Program name/version: LSAdjGPSvectors: Version 2014-A Note: Output has been annotated for readability.

The user is: Earl F. Burkholder
Program used on: August 4, 2016
The input file for program is: Ch13GPS2011.dat
The name of this output file is: Ch13GPS2011Ans.out File renamed Figure 13.3.docx

The client is: WISCORS - 16 baselines and holding FOLA and KEHA at 0.002 m NAD 83(2011)
The project is: This file documents the network adjustment for Chapter 13.

Three input matrices are F, B, and Q as shown in Tables 13.4, 13.5, and 13.6. The original computer printout contained a listing of all input data. They are not repeated here.

The weight matrix is the inverse of the Q matrix and could have been printed but was omitted. The inverse of the normal equations (N inverse) is:

Ninv 27 X 27

2.63676102E-6 -5.48656843E-8 -1.73752545E-8 2.27832949E-6 -1.0786609E-7 9.01748207E-8 2.25082689E-6 -2.55361577E-7 1.43925117E-7 2.33330639E-6 -1.34603208E-7 6.75031951E-8 2.18174054E-6 -2.68577345E-7 1.79038825E-7 2.10628549E-6 -2.06452266E-7 1.08947787E-7 1.98521312E-6 -1.49578782E-7 8.54083646E-8 2.06220315E-6 -8.00321968E-8 -4.50111475E-8 1.36323898E-6 5.48656843E-8 1.73752545E-8
-5.48656843E-8 3.52354163E-6 -4.38046131E-7 -3.69590972E-8 3.1495218E-6 -3.68419523E-7 -7.28276329E-8 2.86332553E-6 -2.73668395E-7 -4.7768997E-8 2.99134358E-6 -2.84278309E-7 -6.08022815E-8 2.62941676E-6 -1.55994478E-7 -5.3997763E-8 2.48846774E-6 -2.47740287E-7 -3.19868348E-8 2.21835276E-6 -2.54771406E-7 -5.06115621E-8 2.43994893E-6 -3.73419489E-7 5.48656843E-8 4.76458374E-7 4.38046131E-7
-1.73752545E-8 -4.38046131E-7 3.24014452E-6 2.21002617E-8 -1.31060303E-7 2.64198632E-6 -1.11976465E-8 -5.63660689E-8 2.43885305E-6 -2.38478679E-9 -1.02299575E-7 2.60050998E-6 4.30809387E-9 2.4211416E-7 2.08342665E-6
-1.05698511E-8 6.50465644E-8 1.97607092E-6 -5.06829902E-9 2.25515225E-7 1.52692915E-6 -4.15590258E-8 -5.04741844E-8 1.85116012E-6 1.73752545E-8 4.38046131E-7 7.59855482E-7

2.27832949E-6 -3.69590972E-8 2.21002617E-8 3.2645941E-6 -7.97622278E-7 5.16134788E-7 2.56568212E-6 -2.04696456E-8 -8.91994411E-8 2.64303916E-6 -2.03717204E-7 1.23491295E-7 2.61667266E-6 -1.03102662E-7 -3.65912865E-8
2.57596221E-6 -1.65488995E-7 -4.04933363E-8 2.47910436E-6 -2.31261152E-7 2.41134976E-8 2.63770488E-6 -2.48525168E-7 -7.75339712E-8 1.72167051E-6 3.69590972E-8 -2.21002617E-8
-1.0786609E-7 3.1495218E-6 -1.31060303E-7 -7.97622278E-7 1.9873703E-5 -1.24747383E-5 -2.4506948E-8 7.31158351E-6
-3.56244498E-6 -2.28849922E-7 8.13160691E-6 -4.42367301E-6 -1.17836212E-7 8.82118075E-6 -4.91214086E-6 -1.26246235E-7 8.06089011E-6 -4.24313886E-6 -1.3676822E-7 7.17426443E-6 -3.61195951E-6 -2.15470176E-7
8.72447156E-6 -4.7588442E-6 1.0786609E-7 8.50478202E-7 1.31060303E-7
9.01748207E-8 -3.68419523E-7 2.64198632E-6 5.16134788E-7 -1.24747383E-5 1.41495616E-5 -1.24443128E-7 -3.54004288E-6 5.46755265E-6 1.31937467E-7 -4.46461824E-6 6.74700589E-6 -3.31637603E-8 -4.69116582E-6
6.51043604E-6 -6.71050236E-8 -4.16729345E-6 5.73165232E-6 -4.88171348E-8 -3.40929394E-6 4.73253912E-6 -6.50138113E-8 -4.7253551E-6 6.06781967E-6 -9.01748207E-8 3.68419523E-7 1.35801368E-6

