl	tjrl	3643	Jun	24	14:13	volfis.F
-r--r-----	1	tjrl	tjrl	9472	Jun	24	14:13	volume.F
-r--r-----	1	tjrl	tjrl	3145	Jun	24	14:13	waitin.F
-r--r-----	1	tjrl	tjrl	4898	Jun	24	14:13	wates.F
-r--r-----	1	tjrl	tjrl	3193	Jun	24	14:13	wgtpdk.f
-r--r-----	1	tjrl	tjrl	1481	Jun	24	14:13	wrtalb.F
-r--r-----	1	tjrl	tjrl	848	Jun	24	14:13	wrtara.F
-r--r-----	1	tjrl	tjrl	4773	Jun	24	14:13	wrtcal.F
-r--r-----	1	tjrl	tjrl	2430	Jun	24	14:13	wrtgrp.F
-r--r-----	1	tjrl	tjrl	1868	Jun	24	14:13	wrtice.F
-r--r-----	1	tjrl	tjrl	451	Jun	24	14:13	wrtplt.F
-r--r-----	1	tjrl	tjrl	7429	Jun	24	14:13	wtrrst.F
-r--r-----	1	tjrl	tjrl	1047	Jun	24	14:13	wrtwts.F
-r--r-----	1	tjrl	tjrl	346	Jun	24	14:13	x.keno5a.covr
-r--r-----	1	tjrl	tjrl	434	Jun	24	14:13	x.keno5a.test
-r--r-----	1	tjrl	tjrl	623	Jun	24	14:13	xlngths.F
-r--r-----	1	tjrl	tjrl	4401	Jun	24	14:13	xrmin.F
-r--r-----	1	tjrl	tjrl	2358	Jun	24	14:13	xsecld.F
-r--r-----	1	tjrl	tjrl	527	Jun	24	14:13	xxin.F
-r--r-----	1	tjrl	tjrl	1574	Jun	24	14:13	xxlim.F
-r--r-----	1	tjrl	tjrl	7255	Jun	24	14:13	xxmin.F
-r--r-----	1	tjrl	tjrl	1063	Jun	24	14:13	y0read.F
-r--r-----	1	tjrl	tjrl	6929	Jun	24	14:13	yread.F
-r--r-----	1	tjrl	tjrl	2656	Jun	24	14:13	zread.F

6/27/94 9/12

# KENO5A Fortran Program Static and Dynamic Analysis

June 7, 1994

**DRAFT**

Earl S. Marwil  
John E. Tolli  
Scientific Computing Unit  
Idaho National Engineering Laboratory

## 1. Introduction

This analysis was performed on the Cray version of the software as provided by Southwest Research Institute (SwRI).

One sample problem was used along with the source code. The program was analyzed using the Craft (Cross Reference Analysis of Fortran) tool, FORWARN, the Fortran 77 analyzer, and PC-Metric. These tools provide static analysis, coverage analysis, and complexity analysis.

The auxilliary programs AWLPDK, MALPDK, and WGTPDK were converted to the Cray and used to generate the binary data libraries for the test problem run, but have not undergone Fortran analysis.

## 2. References

- [1] N.H. Marshall and E.S. Marwil, Cross Reference Analysis of Fortran (CRAFT), EG&G-CATT-9198, EG&G Idaho, Inc., July 1991.
- [2] Fortran 77 Analyzer User's Manual, National Bureau of Standards, NBS GCR 81-359, 1981
- [3] FORWARN User's Guide, Quibus Enterprises, Inc., July 1991.
- [4] PC-Metric User's Guide, SET Laboratories, Inc., 1987.

## 3. Functions

The KENO5A program contains 227 Fortran routines. There are 6 block data routines.

There are 16 alternate entry points as follows:

Alternate entry	Module	Alternate entry	Module	Alternate entry	Module
allowc	scanon	rd	openda	rstptr	scanon
closda	openda	reed	openda	scanof	scanon
getptr	scanon	resetb	scanon	setbin	scanon
inquir	openda	resetc	scanon	xtenda	openda
ionums	scanon	rite	openda	xxina	xxin
rcrdln	scanon				

Modules "eyenit", "jobnum", and "vecdif" are not used. Entry points "allowc", "ionums", "resetb", "resetc", "scanof", and "setbin" are never called.

Some externals are declared but never used:

External -----	Declared in -----
editor	kedit
master	kenova
statis	fisflx

#### 4. Common Block Irregularities

There are 30 common blocks in the KENO5A program.

The following common blocks are declared only once in the program:

Block -----	Declared in -----
fidasc	fidcom
punit	punt
rtab	fltrn

Common block variable exceptions are noted as follows:

Block -----	Variable -----	Exception -----
/angle/	mul	Undefined and unused
/angle/	iprin	Defined but unused
/dimen/	iaa	Undefined and unused
/dimen/	ihh	Undefined and unused
/errflg/	eerr	Undefined and unused
/fidasc/	iprtrg	Defined but unused
/lifetm/	lvel	Undefined and unused
/lifetm/	lprnt	Undefined and unused
/logic/	lpaxs	Undefined and unused
/logic/	lstgen	Defined but unused
/logic/	lextra	Undefined and unused
/lowbnd/	l15	Undefined and unused
/lowbnd/	l16	Undefined and unused
/lowbnd/	l17	Undefined and unused
/lowbnd/	l18	Undefined and unused
/lowbnd/	l19	Undefined and unused
/lowbnd/	l20	Undefined and unused
/matrx/	ngx	Used but undefined
/matrx/	ngy	Used but undefined
/matrx/	ngz	Used but undefined
/nutron/	xxk2	Used but possibly undefined
/nutron/	xxk4	Used but possibly undefined
/nutron/	xxk5	Used but possibly undefined
/nutron/	xxk6	Used but possibly undefined
/nutron/	xxk7	Used but possibly undefined
/nutron/	xxk8	Used but possibly undefined
/nutron/	nsplit	Undefined and unused



/punit/	npu	Defined but unused
/punit/	ncol	Defined but unused
/qrdbuf/	ten	Used but undefined
/runtyp/	bfalse	Defined but unused
/storag/	d	Possibly undefined
/uuuu/	i2	Defined but unused
/uuuu/	nspare	Defined but unused
/yrdbuf/	ad	Used but undefined
/yrdbuf/	d	Undefined and unused
/yrdbuf/	e	Undefined and unused
/yrdbuf/	fl	Used but undefined
/yrdbuf/	bb	Used but undefined
/yrdbuf/	blank	Used but undefined
/yrdbuf/	comma	Used but undefined

There are several instances of a common block not being used by a module in which it is declared:

Block name	Modules not using
/albnam/	albuse, corre, datain, difalb, fillsg, fldata, guide, kedit, limln, loadit, master, point, rdalb, sgalb, track, wrtalb
/dimen/	rdref
/drtacs/	fisflx, fitflx, icemix, looper, rdcalc, wrtcal
/final/	editor
/logic/	limln
/picttl/	mesh
/pointr/	kedit
/runtyp/	inital
/storag/	kenova
/titl/	arasiz, corsiz, geomin, icemix, master, point, prtplt, rdtape, readgm, track
/uuuu/	angles, aread, find, getmus, lread, master, matk, qrdbfr, statis
/yrdbuf/	scanon, y0read

Some common blocks have their contents altered by function subprograms:

Block name	Modifying functions
/dees/	fltrn
/qrdbuf/	aread, dread, zread
/rtab/	fltrn

Some common blocks have inconsistent layouts:

Block name	Different in	At variable
/angle/	getmus	idum
/angle/	legend	p1
/angle/	q	mean
/blkinc/	param	nb8
/letter/	lttr	caa

/nutron/	locate	v
/uuuu/	aread	idum

Common block /dimen/ differs in size at module "jstime". Common block /lifetm/ differs in size at module "rdcalc".

## 5. Interface Irregularities

Exceptions are noted as follows:

Module	Exception
-----	-----
albedo	"fltrn" is called with too many arguments (1, not 0)
albedo	"fltrn" is called with too many arguments (1, not 0)
albedo	"fltrn" is called with too many arguments (1, not 0)
albedo	"fltrn" is called with too many arguments (1, not 0)
albrd	argument #11 to "albuse" has the wrong type
albrd	argument #12 to "albuse" has the wrong type
albuse	argument #1 to "rite" has the wrong type
albuse	constant or expression passed to argument #2 of io, which modifies it
albuse	argument #1 to "rite" has the wrong type
arrayin	"stop" is called with too many arguments (6, not 1)
arrayin	argument #1 to "clear" has the wrong type
arrayin	argument #2 to "yread" has the wrong type
arrayin	argument #1 to "hlfwrdr" has the wrong type
arrayin	argument #2 to "hlfwrdr" has the wrong type
arrayin	argument #3 to "box" has the wrong type
arrayin	argument #1 to "clear" has the wrong type
arrayin	argument #2 to "rdbox" has the wrong type
arrayin	argument #3 to "box" has the wrong type
banker	argument #1 to "move" has the wrong type
banker	argument #2 to "move" has the wrong type
chkstr	argument #2 to "move" has the wrong type
choose	"fltrn" is called with too many arguments (1, not 0)
choose	"fltrn" is called with too many arguments (1, not 0)
choose	"fltrn" is called with too many arguments (1, not 0)
corre	argument #1 to "clear" has the wrong type
corre	argument #1 to "rite" has the wrong type
crmax	"stop" is called with too many arguments (2, not 1)
crmin	"stop" is called with too many arguments (2, not 1)
datain	argument #1 to "clear" has the wrong type
datain	argument #1 to "clear" has the wrong type
datain	argument #10 to "rtara" has the wrong type

datain	argument #11 to "rtara" has the wrong type
datain	argument #12 to "rtara" has the wrong type
datain	argument #13 to "rtara" has the wrong type
datain	argument #6 to "rtara" has the wrong type
datain	argument #7 to "rtara" has the wrong type
datain	argument #8 to "rtara" has the wrong type
datain	argument #9 to "rtara" has the wrong type
datain	argument #1 to "savst"6 has the wrong type
datain	constant or expression passed to argument #2
	of savst6, which modifies it
datain	argument #4 to "rdrst" has the wrong type
datain	"stop" is called with too many arguments (4,
	not 1)
datain	"stop" is called with too many arguments (4,
	not 1)
datain	argument #1 to "fldata" has the wrong type
datain	argument #11 to "fldata" has the wrong type
datain	argument #12 to "fldata" has the wrong type
datain	argument #13 to "fldata" has the wrong type
datain	argument #14 to "fldata" has the wrong type
datain	argument #15 to "fldata" has the wrong type
datain	argument #16 to "fldata" has the wrong type
datain	argument #17 to "fldata" has the wrong type
datain	argument #18 to "fldata" has the wrong type
datain	argument #19 to "fldata" has the wrong type
datain	argument #2 to "fldata" has the wrong type
datain	argument #20 to "fldata" has the wrong type
datain	argument #21 to "fldata" has the wrong type
datain	argument #22 to "fldata" has the wrong type
datain	argument #23 to "fldata" has the wrong type
datain	argument #24 to "fldata" has the wrong type
datain	argument #25 to "fldata" has the wrong type
datain	argument #26 to "fldata" has the wrong type
datain	argument #3 to "fldata" has the wrong type
datain	argument #4 to "fldata" has the wrong type
datain	argument #5 to "fldata" has the wrong type
datain	argument #6 to "fldata" has the wrong type
datain	argument #7 to "fldata" has the wrong type
datain	argument #8 to "fldata" has the wrong type
datain	argument #9 to "fldata" has the wrong type
fillsg	argument #1 to "clear" has the wrong type
fillsg	argument #1 to "reed" has the wrong type
fillsg	argument #3 to "fil"2"d" has the wrong type
fillsg	argument #1 to "sgalb" has the wrong type
fldata	argument #1 to "reed" has the wrong type
fldata	argument #1 to "rite" has the wrong type
fldata	argument #1 to "wates" has the wrong type
fldata	argument #10 to "wates" has the wrong type
fldata	argument #11 to "wates" has the wrong type
fldata	argument #2 to "wates" has the wrong type
fldata	argument #3 to "wates" has the wrong type
fldata	argument #5 to "wates" has the wrong type
fldata	argument #6 to "wates" has the wrong type
fldata	argument #8 to "wates" has the wrong type

fldata	argument #9 to "wates" has the wrong type
geomin	"stop" is called with too many arguments (6, not 1)
geomin	argument #1 to "clear" has the wrong type
geomin	argument #1 to "readgm" has the wrong type
geomin	argument #10 to "readgm" has the wrong type
geomin	argument #14 to "readgm" has the wrong type
geomin	argument #2 to "readgm" has the wrong type
geomin	argument #3 to "readgm" has the wrong type
geomin	argument #5 to "readgm" has the wrong type
geomin	argument #6 to "readgm" has the wrong type
geomin	argument #7 to "readgm" has the wrong type
geomin	argument #8 to "readgm" has the wrong type
geomin	argument #9 to "readgm" has the wrong type
guide	"pull" is called with too many arguments (3, not 0)
guide	argument #26 to "start" has the wrong type
guide	argument #30 to "start" has the wrong type
guide	"pull" is called with too many arguments (1, not 0)
guide	argument #1 to "clear" has the wrong type
guide	argument #1 to "clear" has the wrong type
guide	argument #1 to "clear" has the wrong type
guide	argument #1 to "clear" has the wrong type
guide	argument #1 to "clear" has the wrong type
guide	argument #1 to "clear" has the wrong type
guide	argument #1 to "clear" has the wrong type
guide	argument #1 to "clear" has the wrong type
guide	"pull" is called with too many arguments (3, not 0)
guide	argument #1 to "indx" has the wrong type
guide	argument #28 to "track" has the wrong type
guide	argument #37 to "track" has the wrong type
guide	"pull" is called with too many arguments (1, not 0)
guide	"pull" is called with too many arguments (1, not 0)
holchk	argument #4 to "adjust" has the wrong type
holchk	argument #5 to "adjust" has the wrong type
holchk	argument #6 to "adjust" has the wrong type
hole	"stop" is called with too many arguments (4, not 1)
hunter	argument #1 to "move" has the wrong type
hunter	argument #2 to "move" has the wrong type
icemix	argument #1 to "rdtape" has the wrong type
icemix	argument #6 to "rdtape" has the wrong type
icemix	argument #7 to "rdtape" has the wrong type
icemix	argument #8 to "rdtape" has the wrong type
jomity	argument #10 to "corsiz" has the wrong type
jomity	argument #11 to "corsiz" has the wrong type
jomity	argument #12 to "corsiz" has the wrong type
jomity	argument #13 to "corsiz" has the wrong type
jomity	argument #14 to "corsiz" has the wrong type

jomity	argument #15 to "corsiz" has the wrong type
jomity	argument #16 to "corsiz" has the wrong type
jomity	argument #17 to "corsiz" has the wrong type
jomity	argument #18 to "corsiz" has the wrong type
jomity	argument #19 to "corsiz" has the wrong type
jomity	argument #5 to "corsiz" has the wrong type
jomity	argument #6 to "corsiz" has the wrong type
jomity	argument #7 to "corsiz" has the wrong type
jomity	argument #8 to "corsiz" has the wrong type
jomity	argument #9 to "corsiz" has the wrong type
jomity	argument #1 to "prtjom" has the wrong type
jomity	argument #10 to "prtjom" has the wrong type
jomity	argument #14 to "prtjom" has the wrong type
jomity	argument #2 to "prtjom" has the wrong type
jomity	argument #3 to "prtjom" has the wrong type
jomity	argument #5 to "prtjom" has the wrong type
jomity	argument #6 to "prtjom" has the wrong type
jomity	argument #7 to "prtjom" has the wrong type
jomity	argument #8 to "prtjom" has the wrong type
jomity	argument #9 to "prtjom" has the wrong type
jomity	argument #1 to "aralba" has the wrong type
jomity	argument #2 to "aralba" has the wrong type
jomity	argument #3 to "aralba" has the wrong type
jomity	argument #4 to "aralba" has the wrong type
jomity	argument #5 to "aralba" has the wrong type
jomity	argument #6 to "aralba" has the wrong type
jomity	argument #7 to "aralba" has the wrong type
jomity	argument #2 to "jomchk" has the wrong type
jomity	argument #3 to "jomchk" has the wrong type
jomity	argument #4 to "jomchk" has the wrong type
jomity	argument #5 to "jomchk" has the wrong type
jomity	argument #6 to "jomchk" has the wrong type
jomity	argument #7 to "jomchk" has the wrong type
jomity	argument #8 to "jomchk" has the wrong type
jomity	argument #9 to "jomchk" has the wrong type
jomity	argument #10 to "volume" has the wrong type
jomity	argument #11 to "volume" has the wrong type
jomity	argument #12 to "volume" has the wrong type
jomity	argument #13 to "volume" has the wrong type
jomity	argument #14 to "volume" has the wrong type
jomity	argument #15 to "volume" has the wrong type
jomity	argument #16 to "volume" has the wrong type
jomity	argument #17 to "volume" has the wrong type
jomity	argument #18 to "volume" has the wrong type
jomity	argument #19 to "volume" has the wrong type
jomity	argument #2 to "volume" has the wrong type
jomity	argument #20 to "volume" has the wrong type
jomity	argument #21 to "volume" has the wrong type
jomity	argument #22 to "volume" has the wrong type
jomity	argument #23 to "volume" has the wrong type
jomity	argument #24 to "volume" has the wrong type
jomity	argument #25 to "volume" has the wrong type
jomity	argument #3 to "volume" has the wrong type
jomity	argument #4 to "volume" has the wrong type

jomity	argument #7 to "volume" has the wrong type
jomity	argument #8 to "volume" has the wrong type
jomity	argument #9 to "volume" has the wrong type
loadit	argument #10 to "lodara" has the wrong type
loadit	argument #11 to "lodara" has the wrong type
loadit	argument #12 to "lodara" has the wrong type
loadit	argument #13 to "lodara" has the wrong type
loadit	argument #14 to "lodara" has the wrong type
loadit	argument #15 to "lodara" has the wrong type
loadit	argument #16 to "lodara" has the wrong type
loadit	argument #17 to "lodara" has the wrong type
loadit	argument #18 to "lodara" has the wrong type
loadit	argument #19 to "lodara" has the wrong type
loadit	argument #23 to "lodara" has the wrong type
loadit	argument #24 to "lodara" has the wrong type
loadit	argument #25 to "lodara" has the wrong type
loadit	argument #26 to "lodara" has the wrong type
loadit	argument #27 to "lodara" has the wrong type
loadit	argument #28 to "lodara" has the wrong type
loadit	argument #4 to "lodara" has the wrong type
loadit	argument #5 to "lodara" has the wrong type
loadit	argument #6 to "lodara" has the wrong type
loadit	argument #7 to "lodara" has the wrong type
loadit	argument #8 to "lodara" has the wrong type
loadit	argument #9 to "lodara" has the wrong type
loadit	argument #1 to "prtara" has the wrong type
loadit	argument #2 to "prtara" has the wrong type
loadit	argument #3 to "prtara" has the wrong type
loadit	argument #4 to "prtara" has the wrong type
loadit	argument #5 to "prtara" has the wrong type
loadit	argument #1 to "boxc" has the wrong type
loadit	argument #2 to "boxc" has the wrong type
loadit	argument #3 to "boxc" has the wrong type
loadit	argument #4 to "lodalb" has the wrong type
loadit	argument #5 to "lodalb" has the wrong type
locate	argument #1 to "move" has the wrong type
locate	argument #2 to "move" has the wrong type
lodalb	argument #1 to "reed" has the wrong type
lodara	argument #1 to "reed" has the wrong type
lodara	argument #1 to "reed" has the wrong type
lodwts	argument #1 to "reed" has the wrong type
lodwts	argument #1 to "clear" has the wrong type
makang	argument #1 to "reed" has the wrong type
makang	"stop" is called with too many arguments (2, not 1)
maktap	constant or expression passed to argument #2 of io, which modifies it
maktap	argument #1 to "reed" has the wrong type
maktap	constant or expression passed to argument #2 of io, which modifies it
maktap	constant or expression passed to argument #2 of io, which modifies it
maktap	constant or expression passed to argument #2 of io, which modifies it
maktap	constant or expression passed to argument #2 of io, which modifies it

```
master      argument #3 to "datain" has the wrong type
master      argument #3 to "mixer" has the wrong type
master      argument #2 to "icemix" has the wrong type
master      argument #3 to "wrtrst" has the wrong type
master      argument #4 to "wrtrst" has the wrong type
master      argument #3 to "corre" has the wrong type
master      argument #4 to "corre" has the wrong type
master      argument #10 to "nsupg" has the wrong type
master      argument #11 to "nsupg" has the wrong type
master      argument #12 to "nsupg" has the wrong type
master      argument #13 to "nsupg" has the wrong type
master      argument #14 to "nsupg" has the wrong type
master      argument #15 to "nsupg" has the wrong type
master      argument #16 to "nsupg" has the wrong type
master      argument #17 to "nsupg" has the wrong type
master      argument #6 to "nsupg" has the wrong type
master      argument #7 to "nsupg" has the wrong type
master      argument #8 to "nsupg" has the wrong type
master      argument #9 to "nsupg" has the wrong type
master      argument #4 to "lodwts" has the wrong type
master      argument #5 to "lodwts" has the wrong type
master      argument #6 to "lodwts" has the wrong type
master      argument #7 to "lodwts" has the wrong type
master      argument #8 to "lodwts" has the wrong type
master      "stop" is called with too many arguments (7,
not 1)
master      argument #10 to "prtplt" has the wrong type
master      argument #11 to "prtplt" has the wrong type
master      argument #12 to "prtplt" has the wrong type
master      argument #13 to "prtplt" has the wrong type
master      argument #14 to "prtplt" has the wrong type
master      argument #15 to "prtplt" has the wrong type
master      argument #16 to "prtplt" has the wrong type
master      argument #17 to "prtplt" has the wrong type
master      argument #19 to "prtplt" has the wrong type
master      argument #20 to "prtplt" has the wrong type
master      argument #21 to "prtplt" has the wrong type
master      argument #26 to "prtplt" has the wrong type
master      argument #27 to "prtplt" has the wrong type
master      argument #28 to "prtplt" has the wrong type
master      argument #29 to "prtplt" has the wrong type
master      argument #30 to "prtplt" has the wrong type
master      argument #31 to "prtplt" has the wrong type
master      argument #32 to "prtplt" has the wrong type
master      argument #5 to "prtplt" has the wrong type
master      argument #6 to "prtplt" has the wrong type
master      argument #7 to "prtplt" has the wrong type
master      argument #8 to "prtplt" has the wrong type
master      argument #9 to "prtplt" has the wrong type
master      argument #1 to "clear" has the wrong type
master      argument #1 to "guide" has the wrong type
master      argument #11 to "guide" has the wrong type
master      argument #12 to "guide" has the wrong type
master      argument #13 to "guide" has the wrong type
```

master	argument #14 to "guide" has the wrong type
master	argument #19 to "guide" has the wrong type
master	argument #2 to "guide" has the wrong type
master	argument #20 to "guide" has the wrong type
master	argument #3 to "guide" has the wrong type
master	argument #36 to "guide" has the wrong type
master	argument #38 to "guide" has the wrong type
master	argument #39 to "guide" has the wrong type
master	argument #4 to "guide" has the wrong type
master	argument #46 to "guide" has the wrong type
master	argument #47 to "guide" has the wrong type
master	argument #48 to "guide" has the wrong type
master	argument #5 to "guide" has the wrong type
master	argument #53 to "guide" has the wrong type
master	argument #54 to "guide" has the wrong type
master	argument #55 to "guide" has the wrong type
master	argument #56 to "guide" has the wrong type
master	argument #57 to "guide" has the wrong type
master	argument #58 to "guide" has the wrong type
master	argument #59 to "guide" has the wrong type
master	argument #6 to "guide" has the wrong type
master	argument #60 to "guide" has the wrong type
master	argument #61 to "guide" has the wrong type
master	argument #62 to "guide" has the wrong type
master	argument #66 to "guide" has the wrong type
master	argument #67 to "guide" has the wrong type
master	argument #68 to "guide" has the wrong type
master	argument #69 to "guide" has the wrong type
master	argument #8 to "guide" has the wrong type
master	argument #9 to "guide" has the wrong type
master	argument #22 to "kedit" has the wrong type
master	argument #25 to "kedit" has the wrong type
master	argument #26 to "kedit" has the wrong type
master	argument #27 to "kedit" has the wrong type
master	argument #28 to "kedit" has the wrong type
master	argument #4 to "kedit" has the wrong type
master	argument #5 to "kedit" has the wrong type
master	argument #6 to "kedit" has the wrong type
master	argument #7 to "kedit" has the wrong type
master	argument #2 to "fitflx" has the wrong type
master	argument #3 to "fitflx" has the wrong type
master	argument #4 to "fitflx" has the wrong type
master	argument #5 to "fitflx" has the wrong type
master	argument #6 to "fitflx" has the wrong type
master	argument #7 to "fitflx" has the wrong type
master	argument #8 to "fitflx" has the wrong type
master	argument #1 to "freak" has the wrong type
matk	argument #1 to "clear" has the wrong type
mesh	argument #1 to "clear" has the wrong type
mesh	argument #1 to "clear" has the wrong type
mesh	argument #17 to "locate" has the wrong type
mesh	argument #22 to "locate" has the wrong type
mixcrs	"stop" is called with too many arguments (2, not 1)