2.25082689E-6 -7.28276329E-8 -1.11976465E-8 2.56568212E-6 -2.4506948E-8 -1.24443128E-7 3.61611379E-6
2.36853765E-7 -3.42418492E-7 2.7726564E-6 -1.38478688E-7 -1.33580312E-7 2.80160904E-6 -4.20534932E-7 1.7603297E-
7 2.82004715E-6 -2.45233749E-7 9.41182921E-8 2.58977188E-6 -1.18613157E-7 5.79156989E-8 2.60934553E-6
4.47125718E-8 -1.66352613E-7 1.74917311E-6 7.28276329E-8 1.11976465E-8
-2.55361577E-7 2.86332553E-6 -5.63660689E-8 -2.04696456E-8 7.31158351E-6 -3.54004288E-6 2.36853765E-7
2.2771683E-5 -1.37568983E-5 -2.50587943E-7 1.17743625E-5 -5.93637874E-6 -2.91676474E-7 1.1666472E-5 -5.922815E-6
-1.67243986E-7 1.32427057E-5 -7.45674053E-6 -7.71439188E-8 1.06135231E-5 -5.66510971E-6 -7.64179881E-8
1.1800469E-5 -6.73346209E-6 2.55361577E-7 1.13667447E-6 5.63660689E-8
1.43925117E-7 -2.73668395E-7 2.43885305E-6 -8.91994411E-8 -3.56244498E-6 5.46755265E-6 -3.42418492E-7 -
1.37568983E-5 1.46524132E-5 -2.67116446E-8 -5.79391016E-6 7.40757833E-6 7.2622368E-8 -5.69634781E-6 7.6196415E-6
1.33345393E-9 -7.44447357E-6 8.73949829E-6 -1.10330436E-8 -5.53292822E-6 6.49530272E-6 -8.68924037E-8 -
6.76964313E-6 7.60877623E-6 -1.43925117E-7 2.73668395E-7 1.56114695E-6

2.33330639E-6 -4.7768997E-8 -2.38478679E-9 2.64303916E-6 -2.28849922E-7 1.31937467E-7 2.7726564E-6 -2.50587943E-
7 -2.67116446E-8 3.13582297E-6 -6.86797142E-7 3.72612625E-7 2.7747815E-6 -6.5983166E-7 3.64196473E-7
2.60917807E-6 -3.6607831E-7 1.2385136E-7 2.44119656E-6 -2.71438743E-7 1.08247296E-7 2.51797164E-6 -1.78246937E-7
-4.72579674E-8 1.66669361E-6 4.7768997E-8 2.38478679E-9
-1.34603208E-7 2.99134358E-6 -1.02299575E-7 -2.03717204E-7 8.13160691E-6 -4.46461824E-6 -1.38478688E-7
1.17743625E-5 -5.79391016E-6 -6.86797142E-7 1.77255095E-5 -1.09025694E-5 -5.98621358E-7 1.08557413E-5 -
5.18719919E-6 -3.11091792E-7 1.03118881E-5 -5.2657139E-6 -2.03021085E-7 8.89936669E-6 -4.53441325E-6 -
1.97169402E-7 1.05147431E-5 -5.95447731E-6 1.34603208E-7 1.00865642E-6 1.02299575E-7
6.75031951E-8 -2.84278309E-7 2.60050998E-6 1.23491295E-7 -4.42367301E-6 6.74700589E-6 -1.33580312E-7 -
5.93637874E-6 7.40757833E-6 3.72612625E-7 -1.09025694E-5 1.27948746E-5 3.28974846E-7 -5.24682076E-6 7.01540449E-
6 9.22001303E-8 -5.3245428E-6 6.60464706E-6 6.1289068E-8 -4.39383808E-6 5.39555732E-6 -3.47265342E-9 -
5.94076007E-6 6.84669089E-6 -6.75031951E-8 2.84278309E-7 1.39949002E-6