mixer	argument #1 to "mixcrs" has the wrong type
mixer	argument #2 to "mixcrs" has the wrong type
mixer	"stop" is called with too many arguments (2, not 1)
mixer	argument #1 to "jll"2 has the wrong type
mixer	argument #1 to "xlnths" has the wrong type
mixer	argument #2 to "xlnths" has the wrong type
mixer	argument #1 to "mixmix" has the wrong type
mixer	argument #2 to "mixmix" has the wrong type
mixer	argument #21 to "mixmix" has the wrong type
mixer	argument #22 to "mixmix" has the wrong type
mixer	argument #24 to "mixmix" has the wrong type
mixer	argument #26 to "mixmix" has the wrong type
mixer	argument #4 to "mixmix" has the wrong type
mixer	"stop" is called with too many arguments (2, not 1)
mixer	argument #1 to "makang" has the wrong type
mixer	argument #2 to "makang" has the wrong type
mixer	argument #3 to "makang" has the wrong type
mixer	argument #4 to "makang" has the wrong type
mixer	argument #6 to "makang" has the wrong type
mixer	argument #7 to "makang" has the wrong type
mixer	argument #10 to "maktap" has the wrong type
mixer	argument #13 to "maktap" has the wrong type
mixer	argument #7 to "maktap" has the wrong type
mixer	argument #8 to "maktap" has the wrong type
mixer	argument #9 to "maktap" has the wrong type
mixit	"stop" is called with too many arguments (2, not 1)
mixit	argument #1 to "rdmixt" has the wrong type
mixit	argument #2 to "rdmixt" has the wrong type
mixmix	constant or expression passed to argument #2 of io, which modifies it
mixmix	argument #1 to "io" has the wrong type
mixmix	constant or expression passed to argument #2 of io, which modifies it
mixmix	argument #1 to "io" has the wrong type
mixmix	constant or expression passed to argument #2 of io, which modifies it
mixmix	constant or expression passed to argument #2 of io, which modifies it
mixmix	argument #9 to "mix"1"d" has the wrong type
mixmix	argument #1 to "cmprs" has the wrong type
mixmix	argument #2 to "sumsct" has the wrong type
mixmix	argument #2 to "norm"2"d" has the wrong type
mixmix	argument #1 to "cmprs" has the wrong type
mixmix	argument #2 to "norm"2"d" has the wrong type
nnitl	argument #1 to "clear" has the wrong type
nstart	argument #2 to "sortbk" cannot be passed to a scalar
nstart	argument #8 to "sortbk" has the wrong type
nstart	"fltrn" is called with too many arguments (1, not 0)
nstart	argument #1 to "move" has the wrong type

nstart	argument #2 to "move" has the wrong type
nsupg	argument #1 to "reed" has the wrong type
nsupg	argument #1 to "reed" has the wrong type
nsupg	argument #1 to "reed" has the wrong type
nsupg	argument #1 to "reed" has the wrong type
nsupg	argument #1 to "rite" has the wrong type
nsupg	argument #1 to "reed" has the wrong type
nsupg	argument #1 to "reed" has the wrong type
nsupg	argument #1 to "reed" has the wrong type
nsupg	argument #1 to "limln" has the wrong type
nsupg	argument #4 to "limln" has the wrong type
nsupg	argument #10 to "fillsg" has the wrong type
nsupg	argument #11 to "fillsg" has the wrong type
nsupg	argument #12 to "fillsg" has the wrong type
nsupg	argument #6 to "fillsg" has the wrong type
nsupg	argument #7 to "fillsg" has the wrong type
nsupg	argument #8 to "fillsg" has the wrong type
nsupg	"stop" is called with too many arguments (2, not 1)
param	argument #1 to "clear" has the wrong type
prtlba	"stop" is called with too many arguments (2, not 1)
prtxs	argument #1 to "reed" has the wrong type
prtxs	argument #1 to "reed" has the wrong type
rchr	"stop" is called with too many arguments (4, not 1)
rdalb	argument #1 to "io" has the wrong type
rdalb	argument #1 to "rite" has the wrong type
rdalb	constant or expression passed to argument #2 of io, which modifies it
rdalb	argument #1 to "rite" has the wrong type
rdara	argument #1 to "io" has the wrong type
rdara	argument #1 to "rite" has the wrong type
rdbias	argument #1 to "waitin" has the wrong type
rdbias	argument #10 to "waitin" has the wrong type
rdbias	argument #11 to "waitin" has the wrong type
rdbias	argument #2 to "waitin" has the wrong type
rdbias	argument #3 to "waitin" has the wrong type
rdbias	argument #4 to "waitin" has the wrong type
rdbias	argument #5 to "waitin" has the wrong type
rdbias	argument #6 to "waitin" has the wrong type
rdbias	argument #9 to "waitin" has the wrong type
rdcalc	constant or expression passed to argument #2 of io, which modifies it
rdcalc	constant or expression passed to argument #2 of io, which modifies it
rdcalc	constant or expression passed to argument #2 of io, which modifies it
rdcalc	constant or expression passed to argument #2 of io, which modifies it
rdice	argument #1 to "rite" has the wrong type
rdice	argument #1 to "rite" has the wrong type
rdice	argument #1 to "io" has the wrong type
rdice	argument #1 to "rite" has the wrong type

rdice	argument #1 to "rite" has the wrong type
rdplot	argument #1 to "clear" has the wrong type
rdplot	argument #1 to "clear" has the wrong type
rdplot	constant or expression passed to argument #2 of io, which modifies it
rdrst	argument #1 to "io" has the wrong type
rdrst	argument #1 to "io" has the wrong type
rdrst	argument #1 to "rite" has the wrong type
rdrst	argument #12 to "rdara" has the wrong type
rdrst	argument #1 to "rite" has the wrong type
rdrst	argument #3 to "rdalb" has the wrong type
rdrst	argument #14 to "rdwts" has the wrong type
rdrst	argument #6 to "rdwts" has the wrong type
rdrst	argument #9 to "rdwts" has the wrong type
rdrst	argument #1 to "io" has the wrong type
rdrst	argument #1 to "rite" has the wrong type
rdrst	argument #1 to "io" has the wrong type
rdrst	argument #1 to "rite" has the wrong type
rdstrt	argument #1 to "clear" has the wrong type
rdstrt	argument #1 to "io" has the wrong type
rdstrt	constant or expression passed to argument #2 of io, which modifies it
rdstrt	argument #1 to "io" has the wrong type
rdstrt	constant or expression passed to argument #2 of io, which modifies it
rdstrt	argument #1 to "io" has the wrong type
rdstrt	constant or expression passed to argument #2 of io, which modifies it
rdtape	argument #1 to "rite" has the wrong type
rdtape	argument #1 to "rite" has the wrong type
rdtape	argument #1 to "io" has the wrong type
rdtape	argument #1 to "clear" has the wrong type
rdtape	argument #1 to "xsec"l"d" has the wrong type
rdtape	argument #1 to "rite" has the wrong type
rdtape	argument #1 to "rite" has the wrong type
rdwts	argument #1 to "io" has the wrong type
rdwts	argument #1 to "rite" has the wrong type
reset	argument #2 to "move" has the wrong type
reset	argument #1 to "move" has the wrong type
reset	argument #2 to "move" has the wrong type
rtara	argument #1 to "rite" has the wrong type
rtara	argument #1 to "rite" has the wrong type
savst6	"stop" is called with too many arguments (6, not 1)
savst6	argument #1 to "io" has the wrong type
savst6	argument #1 to "move" has the wrong type
savst6	argument #2 to "move" has the wrong type
savst6	argument #1 to "rite" has the wrong type
sgalb	argument #1 to "reed" has the wrong type
sgalb	argument #2 to "rd" has the wrong type
sorta	"stop" is called with too many arguments (4, not 1)
sorta	argument #1 to "reed" has the wrong type
sorta	"stop" is called with too many arguments (7,

```

not 1)
sorta      argument #1 to "reed" has the wrong type
sortbk     argument #1 to "move" has the wrong type
sortbk     argument #1 to "gtiso" has the wrong type
sortbk     argument #2 to "gtiso" has the wrong type
sortbk     argument #3 to "gtiso" has the wrong type
sortbk     argument #1 to "move" has the wrong type
srmax      "stop" is called with too many arguments (2,
not 1)
srmin      "stop" is called with too many arguments (2,
not 1)
start      "stop" is called with too many arguments (4,
not 1)
start      "stop" is called with too many arguments (4,
not 1)
start      "stop" is called with too many arguments (4,
not 1)
start      "stop" is called with too many arguments (4,
not 1)
start      "stop" is called with too many arguments (4,
not 1)
start      "stop" is called with too many arguments (4,
not 1)
start      "stop" is called with too many arguments (4,
not 1)
start      "stop" is called with too many arguments (4,
not 1)
start      "stop" is called with too many arguments (4,
not 1)
start      "stop" is called with too many arguments (4,
not 1)
start      "stop" is called with too many arguments (4,
not 1)
start      argument #10 to "start"6 has the wrong type
start      argument #1 to "clear" has the wrong type
start      argument #1 to "clear" has the wrong type
start      argument #17 to "locate" has the wrong type
start      argument #22 to "locate" has the wrong type
start      "fltrn" is called with too many arguments (1,
not 0)
start      "fltrn" is called with too many arguments (1,
not 0)
start      argument #1 to "move" has the wrong type
start      argument #1 to "move" has the wrong type
start      argument #1 to "move" has the wrong type
start      "fltrn" is called with too many arguments (1,
not 0)
start      argument #1 to "move" has the wrong type
start      argument #2 to "move" has the wrong type
start0     "fltrn" is called with too many arguments (1,
not 0)
start0     "fltrn" is called with too many arguments (1,
not 0)
start0     "fltrn" is called with too many arguments (1,
not 0)
start0     "fltrn" is called with too many arguments (1,
not 0)
start1     "fltrn" is called with too many arguments (1,

```

```
not 0)
start1 "fltrn" is called with too many arguments (1,
not 0)
start1 "fltrn" is called with too many arguments (1,
not 0)
start5 "fltrn" is called with too many arguments (1,
not 0)
start5 "fltrn" is called with too many arguments (1,
not 0)
start5 "fltrn" is called with too many arguments (1,
not 0)
start6 argument #1 to "reed" has the wrong type
start6 argument #2 to "move" has the wrong type
start6 argument #1 to "move" has the wrong type
start6 argument #2 to "move" has the wrong type
start6 argument #1 to "move" has the wrong type
start6 argument #2 to "move" has the wrong type
start6 argument #1 to "icompa" has the wrong type
start6 argument #2 to "icompa" has the wrong type
strtsu "fltrn" is called with too many arguments (1,
not 0)
strtsu "fltrn" is called with too many arguments (1,
not 0)
strtsu "fltrn" is called with too many arguments (1,
not 0)
strtsu "fltrn" is called with too many arguments (1,
not 0)
strtsu "fltrn" is called with too many arguments (1,
not 0)
strtsu "fltrn" is called with too many arguments (1,
not 0)
strtsu "fltrn" is called with too many arguments (1,
not 0)
strtsu "fltrn" is called with too many arguments (1,
not 0)
strtsu "fltrn" is called with too many arguments (1,
not 0)
strtsu "sflra" is called with too many arguments (1,
not 0)
strtsu "fltrn" is called with too many arguments (1,
not 0)
track argument #2 to "move" has the wrong type
track argument #1 to "move" has the wrong type
track argument #2 to "move" has the wrong type
track argument #1 to "move" has the wrong type
track argument #2 to "move" has the wrong type
track argument #1 to "move" has the wrong type
track argument #2 to "move" has the wrong type
track argument #1 to "move" has the wrong type
track argument #2 to "move" has the wrong type
track "fltrn" is called with too many arguments (1,
not 0)
track "exprn" is called with too many arguments (1,
not 0)
```

track	argument #1 to "move" has the wrong type
track	argument #2 to "move" has the wrong type
track	argument #1 to "move" has the wrong type
track	argument #2 to "move" has the wrong type
track	argument #1 to "move" has the wrong type
track	argument #2 to "move" has the wrong type
track	argument #1 to "move" has the wrong type
track	argument #2 to "move" has the wrong type
track	"fltrn" is called with too many arguments (1, not 0)
track	argument #1 to "move" has the wrong type
track	argument #2 to "move" has the wrong type
track	argument #1 to "move" has the wrong type
track	argument #1 to "move" has the wrong type
track	argument #2 to "move" has the wrong type
track	argument #1 to "move" has the wrong type
track	argument #2 to "move" has the wrong type
track	"fltrn" is called with too many arguments (1, not 0)
track	"fltrn" is called with too many arguments (1, not 0)
track	"sflra" is called with too many arguments (1, not 0)
track	"fltrn" is called with too many arguments (1, not 0)
track	"fltrn" is called with too many arguments (1, not 0)
track	"fltrn" is called with too many arguments (1, not 0)
track	argument #2 to "move" has the wrong type
track	argument #2 to "move" has the wrong type
track	argument #1 to "move" has the wrong type
track	argument #1 to "move" has the wrong type
track	argument #2 to "move" has the wrong type
track	argument #1 to "move" has the wrong type
track	argument #2 to "move" has the wrong type
volume	argument #1 to "move" has the wrong type
volume	argument #2 to "move" has the wrong type
volume	argument #1 to "clear" has the wrong type
waitin	argument #1 to "rite" has the wrong type
wates	argument #1 to "reed" has the wrong type
wates	"stop" is called with too many arguments (7, not 1)
wates	constant or expression passed to argument #2 of io, which modifies it
wates	argument #1 to "rite" has the wrong type
wrtalb	argument #1 to "reed" has the wrong type
wrtalb	argument #1 to "io" has the wrong type
wrtalb	constant or expression passed to argument #2 of io, which modifies it
wrtara	argument #1 to "reed" has the wrong type
wrtara	argument #1 to "io" has the wrong type
wrtcal	constant or expression passed to argument #2 of io, which modifies it

```

wrtcal      constant or expression passed to argument #2
             of io, which modifies it
wrtcal      constant or expression passed to argument #2
             of io, which modifies it
wrtcal      constant or expression passed to argument #2
             of io, which modifies it
wrtice      argument #1 to "reed" has the wrong type
wrtice      argument #1 to "reed" has the wrong type
wrtice      argument #1 to "io" has the wrong type
wrtice      argument #1 to "reed" has the wrong type
wrtice      argument #1 to "io" has the wrong type
wrtrst      argument #1 to "reed" has the wrong type
wrtrst      argument #1 to "io" has the wrong type
wrtrst      argument #3 to "wrtalb" has the wrong type
wrtrst      argument #1 to "reed" has the wrong type
wrtrst      argument #1 to "reed" has the wrong type
wrtrst      argument #1 to "io" has the wrong type
wrtrst      argument #14 to "wrtwts" has the wrong type
wrtrst      argument #6 to "wrtwts" has the wrong type
wrtrst      argument #9 to "wrtwts" has the wrong type
wrtrst      argument #1 to "reed" has the wrong type
wrtrst      argument #1 to "io" has the wrong type
wrtwts      argument #1 to "reed" has the wrong type
wrtwts      argument #1 to "io" has the wrong type

```

## 6. Local Variable Irregularities

Parameter usage is consistent.

Local variable exceptions are noted as follows:

Module	Variable	Exception
albrd	axxxx	UNUSED
albrd	vxxxxx	UNUSED
arasiz	mretrn	Defined, Unused
arain	dum	Defined, Unused
arain	rnam2	Defined, Unused
arain	rnam3	Defined, Unused
aread	di	Undefined, Unused
aread	dread	Undefined, Unused
aread	frac	Undefined, Unused
aread	zread	Undefined, Unused
chkstr	d1	Defined, Unused
chkstr	ngp	UNUSED
chkstr	r	Defined, Unused
corsiz	delxx	Undefined, Unused
corsiz	delyy	Undefined, Unused
corsiz	delzz	Undefined, Unused
corsiz	ltest	Undefined, Unused
crmin	iqa	Undefined, Unused
datain	dum	Defined, Unused
datain	enam2	Defined, Unused
datain	enam3	Defined, Unused

datain	lnxt	Defined, Unused
datain	loop	Undefined, Unused
datain	rnam2	Defined, Unused
datain	rnam3	Defined, Unused
difalb	ncnt	Defined, Unused
dread	equals	Undefined, Unused
dread	zread	Undefined, Unused
dtaset	log	UNUSED
editor	flux	UNUSED
editor	fnpb	UNUSED
editor	iend	UNUSED
editor	vol	UNUSED
extra	a	UNUSED
extra	iret	UNUSED
fil2d	lxs	UNUSED
fillsg	len	Defined, Unused
fitflx	ij2	Defined, Unused
fldata	lshrt	Defined, Unused
freecr	l	UNUSED
guide	lend	Defined, Unused
guide	nblk	Defined, Unused
guide	sigma	Defined, Unused
hlfrwd	ll	UNUSED
hole	nar	UNUSED
holext	iflag	Defined, Unused
holhol	iflag	Defined, Unused
inital	dummy	Defined, Unused
inital	irflag	Defined, Unused
jomchk	iflag	Defined, Unused
jszero	itstrt	UNUSED
labl	albdo	Undefined, Unused
labl	rstrt	Undefined, Unused
labl	skrt	Undefined, Unused
labl	wstrt	Undefined, Unused
labl	wts	Undefined, Unused
labl	xsecs	Undefined, Unused
listqa	job	Undefined, Unused
lodalb	llngth	UNUSED
lread	di	Undefined, Unused
lread	dread	Undefined, Unused
lread	equals	Undefined, Unused
lread	frac	Undefined, Unused
lread	iz	UNUSED
lread	zread	Undefined, Unused
mixld	nou	UNUSED
mixld	nx	Defined, Unused
mix2d	nou	UNUSED
mix2m	nou	UNUSED
normld	nng	UNUSED
nsupg	labs	UNUSED
nsupg	maxt	Defined, Unused
openda	bal	Undefined, Unused
openda	filnam	Undefined, Unused
openda	nrr	UNUSED



param	dum	Defined, Unused
param	dummy	Defined, Unused
param	lfmsg	Defined, Unused
param	lmsg	Defined, Unused
param	lnb	Defined, Unused
param	nio	Defined, Unused
param	tbtchs	Defined, Unused
param	tmaxs	Defined, Unused
point	d	UNUSED
prtjom	lsing	Undefined, Unused
prtlba	lll	Undefined, Unused
prtplt	iregc	UNUSED
prtplt	lflag	Undefined, Unused
prtplt	nck	Defined, Unused
qrdbr	di	Undefined, Unused
qrdbr	dread	Undefined, Unused
qrdbr	equals	Undefined, Unused
qrdbr	frac	Undefined, Unused
qrdbr	zread	Undefined, Unused
rchr	dum	Defined, Unused
rchr	ll	Used before being defined (rcrdln)
rdara	mflag	UNUSED
rdara	nbxmx	UNUSED
rdara	nbymx	UNUSED
rdara	nbzmx	UNUSED
rdbias	dum	Undefined, Unused
rdbox	iret	UNUSED
rdcalc	lsgl	UNUSED
rdplot	blnkfl	Defined, Unused
rdplot	dum	Defined, Unused
rdplot	wdum	Defined, Unused
rdplot	wend	Defined, Unused
rdrst	lwrt	Undefined, Unused
rdrst	ngpo	Defined, Unused
rdwts	crdttl	UNUSED
rdwts	ibgn	UNUSED
rdwts	iend	UNUSED
rdwts	ncid	UNUSED
rdwts	ncsets	UNUSED
rdwts	ncthk	UNUSED
rdwts	wttitl	UNUSED
rtara	length	UNUSED
savst6	lpoint	UNUSED
scanon	di	Undefined, Unused
scanon	dread	Undefined, Unused
scanon	equals	Undefined, Unused
scanon	frac	Undefined, Unused
scanon	zread	Undefined, Unused
sgwt	llngth	UNUSED
sorta	itype	UNUSED
sorta	khole	UNUSED
sorta	lhflg	Undefined, Unused
sorta	llngth	UNUSED
sorta	maxh	Defined, Unused

sortbk	ias	UNUSED
sortbk	ihs	UNUSED
sortbk	nfsbk	UNUSED
statis	iend	UNUSED
statis	iregc	UNUSED
statis	istrt	UNUSED
statis	kbnds1	UNUSED
statis	kbnds2	UNUSED
strtsu	ip	Defined, Unused
track	isc	Defined, Unused
track	kmax1	Used before being defined (ldwrt)
track	lim	UNUSED
track	xtra	UNUSED
volume	kboxc	UNUSED
volume	nesta1	UNUSED
wates	ncthk	UNUSED
wrtara	nbxmx	UNUSED
wrtara	nbymx	UNUSED
wrtara	nbzmx	UNUSED
wrtcal	lsgl	UNUSED
wrtgrp	iend	UNUSED
wrtwts	crdtt1	UNUSED
wrtwts	ibgn	UNUSED
wrtwts	iend	UNUSED
wrtwts	ncid	UNUSED
wrtwts	ncsets	UNUSED
wrtwts	ncthk	UNUSED
wrtwts	wttit1	UNUSED
xrmin	dprd	Defined, Unused
y0read	di	Undefined, Unused
y0read	dread	Undefined, Unused
y0read	equals	Undefined, Unused
y0read	frac	Undefined, Unused
y0read	zread	Undefined, Unused
yread	di	Undefined, Unused
yread	equals	Undefined, Unused
yread	frac	Undefined, Unused
yread	zread	Undefined, Unused
yread	vs	Undefined, Unused
yread	vslow	USED but UNDEFINED
yread	vn	Undefined, Unused
yread	vlow	USED but UNDEFINED
zread	di	Undefined, Unused
zread	dread	Undefined, Unused
zread	equals	Undefined, Unused
zread	frac	Undefined, Unused

## 7. Fortran Extensions

Module "arrayin" calls the non-standard intrinsic function "ior". Module "prtlba" calls the non-standard intrinsic function "iand".

Module "param" contains 4 potential overlaps in character assignment statements.

The following modules contain lowercase characters in their active Fortran:

albedo, albrd, track.

Module "guide" calls "pull" with inconsistent argument counts. Module "sorta" calls "stop" with inconsistent argument counts.

Module "fillsg" has 3 format statements which contain fields not separated by a comma.

The following modules use the z formatted edit descriptor:

kedit, param, trkwrt, wrtcal.

## 8. Optimization

The following table summarizes the performance data gathered from execution of the sample problem. Only those routines exercised by the sample problem are shown (see "Coverage Analysis" for a list of routines not exercised by the sample problem, i.e., coverage = 0%). The table lists all program modules in descending order according to CPU time. To optimize code execution time, emphasis should be placed on those modules which appear highest in the listing.

The performance data show that a high percentage of the overall execution time (90.449%) is spent in the first 10 routines listed. This is due primarily to the following (applies to some or all of the 10 routines):

- 1) a low percentage of floating point operations which are performed in vector mode (%Vflops is small)
- 2) a high overhead factor for calls to the routines (IFact > 1)
- 3) a high level of memory conflicts (MC/MR > 1)
- 4) a high rate of instruction buffer fetches (IBFR > 1).

A detailed optimization analysis effort should focus on these 4 areas.

### PERFORMANCE DATA FOR KENO5A

ROUTINE NAME	Time	%ExTime	%AccumT	%Vflops	IFact	MC/MR	IBFR
TRACK	3.485	35.030	35.030	14.00599	0.00	1.416	1.194
FLTRN	1.922	19.324	54.354	0.00000	642.04	3.026	0.992
GTISO	0.665	6.688	61.042	0.00099	73.61	1.793	1.485
MOVE	0.619	6.221	67.264	0.00000	849.25	1.322	1.206
AZIRN	0.528	5.306	72.570	0.00000	92.79	1.592	1.152
SORTBK	0.473	4.751	77.321	0.00000	0.00	1.095	0.721
EXPRN	0.444	4.467	81.788	0.00000	109.34	1.881	1.192
CROS	0.385	3.871	85.659	0.00000	72.58	2.020	1.124
RESET	0.276	2.770	88.429	0.00000	0.00	1.293	1.683
LOCATE	0.201	2.019	90.449	100.00000	10.55	1.453	0.899
BANKER	0.159	1.595	92.044	0.00000	0.00	1.213	1.172
PRINT	0.119	1.197	93.241	94.97017	0.00	0.811	0.947

PLTKEF	0.109	1.096	94.337	35.96434	0.00	0.713	0.900
TIMER	0.105	1.052	95.388	0.00000	0.02	0.892	0.785
POSIT	0.094	0.949	96.338	0.00000	22.45	2.093	1.286
MESH	0.094	0.942	97.280	0.01849	0.00	1.338	1.161
START	0.031	0.317	97.596	80.24582	0.00	1.267	1.389
STRTSU	0.028	0.278	97.875	0.07314	1.59	2.121	1.480
OPENDA	0.022	0.220	98.094	17.31602	0.00	1.097	0.938
FISFLX	0.021	0.210	98.304	46.35775	0.00	0.727	0.968
IO	0.017	0.173	98.477	0.00000	0.10	0.708	1.278
RITE	0.016	0.156	98.633	0.00000	0.03	0.615	0.978
MIXMIX	0.015	0.154	98.787	6.50641	0.00	0.788	1.365
REED	0.011	0.106	98.893	0.00000	0.01	0.732	1.052
YOREAD	0.010	0.103	98.995	58.90635	0.00	1.292	1.175
PARAM	0.008	0.080	99.075	99.14908	0.00	0.398	0.381
KEDIT	0.008	0.080	99.155	83.49833	0.00	0.631	0.780
CLEAR	0.007	0.072	99.227	0.00000	0.02	0.135	0.054
FREAK	0.007	0.069	99.296	55.29735	0.00	0.843	0.864
STATIS	0.007	0.068	99.364	0.00000	0.01	1.883	0.107
GUIDE	0.006	0.063	99.427	24.48315	0.00	1.115	1.120
NSUPG	0.006	0.060	99.487	96.88834	0.00	0.753	0.356
FHLPR	0.004	0.044	99.531	99.23509	0.00	0.847	0.644
EDITOR	0.004	0.036	99.567	74.06324	0.00	1.563	0.833
OPNFIL	0.003	0.035	99.601	94.47676	0.00	0.777	0.662
AREAD	0.003	0.032	99.633	100.00000	0.07	1.155	0.641
JSTIME	0.003	0.029	99.662	0.00000	0.77	2.299	1.600
DREAD	0.002	0.022	99.683	0.00000	0.00	1.225	0.264
CHKSTR	0.002	0.020	99.704	0.00000	0.00	1.086	1.035
LISTQA	0.002	0.019	99.723	100.00000	0.00	0.498	0.277
DATAIN	0.002	0.018	99.741	98.72408	0.00	1.191	0.503
IOWRT	0.002	0.018	99.759	100.00000	0.00	0.891	0.687
KENOVA	0.002	0.016	99.775	98.35119	0.00	0.721	0.335
LOOPER	0.002	0.016	99.791	1.18765	0.06	1.141	1.199
VOLUME	0.001	0.014	99.805	85.52322	0.00	0.305	0.736
INITAL	0.001	0.014	99.818	89.24789	0.00	0.588	0.911
RD	0.001	0.011	99.830	0.00000	0.00	1.146	1.089
NSTART	0.001	0.010	99.840	1.78784	0.09	1.609	1.404
PRTPLT	0.001	0.010	99.850	89.05987	0.00	0.438	0.666
PRTJOM	0.001	0.009	99.860	82.75031	0.00	0.374	0.753
IOSDUN	0.001	0.008	99.868	100.00000	0.00	0.914	0.890
LIMLN	0.001	0.008	99.876	89.76646	0.00	1.349	0.421
INQUIR	0.001	0.008	99.884	0.00000	0.01	1.304	0.963
PRANG	0.001	0.008	99.891	33.14452	0.00	0.670	1.591
RDPLT	0.001	0.007	99.898	15.95748	0.00	1.191	0.528
KENOG	0.001	0.006	99.905	10.06712	0.00	0.980	1.181
READGM	0.001	0.006	99.911	0.00000	0.00	0.757	0.996
MASTER	0.001	0.006	99.917	90.40857	0.00	1.580	0.659
LODWTS	0.001	0.006	99.924	98.56588	0.00	0.347	0.340
PRTMIX	0.001	0.006	99.930	92.25707	0.00	0.728	0.776
RCHRS	0.001	0.006	99.935	100.00000	0.00	2.385	1.659
DATIM	0.001	0.006	99.941	0.00000	0.00	0.867	0.832
MAKTAP	0.000	0.004	99.945	5.15464	0.00	0.474	1.137
MIX2D	0.000	0.004	99.949	4.96689	0.00	1.408	0.849
MIXIT	0.000	0.004	99.953	27.77781	0.00	1.742	1.246
CLOSDA	0.000	0.003	99.956	0.00000	0.00	1.306	1.019