2.18174054E-6 -6.08022815E-8 4.30809387E-9 2.61667266E-6 -1.17836212E-7 -3.31637603E-8 2.80160904E-6 -
2.91676474E-7 7.2622368E-8 2.7747815E-6 -5.98621358E-7 3.28974846E-7 3.24255617E-6 -1.04419553E-6 6.12846558E-7
2.86747764E-6 -3.6546541E-7 1.14607039E-7 2.66803872E-6 -2.03109557E-7 5.95566414E-8 2.73383161E-6 -1.54272434E-
8 -1.75258746E-7 1.81825946E-6 6.08022815E-8 -4.30809387E-9
-2.68577345E-7 2.62941676E-6 2.4211416E-7 -1.03102662E-7 8.82118075E-6 -4.69116582E-6 -4.20534932E-7 1.1666472E-
5 -5.69634781E-6 -6.5983166E-7 1.08557413E-5 -5.24682076E-6 -1.04419553E-6 1.71577785E-5 -9.07152371E-6 -
4.50123869E-7 1.52101605E-5 -8.51755011E-6 -2.53252586E-7 1.37108135E-5 -7.79688676E-6 -1.85978341E-7
1.70483225E-5 -1.06929597E-5 2.68577345E-7 1.37058324E-6 -2.4211416E-7
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7.6196415E-6 3.64196473E-7 -5.18719919E-6 7.01540449E-6 6.12846558E-7 -9.07152371E-6 1.12133959E-5 1.84194449E-7
-8.73565417E-6 9.72124297E-6 9.13091035E-8 -7.88085291E-6 8.38162801E-6 -4.59600356E-8 -1.10115377E-5 1.108684E-
5 -1.79038825E-7 1.55994478E-7 1.91657335E-6

2.10628549E-6 -5.3997763E-8 -1.05698511E-8 2.57596221E-6 -1.26246235E-7 -6.71050236E-8 2.82004715E-6 -
1.67243986E-7 1.33345393E-9 2.60917807E-6 -3.11091792E-7 9.22001303E-8 2.86747764E-6 -4.50123869E-7 1.84194449E-
7 3.22173936E-6 -2.60527636E-7 -5.7502207E-8 2.87105185E-6 -2.73085776E-7 1.16544288E-7 2.79306278E-6 -
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-2.06452266E-7 2.48846774E-6 6.50465644E-8 -1.65488995E-7 8.06089011E-6 -4.16729345E-6 -2.45233749E-7
1.32427057E-5 -7.44447357E-6 -3.6607831E-7 1.03118881E-5 -5.3245428E-6 -3.6546541E-7 1.52101605E-5 -8.73565417E-

6 -2.60527636E-7 2.26907308E-5 -1.43634201E-5 -2.46805699E-7 1.59483972E-5 -9.10361549E-6 -3.57270057E-7
1.54451924E-5 -8.86374861E-6 2.06452266E-7 1.51153226E-6 -6.50465644E-8
1.08947787E-7 -2.47740287E-7 1.97607092E-6 -4.04933363E-8 -4.24313886E-6 5.73165232E-6 9.41182921E-8 -
7.45674053E-6 8.73949829E-6 1.2385136E-7 -5.2657139E-6 6.60464706E-6 1.14607039E-7 -8.51755011E-6 9.72124297E-6
-5.7502207E-8 -1.43634201E-5 1.5316661E-5 6.74253524E-8 -9.09372997E-6 9.76919379E-6 1.01846121E-7 -9.00091017E-
6 9.68554471E-6 -1.08947787E-7 2.47740287E-7 2.02392908E-6

1.98521312E-6 -3.19868348E-8 -5.06829902E-9 2.47910436E-6 -1.3676822E-7 -4.88171348E-8 2.58977188E-6 -
7.71439188E-8 -1.10330436E-8 2.44119656E-6 -2.03021085E-7 6.1289068E-8 2.66803872E-6 -2.53252586E-7 9.13091035E-
8 2.87105185E-6 -2.46805699E-7 6.74253524E-8 3.38805295E-6 -3.52057512E-7 1.93948744E-7 2.75024798E-6 -
4.10611277E-7 1.57180929E-7 2.01478688E-6 3.19868348E-8 5.06829902E-9
-1.49578782E-7 2.21835276E-6 2.25515225E-7 -2.31261152E-7 7.17426443E-6 -3.40929394E-6 -1.18613157E-7
1.06135231E-5 -5.53292822E-6 -2.71438743E-7 8.89936669E-6 -4.39383808E-6 -2.03109557E-7 1.37108135E-5 -
7.88085291E-6 -2.73085776E-7 1.59483972E-5 -9.09372997E-6 -3.52057512E-7 2.40005799E-5 -1.48188594E-5 -
4.99962685E-7 1.40174451E-5 -7.49065788E-6 1.49578782E-7 1.78164724E-6 -2.25515225E-7
8.54083646E-8 -2.54771406E-7 1.52692915E-6 2.41134976E-8 -3.61195951E-6 4.73253912E-6 5.79156989E-8 -
5.66510971E-6 6.49530272E-6 1.08247296E-7 -4.53441325E-6 5.39555732E-6 5.95566414E-8 -7.79688676E-6 8.38162801E-
6 1.16544288E-7 -9.10361549E-6 9.76919379E-6 1.93948744E-7 -1.48188594E-5 1.55374217E-5 2.54228851E-7 -
7.57831099E-6 8.41016134E-6 -8.54083646E-8 2.54771406E-7 2.47307085E-6