PULL	0.000	0.003	99.959	0.00000	1.38	11.252	0.780
CLSCR	0.000	0.002	99.961	97.86480	0.00	0.839	0.811
RELATE	0.000	0.002	99.963	95.45462	0.00	0.316	0.878
MIX1D	0.000	0.002	99.965	4.43038	0.00	0.964	0.131
RDTAPE	0.000	0.002	99.967	86.20690	0.00	1.444	1.210
CMPRS	0.000	0.002	99.969	0.00000	0.00	1.041	0.910
ANGLES	0.000	0.002	99.971	0.00000	0.14	0.682	1.483
RDMIXT	0.000	0.002	99.973	0.00000	0.00	1.480	1.213
MIXER	0.000	0.002	99.975	45.45457	0.00	1.064	1.124
MGCWRD	0.000	0.002	99.977	0.00000	0.12	6.654	0.916
ICEMIX	0.000	0.002	99.978	9.31678	0.00	1.194	1.176
MESSAGE	0.000	0.002	99.980	100.00000	0.00	1.433	1.189
IOLEFT	0.000	0.002	99.981	0.00000	0.70	10.060	0.738
RSTPTR	0.000	0.001	99.982	0.00000	0.23	4.578	0.491
LEGEND	0.000	0.001	99.983	0.00000	0.25	2.642	1.563
GETPTR	0.000	0.001	99.984	0.00000	0.24	5.064	0.519
GEOMIN	0.000	0.001	99.986	100.00000	0.00	2.032	1.134
FREAD	0.000	0.001	99.986	100.00000	0.04	1.594	1.130
GETMUS	0.000	0.001	99.987	0.00000	0.32	5.556	0.669
FILLSG	0.000	0.001	99.988	20.54795	0.00	2.436	1.232
WATES	0.000	0.001	99.989	0.00000	0.00	0.825	0.496
FLDATA	0.000	0.001	99.990	94.93672	0.00	1.531	0.870
VOLFIS	0.000	0.001	99.990	69.01412	0.00	0.567	0.836
IREAD	0.000	0.001	99.991	0.00000	0.03	1.774	1.137
NORM2D	0.000	0.001	99.992	32.75862	0.00	0.894	0.130
SUMSCT	0.000	0.001	99.992	88.97243	0.00	0.113	0.083
FIL2D	0.000	0.001	99.993	33.52941	0.00	1.486	0.350
JOMITY	0.000	0.001	99.993	100.00000	0.00	0.818	0.958
SORTA	0.000	0.000	99.994	90.80460	0.00	1.349	1.005
XSEC1D	0.000	0.000	99.994	88.88889	0.00	0.362	0.172
RTADJ	0.000	0.000	99.995	0.00000	0.00	0.024	1.088
XXIN	0.000	0.000	99.995	0.00000	0.00	0.693	1.425
JOMCHK	0.000	0.000	99.995	71.42861	0.00	0.498	1.147
MAKANG	0.000	0.000	99.996	12.60504	0.00	0.702	0.791
DTASET	0.000	0.000	99.996	0.00000	0.02	0.994	0.978
NNITL	0.000	0.000	99.996	0.00000	0.00	1.217	1.604
POINT	0.000	0.000	99.997	0.00000	0.00	1.919	0.702
WRTPLT	0.000	0.000	99.997	0.00000	0.00	1.108	1.409
SCOOT	0.000	0.000	99.997	98.36066	0.00	0.111	0.170
HUNTER	0.000	0.000	99.997	100.00000	0.00	0.411	1.144
XXLIM	0.000	0.000	99.998	0.00000	0.01	0.528	1.418
RT	0.000	0.000	99.998	0.00000	0.00	4.096	1.235
RGUSED	0.000	0.000	99.998	100.00000	0.00	1.709	1.062
RCRDLN	0.000	0.000	99.998	0.00000	0.02	5.889	1.136
LOADIT	0.000	0.000	99.998	100.00000	0.00	1.312	1.037
RDORGN	0.000	0.000	99.998	0.00000	0.00	1.103	1.453
NORM1D	0.000	0.000	99.999	86.13861	0.00	1.008	0.397
RNDOUT	0.000	0.000	99.999	88.23532	0.00	1.013	1.235
LREAD	0.000	0.000	99.999	0.00000	0.01	14.812	1.020
HOLE	0.000	0.000	99.999	0.00000	0.00	2.569	0.957
ALOCAT	0.000	0.000	99.999	100.00000	0.00	1.889	0.831
SORTR	0.000	0.000	99.999	0.00000	0.00	2.284	0.956
JLL2	0.000	0.000	99.999	0.00000	0.00	3.000	0.300
JSZERO	0.000	0.000	99.999	78.94737	0.00	2.965	1.042

CORSIZ	0.000	0.000	99.999	0.00000	0.00	1.777	0.959
MIXCRS	0.000	0.000	100.000	0.00000	0.00	3.056	0.637
SGWT	0.000	0.000	100.000	0.00000	0.00	2.200	1.093
XLNTHS	0.000	0.000	100.000	0.00000	0.00	1.870	0.782
UNTCRS	0.000	0.000	100.000	0.00000	0.00	0.827	1.163
FINDQA	0.000	0.000	100.000	0.00000	0.00	1.107	0.873
GTVOLS	0.000	0.000	100.000	66.66667	0.00	0.190	0.733
BOXC	0.000	0.000	100.000	0.00000	0.00	0.786	1.163
FLTOUT	0.000	0.000	100.000	0.00000	0.01	1.350	0.636
PRTXS	0.000	0.000	100.000	0.00000	0.00	0.154	0.997
LODRGC	0.000	0.000	100.000	0.00000	0.00	1.235	0.414
TIMFAC	0.000	0.000	100.000	0.00000	0.01	12.000	0.655
FREECR	0.000	0.000	100.000	0.00000	0.01	0.000	0.671
SCANON	0.000	0.000	100.000	0.00000	0.01	5.000	0.865

=====

Totals (All Traced Routines)

	9.948	100.000	100.000	3.35296	774.97	1.564	1.140
--	-------	---------	---------	---------	--------	-------	-------

Key:

%AccumT = accumulated percentage of total CPU time  
 %ExTime = percentage of total CPU time  
 %Vflops = percentage of floating point operations due  
           to vector floating point operations  
 IBFR = Instruction Buffer Fetch Rate (megafetches/sec)  
 IFact = Inline Factor (total calls to routine /  
           average time spent in routine for each call)  
 MC = number of memory conflicts  
 MR = number of memory references  
 Time = total CPU time (sec)

## 9. Coverage Analysis

A coverage analysis shows that the sample problem yielded a 29% segment coverage of KENO5A. Sample problems provided with simulation programs typically achieve only 35% to 50% coverage. A statement of software quality cannot be made for routines that have low coverage, i.e., large portions of the code are untested.

Note that 95 routines have 0% coverage. These routines are not tested with the supplied sample problem.

Twelve routines achieve 1%-19% coverage, 9 routines achieve 20%-39% coverage, 22 routines achieve 40%-59% coverage, 31 routines achieve 60%-79% coverage, 22 routines achieve 80%-99% coverage, and 30 routines achieve 100% coverage.

Module Name	Number of Segments in module	Number of Segments Executed	Percent Segment Coverage
KENOVA	4	3	75.0
ADJUST	28	0	0.0
ALBedo	30	0	0.0
ALBRD	31	0	0.0
ALBUSE	22	0	0.0
ALOCAT	1	1	100.0
ANGLES	47	5	10.6

ARALBA	6	0	0.0
ARASIZ	126	0	0.0
ARAYIN	81	0	0.0
AREAD	54	45	83.3
AZIRN	1	1	100.0
BADMOM	22	0	0.0
BANKER	25	16	64.0
BOX	1	0	0.0
BOXC	7	6	85.7
CHKSTR	12	8	66.7
CHOOSE	6	0	0.0
CLEAR	5	5	100.0
CLSCR	4	2	50.0
CMPRS	24	22	91.7
CORRE	9	0	0.0
CORSIZ	55	6	10.9
CREAD	3	0	0.0
CRMAX	65	0	0.0
CRMIN	110	0	0.0
CROS	331	64	19.3
CRSPRD	1	0	0.0
DATAIN	126	62	49.2
DATIM	1	1	100.0
DIFALB	1	0	0.0
DOTPRD	3	0	0.0
DREAD	114	69	60.5
DTASET	1	1	100.0
EDITOR	39	27	69.2
ENFILE	1	0	0.0
ERRTRA	1	0	0.0
EXPRN	1	1	100.0
EXTRA	1	0	0.0
EYENIT	1	0	0.0
FHLPR	9	8	88.9
FIL2D	33	24	72.7
FILLSG	60	34	56.7
FIND	22	0	0.0
FINDBX	22	0	0.0
FINDQA	1	1	100.0
FISFLX	56	13	23.2
FITFLX	46	0	0.0
FLDATA	52	28	53.8
FLTIN	1	0	0.0
FLTOUT	1	1	100.0
FLTRN	7	6	85.7
FREAD	1	1	100.0
FREAK	62	54	87.1
FREECR	1	1	100.0
GEOMIN	3	2	66.7
GETMUS	38	2	5.3
GOCURS	10	0	0.0
GTISO	1	1	100.0
GTVOLS	9	7	77.8
GUIDE	89	46	51.7

HLFWRD	3	0	0.0
HOLCHK	13	0	0.0
HOLE	29	14	48.3
HOLEXT	60	0	0.0
HOLHOL	139	0	0.0
HUNTER	18	12	66.7
ICEMIX	20	11	55.0
ICOMPA	7	0	0.0
IDX1D	9	0	0.0
INDX	6	0	0.0
INITAL	27	21	77.8
IO	10	7	70.0
IOLEFT	1	1	100.0
IOSDUN	1	1	100.0
IOWRT	5	4	80.0
IREAD	1	1	100.0
IXALB	5	0	0.0
JLL2	8	7	87.5
JOBNUM	1	0	0.0
JOMCHK	90	18	20.0
JOMITY	5	4	80.0
JSTIME	3	2	66.7
JSZERO	1	1	100.0
KEDIT	68	40	58.8
KENOG	188	32	17.0
LABL	25	0	0.0
LDWRT	3	0	0.0
LEGEND	14	2	14.3
LIMLN	19	15	78.9
LISTQA	1	1	100.0
LOADIT	8	4	50.0
LOCATE	30	9	30.0
LOCBOX	1	0	0.0
LODALB	7	0	0.0
LODARA	34	0	0.0
LODRGC	3	3	100.0
LODWTS	38	9	23.7
LOOPER	7	5	71.4
LREAD	3	2	66.7
LSCAN	10	0	0.0
MAKANG	23	15	65.2
MAKTAP	26	21	80.8
MASTER	53	37	69.8
MATK	55	0	0.0
MATRIX	110	0	0.0
MESAGE	1	1	100.0
MESH	19	12	63.2
MGCWRD	5	3	60.0
MIX1D	51	43	84.3
MIX2D	22	14	63.6
MIX2M	3	0	0.0
MIXCRS	8	7	87.5
MIXER	16	8	50.0
MIXIT	25	18	72.0



MIXMIX	83	55	66.3
MOVE	3	3	100.0
NNITL	5	5	100.0
NORM1D	23	17	73.9
NORM2D	12	10	83.3
NSTART	8	4	50.0
NSUPG	88	55	62.5
OPENDA	23	21	91.3
OPNFIL	1	1	100.0
PARAM	243	98	40.3
PLTKEF	34	34	100.0
POINT	20	10	50.0
POSIT	108	13	12.0
PRANG	23	19	82.6
PRINT	18	14	77.8
PRT1D	30	0	0.0
PRT1DS	3	0	0.0
PRT2DS	27	0	0.0
PRTARA	9	0	0.0
PRTFLX	8	0	0.0
PRTJOM	90	40	44.4
PRTLBA	44	0	0.0
PRTMIX	1	1	100.0
PRTPLT	19	11	57.9
PRTWTS	39	0	0.0
PRTXS	28	2	7.1
PULL	1	1	100.0
Q	8	0	0.0
RATIO	20	0	0.0
RCHRS	8	6	75.0
RDALB	12	0	0.0
RDARA	9	0	0.0
RDBIAS	47	0	0.0
RDBOX	94	0	0.0
RDCALC	71	0	0.0
RDGRP	11	0	0.0
RDICE	17	0	0.0
RDMIXT	3	3	100.0
RDORGN	12	5	41.7
RDPLT	132	71	53.8
RDREF	42	0	0.0
RDRST	86	0	0.0
RDSTRT	48	0	0.0
RDTAPE	90	53	58.9
RDWTS	5	0	0.0
READGM	53	29	54.7
RELATE	19	18	94.7
RESET	29	11	37.9
RGUSED	26	8	30.8
RNDIN	1	0	0.0
RNDOUT	1	1	100.0
RT	1	1	100.0
RTADJ	7	6	85.7
RTARA	10	0	0.0

SAVST6	9	0	0.0
SCANON	14	4	28.6
SCOOT	9	8	88.9
SFLRA	1	0	0.0
SGALB	9	0	0.0
SGWT	3	3	100.0
SORTA	101	27	26.7
SORTBK	19	18	94.7
SORTR	18	13	72.2
SRMAX	52	0	0.0
SRMIN	79	0	0.0
START	148	55	37.2
START0	1	0	0.0
START1	1	0	0.0
START2	9	0	0.0
START3	1	0	0.0
START4	1	0	0.0
START5	3	0	0.0
START6	23	0	0.0
STATIS	27	15	55.6
STOP	1	0	0.0
STRTSU	42	5	11.9
SUMSCT	10	9	90.0
TIMER	1	1	100.0
TIMFAC	1	1	100.0
TRACK	525	121	23.0
TRKWRT	5	0	0.0
UNTCRS	6	5	83.3
VECADD	3	0	0.0
VECDIF	3	0	0.0
VECNRM	3	0	0.0
VOLFIS	25	18	72.0
VOLUME	124	71	57.3
WAITIN	15	0	0.0
WATES	53	9	17.0
WRTALB	9	0	0.0
WRTARA	9	0	0.0
WRTCAL	17	0	0.0
WRTGRP	5	0	0.0
WRTICE	16	0	0.0
WRTPLT	5	4	80.0
WRTNST	80	0	0.0
WRTWTS	5	0	0.0
XLNTHS	7	6	85.7
XRMIN	89	0	0.0
XSEC1D	37	31	83.8
XXIN	13	11	84.6
XXLIM	46	5	10.9
XXMIN	120	0	0.0
YOREAD	11	8	72.7
YREAD	80	0	0.0
ZREAD	63	0	0.0
Totals	7073	2053	29.0

	0.20	0.40	0.60	0.80	1.00
KENOVA	*****				
ADJUST					
ALBedo					
ALBRD					
ALBUSE					
ALOCAT	*****				
ANGLES	*****				
ARALBA					
ARASIZ					
ARAYIN					
AREAD	*****				
AZIRN	*****				
BADMOM					
BANKER	*****				
BOX					
BOXC	*****				
CHKSTR	*****				
CHOOSE					
CLEAR	*****				
CLSCR	*****				
CMPRS	*****				
CORRE					
CORSIZ	*****				
CREAD					
CRMAX					
CRMIN					
CROS	*****				
CRSPRD					
DATAIN	*****				
DATIM	*****				
DIFALB					
DOTPRD					
DREAD	*****				
DTASET	*****				
EDITOR	*****				
ENFILE					
ERRTRA					
EXPRN	*****				
EXTRA					
EYENIT					
FHLPR	*****				
FIL2D	*****				
FILLSG	*****				
FIND					
FINDBX					
FINDQA	*****				
FISFLX	*****				
FITFLX					
FLDATA	*****				

FLTIN	*****
FLTOUT	*****
FLTRN	*****
FREAD	*****
FREAK	*****
FREECR	*****
GEOMIN	*****
GETMUS	***
GOCURS	
GTISO	*****
GTVOLS	*****
GUIDE	*****
HLFWRD	
HOLCHK	
HOLE	*****
HOLEXT	
HOLHOL	
HUNTER	*****
ICEMIX	*****
ICOMPA	
IDX1D	
INDX	
INITAL	*****
IO	*****
IOLEFT	*****
IOSDUN	*****
IOWRT	*****
IREAD	*****
IXALB	
JLL2	*****
JOBNUM	
JOMCHK	*****
JOMITY	*****
JSTIME	*****
JSZERO	*****
KEDIT	*****
KENOG	*****
LABL	
LDWRT	
LEGEND	*****
LIMLN	*****
LISTQA	*****
LOADIT	*****
LOCATE	*****
LOCBOX	
LODALB	
LODARA	
LODRGC	*****
LODWTS	*****
LOOPER	*****
LREAD	*****
LSCAN	
MAKANG	*****
MAKTAP	*****

MASTER	*****				
MATK					
MATRIX					
MESAGE	*****				
MESH	*****				
MGCWRD	*****				
MIX1D	*****				
MIX2D	*****				
MIX2M					
MIXCRS	*****				
MIXER	*****				
MIXIT	*****				
MIXMIX	*****				
MOVE	*****				
NNITL	*****				
NORM1D	*****				
NORM2D	*****				
NSTART	*****				
NSUPG	*****				
OPENDA	*****				
OPNFIL	*****				
PARAM	*****				
PLTKEF	*****				
POINT	*****				
POSIT	*****				
PRANG	*****				
PRINT	*****				
PRT1D					
PRT1DS					
PRT2DS					
PRTARA					
PRTFLX					
PRTJOM	*****				
PRTLBA					
PRTMIX	*****				
PRTPLT	*****				
PRTWTS					
PRTXS	****				
PULL	*****				
Q					
RATIO					
RCHRS	*****				
RDALB					
RDARA					
RDBIAS					
RDBOX					
RDCALC					
RDGRP					
RDICE					
RDMIXT	*****				
RDORGN	*****				
RDPLOT	*****				
RDREF					
RDRST					

RDSTRT	*****			
RDTAPE	*****			
RDWTS	*****			
READGM	*****			
RELATE	*****			
RESET	*****			
RGUSED	*****			
RNDIN	*****			
RNDOUT	*****			
RT	*****			
RTADJ	*****			
RTARA				
SAVST6				
SCANON	*****			
SCOOT	*****			
SFLRA				
SGALB				
SGWT	*****			
SORTA	*****			
SORTBK	*****			
SORTR	*****			
SRMAX				
SRMIN				
START	*****			
START0				
START1				
START2				
START3				
START4				
START5				
START6				
STATIS	*****			
STOP				
STRTSU	*****			
SUMSCT	*****			
TIMER	*****			
TIMFAC	*****			
TRACK	*****			
TRKWRT				
UNTCRS	*****			
VECADD				
VECDIF				
VECNRM				
VOLFIS	*****			
VOLUME	*****			
WAITIN				
WATES	*****			
WRTALB				
WRTARA				
WRTCAL				
WRTGRP				
WRTICE				
WRTPLT	*****			
WRTRST				

WRTWTS	*****	*****	*****	*****
XLNTHS	*****	*****	*****	*****
XRMIN	*****	*****	*****	*****
XSEC1D	*****	*****	*****	*****
XXIN	*****	*****	*****	*****
XXLIM	*****	*****	*****	*****
XXMIN	*****	*****	*****	*****
YOREAD	*****	*****	*****	*****
YREAD	*****	*****	*****	*****
ZREAD	*****	*****	*****	*****

coverage = 0.

ADJUST	ALBEdo	ALBRD	ALBUSE	ARALBA
ARASIZ	ARAYIN	BADMOM	BOX	CHOOSE
CORRE	CREAD	CRMAX	CRMIN	CRSPRD
DIFALB	DOTPRD	ENFILE	ERRTRA	EXTRA
EYENIT	FIND	FINDBX	FITFLX	FLTIN
GOCURS	HLFWRD	HOLCHK	HOLEXT	HOLHOL
ICOMPA	IDX1D	INDX	IXALB	JOBNUM
LABL	LDWRT	LOCBOX	LODALB	LODARA
LSCAN	MATK	MATRIX	MIX2M	PRT1D
PRT1DS	PRT2DS	PRTARA	PRTFLX	PRTLBA
PRTWTS	Q	RATIO	RDALB	RDARA
RDBIAS	RDBOX	RDCALC	RDGRP	RDICE
RDREF	RDRST	RDSTRT	RDWTS	RNDIN
RTARA	SAVST6	SFLRA	SGALB	SRMAX
SRMIN	START0	START1	START2	START3
START4	START5	START6	STOP	TRKWRT
VECADD	VECDIF	VECNRM	WAITIN	WRTALB
WRTARA	WRTCAL	WRTGRP	WRTICE	WTRST
WRTWTS	XRMIN	XXMIN	YREAD	ZREAD

0.01 &lt;= coverage &lt; 0.20

ANGLES	CORSIZ	CROS	GETMUS	JOMCHK
KENOG	LEGEND	POSIT	PRTXS	STRTSU
WATES	XXLIM			

0.20 &lt;= coverage &lt; 0.40

FISFLX	LOCATE	LODWTS	RESET	RGUSED
SCANON	SORTA	START	TRACK	

0.40 &lt;= coverage &lt; 0.60

CLSCR	DATAIN	FILLSG	FLDATA	GUIDE
HOLE	ICEMIX	KEDIT	LOADIT	MGCWRD
MIXER	NSTART	PARAM	POINT	PRTJOM
PRTPLT	RDORGN	RDPLT	RTAPE	READGM
STATIS	VOLUME			

0.60 &lt;= coverage &lt; 0.80

KENOVA	BANKER	CHKSTR	DREAD	EDITOR
FIL2D	GEOMIN	GTVOLS	HUNTER	INITAL
IO	IOWRT	JOMITY	JSTIME	LIMLN
LOOPER	LREAD	MAKANG	MASTER	MESH
MIX2D	MIXIT	MIXMIX	NORM1D	NSUPG
PRINT	RCHRS	SORTR	VOLFIS	WRTPLT

	YOREAD				
0.80 <= coverage < 0.85	AREAD UNTCRS	MAKTAP XSEC1D	MIX1D XXIN	NORM2D	PRANG
0.85 <= coverage < 0.90	BOXC MIXCRS	FHLPR RTADJ	FLTRN SCOOT	FREAK XLNTHS	JLL2
0.90 <= coverage < 0.95	CMPRS	OPENDA	RELATE	SORTBK	SUMSCT
coverage = 1.00	ALOCAT EXPRN GTISO LISTQA OPNFIL RNDOUT	AZIRN FINDQA IOLEFT LODRGC PLTKEF RT	CLEAR FLTOUT IOSDUN MESSAGE PRTMIX SGWT	DATIM FREAD IREAD MOVE PULL TIMER	DTASET FREECR JSZERO NNITL RDMIXT TIMFAC

Program coverage for this run =0.29

## 10. Complexity Analysis

Some key metrics are the number of executable statements (sloc), the number of non-blank comments (ncomt), McCabe's extended cyclomatic complexity (vg2), the number of branching statements (cgoto, ugoto, bIF, and lIF), and Halstead's predicted number of errors in (re)writing the code (bhat). Measures are normalized per 100 executable statements for ease of comparison and are listed in the table below.

The branching measures for this code (ugoto/sloc, lif/sloc) indicate high values for several routines. This code may benefit from a restructuring effort aimed at reducing the number of unconditional GO TO and logical IF statements in such routines.

Most routines show a poor ratio of non-blank comments to source code. This code may benefit from more internal documentation.

M McCabe's extended cyclomatic complexity (vg2), normalized per 100 lines of source code, indicates high values. Generally, the routines with the highest complexity are those most likely to have defects. As a guideline, normalized measures of 15 or greater should be considered complex. A software maintenance program should focus on those routines with the highest measures.



## Complexity Report by Subprogram for KENOVA

Name	loc	sloc	cmnt	ncomt	ncomt /sloc	vg2 /sloc	cgoto	cgoto /sloc	ugoto	ugoto /sloc	bIF	bif /sloc	lIF	lif /sloc	Bhat
KENOVA	81	33	19	13	39.4	6.1	0	0.0	1	3.0	0	0.0	1	3.0	0
ADJUST	45	39	3	3	7.7	12.8	1	2.6	1	2.6	0	0.0	1	2.6	1
ALBedo	111	70	15	14	20.0	20.0	0	0.0	7	10.0	0	0.0	8	11.4	1
ALBRD	77	42	1	1	2.4	35.7	0	0.0	6	14.3	0	0.0	7	16.7	1
ALBUSE	55	43	0	0	0.0	20.9	1	2.3	5	11.6	0	0.0	2	4.7	1
ALOCAT	6	4	0	0	0.0	25.0	0	0.0	0	0.0	0	0.0	0	0.0	0
ANGLES	97	93	0	0	0.0	21.5	0	0.0	8	8.6	0	0.0	11	11.8	0
ARALBA	14	8	0	0	0.0	37.5	0	0.0	1	12.5	0	0.0	1	12.5	0
ARASIZ	260	215	0	0	0.0	40.0	0	0.0	17	7.9	10	4.7	30	14.0	2
ARAYIN	178	130	0	0	0.0	25.4	2	1.5	23	17.7	1	0.8	22	16.9	2
AREAD	97	95	0	0	0.0	33.7	0	0.0	9	9.5	8	8.4	15	15.8	1
AZIRN	7	5	0	0	0.0	20.0	0	0.0	0	0.0	0	0.0	0	0.0	0
BADMOM	67	49	0	0	0.0	22.4	0	0.0	1	2.0	0	0.0	1	2.0	0
BANKER	40	42	3	1	2.4	26.2	0	0.0	8	19.0	0	0.0	9	21.4	0
BOX	25	6	0	0	0.0	16.7	0	0.0	0	0.0	0	0.0	0	0.0	0
BOXC	25	11	0	0	0.0	45.5	0	0.0	1	9.1	0	0.0	1	9.1	0
CHKSTR	72	27	0	0	0.0	22.2	0	0.0	1	3.7	0	0.0	4	14.8	0
CHOOSE	22	10	0	0	0.0	30.0	0	0.0	1	10.0	0	0.0	2	20.0	0
CLEAR	8	7	0	0	0.0	42.9	0	0.0	0	0.0	0	0.0	1	14.3	0
CLSCR	15	7	6	2	28.6	28.6	0	0.0	1	14.3	0	0.0	1	14.3	0
CMPRS	49	52	0	0	0.0	25.0	0	0.0	4	7.7	0	0.0	6	11.5	0
CORRE	86	30	0	0	0.0	16.7	0	0.0	0	0.0	0	0.0	2	6.7	1
CORSIZ	114	65	0	0	0.0	30.8	1	1.5	10	15.4	0	0.0	10	15.4	1
CREAD	10	8	0	0	0.0	25.0	0	0.0	0	0.0	0	0.0	1	12.5	0
CRMAX	121	126	0	0	0.0	16.7	1	0.8	9	7.1	0	0.0	13	10.3	1
CRMIN	206	213	0	0	0.0	23.0	1	0.5	6	2.8	18	8.5	15	7.0	4
CROS	525	591	0	0	0.0	29.8	6	1.0	106	17.9	8	1.4	93	15.7	8
CRSPRD	7	5	0	0	0.0	20.0	0	0.0	0	0.0	0	0.0	0	0.0	0
DATAIN	380	263	0	0	0.0	25.9	1	0.4	36	13.7	1	0.4	41	15.6	1
DATIM	11	4	5	3	75.0	25.0	0	0.0	0	0.0	0	0.0	0	0.0	0
DIFALB	21	11	0	0	0.0	9.1	0	0.0	0	0.0	0	0.0	0	0.0	0
DOTPRD	8	6	0	0	0.0	33.3	0	0.0	0	0.0	0	0.0	0	0.0	0
DREAD	179	179	0	0	0.0	21.8	1	0.6	20	11.2	10	5.6	23	12.8	1
DTASET	7	4	0	0	0.0	25.0	0	0.0	0	0.0	0	0.0	0	0.0	0
EDITOR	119	63	0	0	0.0	31.7	0	0.0	5	7.9	0	0.0	14	22.2	0
ENFILE	8	4	0	0	0.0	25.0	0	0.0	0	0.0	0	0.0	0	0.0	0

## KENO5A Analysis

June 7, 1994

ERRTRA	3	2	0	0	0.0	50.0	0	0.0	0	0.0	0	0.0	0	0.0	0
EXPRN	4	3	0	0	0.0	33.3	0	0.0	0	0.0	0	0.0	0	0.0	0
EXTRA	4	2	0	0	0.0	50.0	0	0.0	0	0.0	0	0.0	0	0.0	0
EYENIT	3	2	0	0	0.0	50.0	0	0.0	0	0.0	0	0.0	0	0.0	0
FHLPR	21	13	0	0	0.0	30.8	0	0.0	1	7.7	0	0.0	1	7.7	0
FIL2D	94	51	0	0	0.0	35.3	0	0.0	1	2.0	3	5.9	6	11.8	1
FILLSG	196	123	6	4	3.3	24.4	0	0.0	2	1.6	1	0.8	24	19.5	2
FIND	49	44	0	0	0.0	20.5	0	0.0	6	13.6	0	0.0	5	11.4	1
FINDBX	75	46	0	0	0.0	30.4	0	0.0	5	10.9	0	0.0	5	10.9	1
FINDQA	8	5	0	0	0.0	20.0	0	0.0	0	0.0	0	0.0	0	0.0	0
FISFLX	173	119	0	0	0.0	26.9	0	0.0	5	4.2	12	10.1	7	5.9	1
FITFLX	137	88	0	0	0.0	23.9	0	0.0	8	9.1	1	1.1	12	13.6	1
FLDATA	189	118	0	0	0.0	25.4	0	0.0	3	2.5	1	0.8	22	18.6	2
FLTIN	5	3	0	0	0.0	33.3	0	0.0	0	0.0	0	0.0	0	0.0	0
FLTOUT	5	3	0	0	0.0	33.3	0	0.0	0	0.0	0	0.0	0	0.0	0
FLTRN	77	26	43	15	57.7	23.1	0	0.0	0	0.0	2	7.7	0	0.0	0
FREAD	5	3	3	1	33.3	33.3	0	0.0	0	0.0	0	0.0	0	0.0	0
FREAK	94	82	0	0	0.0	30.5	0	0.0	7	8.5	0	0.0	13	15.9	0
FREECR	3	2	0	0	0.0	50.0	0	0.0	0	0.0	0	0.0	0	0.0	0
GEOMIN	53	27	0	0	0.0	7.4	0	0.0	0	0.0	0	0.0	1	3.7	0
GETMUS	92	89	0	0	0.0	19.1	0	0.0	8	9.0	0	0.0	9	10.1	1
GOCURS	23	12	0	0	0.0	41.7	0	0.0	1	8.3	0	0.0	1	8.3	0
GTISO	8	7	0	0	0.0	14.3	0	0.0	0	0.0	0	0.0	0	0.0	0
GTVOLS	17	15	0	0	0.0	33.3	0	0.0	2	13.3	0	0.0	2	13.3	0
GUIDE	377	247	0	0	0.0	19.0	0	0.0	11	4.5	8	3.2	29	11.7	3
HLFWRD	7	4	0	0	0.0	50.0	0	0.0	0	0.0	0	0.0	0	0.0	0
HOLCHK	62	32	0	0	0.0	18.8	0	0.0	1	3.1	1	3.1	2	6.3	0
HOLE	52	48	0	0	0.0	27.1	0	0.0	5	10.4	0	0.0	8	16.7	0
HOLEXT	94	82	0	0	0.0	28.0	1	1.2	21	25.6	0	0.0	14	17.1	1
HOLHOL	154	153	0	0	0.0	28.8	3	2.0	38	24.8	1	0.7	33	21.6	3
HUNTER	41	33	0	0	0.0	24.2	0	0.0	4	12.1	0	0.0	4	12.1	0
ICEMIX	112	36	0	0	0.0	36.1	0	0.0	3	8.3	0	0.0	8	22.2	0
ICOMPA	11	11	0	0	0.0	36.4	0	0.0	0	0.0	0	0.0	2	18.2	0
IDX1D	41	14	0	0	0.0	35.7	0	0.0	0	0.0	0	0.0	2	14.3	0
INDX	17	9	0	0	0.0	33.3	0	0.0	1	11.1	0	0.0	1	11.1	0
INITAL	127	63	6	5	7.9	27.0	0	0.0	0	0.0	5	7.9	6	9.5	0
IO	17	15	0	0	0.0	20.0	1	6.7	0	0.0	0	0.0	0	0.0	0
IOLEFT	4	3	0	0	0.0	33.3	0	0.0	0	0.0	0	0.0	0	0.0	0
IOSDUN	13	7	0	0	0.0	14.3	0	0.0	0	0.0	0	0.0	0	0.0	0
IOWRT	14	9	0	0	0.0	33.3	0	0.0	0	0.0	0	0.0	2	22.2	0
IREAD	5	3	0	0	0.0	33.3	0	0.0	0	0.0	0	0.0	0	0.0	0
IXALB	12	11	0	0	0.0	27.3	0	0.0	0	0.0	0	0.0	1	9.1	0

## KENO5A Analysis

June 7, 1994

JLL2	16	15	0	0	0.0	40.0	0	0.0	0	0.0	0	0.0	2	13.3	0
JOBNUM	5	3	0	0	0.0	33.3	0	0.0	0	0.0	0	0.0	0	0.0	0
JOMCHK	195	136	0	0	0.0	30.9	1	0.7	31	22.8	0	0.0	25	18.4	1
JOMITY	86	11	0	0	0.0	36.4	0	0.0	0	0.0	0	0.0	2	18.2	1
JSTIME	14	10	2	2	20.0	20.0	0	0.0	0	0.0	0	0.0	1	10.0	0
JSZERO	9	5	2	2	40.0	20.0	0	0.0	0	0.0	0	0.0	0	0.0	0
KEDIT	268	151	9	7	4.6	22.5	0	0.0	11	7.3	1	0.7	20	13.2	1
KENOG	376	338	0	0	0.0	33.7	7	2.1	15	4.4	6	1.8	57	16.9	6
LABL	37	36	0	0	0.0	30.6	1	2.8	4	11.1	0	0.0	6	16.7	1
LDWRT	37	17	0	0	0.0	11.8	0	0.0	0	0.0	0	0.0	0	0.0	0
LEGEND	38	31	0	0	0.0	25.8	0	0.0	0	0.0	0	0.0	2	6.5	0
LIMLN	110	57	0	0	0.0	15.8	0	0.0	2	3.5	0	0.0	4	7.0	1
LISTQA	27	5	1	1	20.0	20.0	0	0.0	0	0.0	0	0.0	0	0.0	0
LOADIT	56	19	0	0	0.0	31.6	0	0.0	0	0.0	3	15.8	1	5.3	0
LOCATE	116	63	0	0	0.0	25.4	0	0.0	4	6.3	3	4.8	9	14.3	1
LOCBOX	19	3	0	0	0.0	33.3	0	0.0	0	0.0	0	0.0	0	0.0	0
LODALB	19	13	0	0	0.0	30.8	0	0.0	0	0.0	0	0.0	1	7.7	0
LODARA	104	71	0	0	0.0	28.2	0	0.0	6	8.5	1	1.4	9	12.7	1
LODRGC	8	6	0	0	0.0	33.3	0	0.0	0	0.0	0	0.0	0	0.0	0
LODWTS	97	71	0	0	0.0	25.4	0	0.0	7	9.9	0	0.0	11	15.5	0
LOOPER	62	21	0	0	0.0	19.0	0	0.0	0	0.0	0	0.0	2	9.5	0
LREAD	20	6	0	0	0.0	50.0	0	0.0	0	0.0	0	0.0	1	16.7	0
LSCAN	16	13	0	0	0.0	38.5	0	0.0	0	0.0	1	7.7	0	0.0	0
MAKANG	54	49	0	0	0.0	18.4	0	0.0	7	14.3	0	0.0	5	10.2	0
MAKTAP	61	53	0	0	0.0	22.6	0	0.0	4	7.5	0	0.0	6	11.3	1
MASTER	235	128	2	2	1.6	22.7	0	0.0	7	5.5	0	0.0	23	18.0	3
MATK	73	80	0	0	0.0	31.3	0	0.0	9	11.3	0	0.0	14	17.5	1
MATRIX	333	230	0	0	0.0	20.4	0	0.0	13	5.7	8	3.5	24	10.4	4
MESAGE	17	10	3	3	30.0	10.0	0	0.0	0	0.0	0	0.0	0	0.0	0
MESH	104	39	0	0	0.0	20.5	1	2.6	3	7.7	0	0.0	4	10.3	0
MGCWRD	12	11	0	0	0.0	18.2	0	0.0	2	18.2	0	0.0	1	9.1	0
MIX1D	64	75	0	0	0.0	30.7	0	0.0	7	9.3	0	0.0	14	18.7	0
MIX2D	33	37	0	0	0.0	29.7	0	0.0	7	18.9	0	0.0	8	21.6	0
MIX2M	7	5	0	0	0.0	40.0	0	0.0	0	0.0	0	0.0	0	0.0	0
MIXCRS	16	15	0	0	0.0	26.7	0	0.0	1	6.7	0	0.0	2	13.3	0
MIXER	111	70	0	0	0.0	17.1	0	0.0	1	1.4	2	2.9	6	8.6	1
MIXIT	77	58	0	0	0.0	19.0	1	1.7	8	13.8	0	0.0	7	12.1	1
MIXMIX	150	149	0	0	0.0	25.5	0	0.0	16	10.7	0	0.0	19	12.8	3
MOVE	7	5	0	0	0.0	40.0	0	0.0	0	0.0	0	0.0	0	0.0	0
NNITL	14	9	0	0	0.0	33.3	0	0.0	0	0.0	0	0.0	0	0.0	0
NORM1D	43	41	0	0	0.0	36.6	0	0.0	5	12.2	0	0.0	5	12.2	0
NORM2D	19	19	0	0	0.0	31.6	0	0.0	2	10.5	0	0.0	2	10.5	0

## KENO5A Analysis

June 7, 1994

NSTART	51	18	0	0	0.0	22.2	0	0.0	1	5.6	0	0.0	2	11.1	0
NSUPG	372	200	0	0	0.0	19.5	0	0.0	12	6.0	0	0.0	28	14.0	2
OPENDA	89	69	6	6	8.7	13.0	0	0.0	0	0.0	2	2.9	1	1.4	1
OPNFIL	5	3	0	0	0.0	33.3	0	0.0	0	0.0	0	0.0	0	0.0	0
PARAM	528	309	13	8	2.6	34.0	1	0.3	23	7.4	9	2.9	66	21.4	1
PLTKEF	115	103	0	0	0.0	14.6	0	0.0	2	1.9	2	1.9	6	5.8	2
POINT	181	121	0	0	0.0	8.3	0	0.0	1	0.8	0	0.0	9	7.4	2
POSIT	122	100	0	0	0.0	48.0	3	3.0	29	29.0	0	0.0	27	27.0	2
PRANG	66	55	0	0	0.0	23.6	0	0.0	3	5.5	0	0.0	4	7.3	1
PRINT	86	44	0	0	0.0	18.2	0	0.0	0	0.0	1	2.3	3	6.8	1
PRT1D	45	47	0	0	0.0	31.9	0	0.0	10	21.3	0	0.0	8	17.0	1
PRT1DS	14	8	0	0	0.0	25.0	0	0.0	0	0.0	0	0.0	0	0.0	0
PRT2DS	78	69	0	0	0.0	20.3	0	0.0	4	5.8	0	0.0	6	8.7	0
PRTARA	31	13	0	0	0.0	38.5	0	0.0	1	7.7	0	0.0	3	23.1	0
PRTFLX	19	12	0	0	0.0	33.3	0	0.0	0	0.0	0	0.0	1	8.3	0
PRTJOM	206	118	0	0	0.0	28.8	1	0.8	22	18.6	0	0.0	23	19.5	1
PRTLBA	104	80	0	0	0.0	30.0	0	0.0	0	0.0	7	8.8	8	10.0	1
PRTMIX	13	3	0	0	0.0	33.3	0	0.0	0	0.0	0	0.0	0	0.0	0
PRTPLT	126	38	0	0	0.0	23.7	1	2.6	4	10.5	1	2.6	1	2.6	0
PRTWTS	68	61	0	0	0.0	31.1	0	0.0	11	18.0	0	0.0	12	19.7	1
PRTXS	111	73	0	0	0.0	27.4	0	0.0	5	6.8	3	4.1	6	8.2	1
PULL	3	2	0	0	0.0	50.0	0	0.0	0	0.0	0	0.0	0	0.0	0
Q	24	18	0	0	0.0	22.2	0	0.0	2	11.1	0	0.0	2	11.1	0
RATIO	75	49	0	0	0.0	18.4	0	0.0	1	2.0	2	4.1	2	4.1	0
RCHRS	30	25	0	0	0.0	16.0	0	0.0	1	4.0	1	4.0	2	8.0	0
RDALB	49	36	0	0	0.0	16.7	0	0.0	1	2.8	0	0.0	1	2.8	0
RDARA	27	16	0	0	0.0	25.0	0	0.0	1	6.3	1	6.3	1	6.3	0
RDBIAS	145	99	0	0	0.0	22.2	1	1.0	16	16.2	1	1.0	13	13.1	1
RDBOX	145	124	0	0	0.0	35.5	0	0.0	7	5.6	0	0.0	39	31.5	2
RDCALC	213	111	0	0	0.0	50.5	0	0.0	2	1.8	10	9.0	22	19.8	2
RDGRP	55	14	0	0	0.0	57.1	0	0.0	2	14.3	0	0.0	3	21.4	0
RDICE	51	32	0	0	0.0	25.0	0	0.0	4	12.5	0	0.0	5	15.6	0
RDMIXT	8	5	0	0	0.0	40.0	0	0.0	0	0.0	0	0.0	0	0.0	0
RDORGN	28	28	0	0	0.0	17.9	0	0.0	4	14.3	0	0.0	3	10.7	0
RDPLT	262	227	0	0	0.0	20.7	2	0.9	22	9.7	14	6.2	12	5.3	2
RDREF	118	59	0	0	0.0	37.3	0	0.0	12	20.3	0	0.0	11	18.6	1
RDRST	190	147	0	0	0.0	21.1	1	0.7	37	25.2	0	0.0	24	16.3	2
RDSTRT	109	62	0	0	0.0	22.6	1	1.6	8	12.9	6	9.7	2	3.2	1
RDTAPE	239	197	0	0	0.0	22.8	0	0.0	16	8.1	1	0.5	27	13.7	3
RDWTS	27	16	0	0	0.0	18.8	0	0.0	1	6.3	0	0.0	1	6.3	0
READGM	129	87	0	0	0.0	34.5	0	0.0	17	19.5	0	0.0	20	23.0	1
RELATE	40	32	0	0	0.0	28.1	0	0.0	1	3.1	0	0.0	5	15.6	0

## KENO5A Analysis

June 7, 1994

RESET	100	49	0	0	0.0	38.8	0	0.0	0	0.0	4	8.2	8	16.3	1
RGUSED	48	34	3	1	2.9	41.2	0	0.0	7	20.6	0	0.0	9	26.5	0
RNDIN	11	4	5	5	125.0	25.0	0	0.0	0	0.0	0	0.0	0	0.0	0
RNDOUT	11	4	5	5	125.0	25.0	0	0.0	0	0.0	0	0.0	0	0.0	0
RT	14	7	0	0	0.0	14.3	0	0.0	0	0.0	0	0.0	0	0.0	0
RTADJ	15	12	0	0	0.0	25.0	0	0.0	0	0.0	1	8.3	0	0.0	0
RTARA	73	29	0	0	0.0	17.2	0	0.0	0	0.0	1	3.4	1	3.4	0
SAVST6	35	25	0	0	0.0	20.0	0	0.0	0	0.0	0	0.0	2	8.0	0
SCANON	48	27	0	0	0.0	11.1	0	0.0	0	0.0	0	0.0	2	7.4	0
SCOOT	17	15	0	0	0.0	40.0	0	0.0	1	6.7	0	0.0	1	6.7	0
SFLRA	4	3	0	0	0.0	33.3	0	0.0	0	0.0	0	0.0	0	0.0	0
SGALB	30	19	0	0	0.0	26.3	0	0.0	0	0.0	0	0.0	0	0.0	0
SGWT	12	6	0	0	0.0	33.3	0	0.0	0	0.0	0	0.0	0	0.0	0
SORTA	231	174	0	0	0.0	33.3	0	0.0	15	8.6	7	4.0	23	13.2	1
SORTBK	44	42	0	0	0.0	19.0	0	0.0	5	11.9	0	0.0	4	9.5	1
SORTR	63	25	0	0	0.0	36.0	0	0.0	4	16.0	0	0.0	4	16.0	0
SRMAX	90	91	0	0	0.0	16.5	1	1.1	5	5.5	0	0.0	9	9.9	1
SRMIN	143	148	0	0	0.0	20.9	1	0.7	6	4.1	10	6.8	11	7.4	3
START	355	253	0	0	0.0	33.6	2	0.8	34	13.4	3	1.2	46	18.2	5
START0	20	5	0	0	0.0	20.0	0	0.0	0	0.0	0	0.0	0	0.0	0
START1	23	8	0	0	0.0	12.5	0	0.0	0	0.0	0	0.0	0	0.0	0
START2	43	20	0	0	0.0	20.0	0	0.0	2	10.0	0	0.0	3	15.0	0
START3	23	8	0	0	0.0	12.5	0	0.0	0	0.0	0	0.0	0	0.0	0
START4	23	6	0	0	0.0	16.7	0	0.0	0	0.0	0	0.0	0	0.0	0
START5	26	8	0	0	0.0	25.0	0	0.0	0	0.0	0	0.0	1	12.5	0
START6	73	41	0	0	0.0	34.1	0	0.0	0	0.0	5	12.2	4	9.8	0
STATIS	88	44	0	0	0.0	22.7	0	0.0	5	11.4	0	0.0	5	11.4	1
STOP	6	3	0	0	0.0	33.3	0	0.0	0	0.0	0	0.0	0	0.0	0
STRTSU	124	104	0	0	0.0	11.5	2	1.9	6	5.8	0	0.0	4	3.8	0
SUMSCT	21	19	0	0	0.0	26.3	0	0.0	1	5.3	0	0.0	1	5.3	0
TIMER	21	6	12	4	66.7	16.7	0	0.0	0	0.0	0	0.0	0	0.0	0
TIMFAC	4	3	0	0	0.0	33.3	0	0.0	0	0.0	0	0.0	0	0.0	0
TRACK	788	828	8	7	0.8	29.7	4	0.5	169	20.4	2	0.2	181	21.9	3
TRKWRT	33	9	0	0	0.0	33.3	0	0.0	0	0.0	0	0.0	2	22.2	0
UNTCRS	10	9	0	0	0.0	33.3	0	0.0	1	11.1	0	0.0	1	11.1	0
VECADD	7	5	0	0	0.0	40.0	0	0.0	0	0.0	0	0.0	0	0.0	0
VECDIF	7	5	0	0	0.0	40.0	0	0.0	0	0.0	0	0.0	0	0.0	0
VECNRM	7	5	0	0	0.0	40.0	0	0.0	0	0.0	0	0.0	0	0.0	0
VOLFIS	77	36	0	0	0.0	41.7	0	0.0	5	13.9	0	0.0	10	27.8	0
VOLUME	229	168	0	0	0.0	31.5	1	0.6	20	11.9	8	4.8	27	16.1	2
WAITIN	78	46	0	0	0.0	15.2	0	0.0	0	0.0	4	8.7	0	0.0	1
WATES	122	89	0	0	0.0	28.1	0	0.0	10	11.2	1	1.1	11	12.4	1

## KENO5A Analysis

June 7, 1994

WRTALB	36	22	0	0	0.0	18.2	0	0.0	1	4.5	0	0.0	1	4.5	0
WRTARA	23	13	0	0	0.0	30.8	0	0.0	3	23.1	0	0.0	2	15.4	0
WRTCAL	104	35	5	3	8.6	25.7	0	0.0	0	0.0	0	0.0	7	20.0	0
WRTGRP	49	9	0	0	0.0	33.3	0	0.0	0	0.0	0	0.0	1	11.1	0
WRTICE	42	22	0	0	0.0	31.8	0	0.0	4	18.2	0	0.0	4	18.2	0
WRTPLT	16	13	0	0	0.0	23.1	0	0.0	0	0.0	0	0.0	1	7.7	0
WRTRST	183	136	0	0	0.0	21.3	1	0.7	29	21.3	0	0.0	22	16.2	1
WRTWTS	23	11	0	0	0.0	27.3	0	0.0	0	0.0	0	0.0	1	9.1	0
XLNTHS	22	21	0	0	0.0	19.0	0	0.0	1	4.8	0	0.0	1	4.8	0
XRMIN	149	151	0	0	0.0	21.2	1	0.7	16	10.6	9	6.0	16	10.6	2
XSECID	69	56	0	0	0.0	32.1	0	0.0	8	14.3	0	0.0	8	14.3	1
XXIN	22	20	0	0	0.0	30.0	0	0.0	1	5.0	0	0.0	3	15.0	0
XXLIM	56	51	0	0	0.0	21.6	1	2.0	14	27.5	0	0.0	5	9.8	1
XXMIN	237	232	0	0	0.0	32.8	1	0.4	12	5.2	18	7.8	18	7.8	3
YOREAD	34	18	0	0	0.0	27.8	0	0.0	1	5.6	2	11.1	2	11.1	0
YREAD	223	184	6	6	3.3	21.7	0	0.0	7	3.8	18	9.8	8	4.3	1
ZREAD	88	82	0	0	0.0	29.3	1	1.2	10	12.2	1	1.2	19	23.2	1

## Legend of Metrics in Report

loc -- lines of code  
 sloc -- number of executable statements  
 cmnt -- total number of comments  
 ncomt -- number of non-blank COMMENT statements  
 100\*ncomt/sloc -- percent, nonblank comments to number of executable statements  
 100\*vg2/sloc -- percent, extended complexity of number of executable statements  
 cgoto -- number of COMPUTED GO TO statements  
 100\*cgoto/sloc -- percent, computed GOTO's to number of executable statements  
 ugoto -- number of UNCONDITIONAL GO TO statements  
 100\*ugoto/sloc -- percent, unconditional GOTO's to number of executable statements  
 bIF -- number of BLOCK IF statements  
 100\*bif/sloc -- percent, Block IF statements to number of executable statements  
 lIF -- number of LOGICAL IF statements  
 100\*lif/sloc -- percent, logical IF statements to number of executable statements  
 Bhat -- Halstead's predicted number of errors in writing code