2.06220315E-6 -5.06115621E-8 -4.15590258E-8 2.63770488E-6 -2.15470176E-7 -6.50138113E-8 2.60934553E-6 -
7.64179881E-8 -8.68924037E-8 2.51797164E-6 -1.97169402E-7 -3.47265342E-9 2.73383161E-6 -1.85978341E-7 -
4.59600356E-8 2.79306278E-6 -3.57270057E-7 1.01846121E-7 2.75024798E-6 -4.99962685E-7 2.54228851E-7 3.00608161E-
6 -6.74699122E-7 3.29049227E-7 1.93779685E-6 5.06115621E-8 4.15590258E-8
-8.00321968E-8 2.43994893E-6 -5.04741844E-8 -2.48525168E-7 8.72447156E-6 -4.7253551E-6 4.47125718E-8 1.1800469E-
5 -6.76964313E-6 -1.78246937E-7 1.05147431E-5 -5.94076007E-6 -1.54272434E-8 1.70483225E-5 -1.10115377E-5 -
2.65377254E-7 1.54451924E-5 -9.00091017E-6 -4.10611277E-7 1.40174451E-5 -7.57831099E-6 -6.74699122E-7
1.7515438E-5 -9.96307743E-6 8.00321968E-8 1.56005107E-6 5.04741844E-8
-4.50111475E-8 -3.73419489E-7 1.85116012E-6 -7.75339712E-8 -4.7588442E-6 6.06781967E-6 -1.66352613E-7 -
6.73346209E-6 7.60877623E-6 -4.72579674E-8 -5.95447731E-6 6.84669089E-6 -1.75258746E-7 -1.06929597E-5 1.108684E-
5 3.6357988E-8 -8.86374861E-6 9.68554471E-6 1.57180929E-7 -7.49065788E-6 8.41016134E-6 3.29049227E-7 -
9.96307743E-6 1.11817178E-5 4.50111475E-8 3.73419489E-7 2.14883988E-6

1.36323898E-6 5.48656843E-8 1.73752545E-8 1.72167051E-6 1.0786609E-7 -9.01748207E-8 1.74917311E-6 2.55361577E-7
-1.43925117E-7 1.66669361E-6 1.34603208E-7 -6.75031951E-8 1.81825946E-6 2.68577345E-7 -1.79038825E-7
1.89371451E-6 2.06452266E-7 -1.08947787E-7 2.01478688E-6 1.49578782E-7 -8.54083646E-8 1.93779685E-6 8.00321968E-
8 4.50111475E-8 2.63676102E-6 -5.48656843E-8 -1.73752545E-8
5.48656843E-8 4.76458374E-7 4.38046131E-7 3.69590972E-8 8.50478202E-7 3.68419523E-7 7.28276329E-8 1.13667447E-6
2.73668395E-7 4.7768997E-8 1.00865642E-6 2.84278309E-7 6.08022815E-8 1.37058324E-6 1.55994478E-7 5.3997763E-8
1.51153226E-6 2.47740287E-7 3.19868348E-8 1.78164724E-6 2.54771406E-7 5.06115621E-8 1.56005107E-6 3.73419489E-7
-5.48656843E-8 3.52354163E-6 -4.38046131E-7
1.73752545E-8 4.38046131E-7 7.59855482E-7 -2.21002617E-8 1.31060303E-7 1.35801368E-6 1.11976465E-8 5.63660689E-8
1.56114695E-6 2.38478679E-9 1.02299575E-7 1.39949002E-6 -4.30809387E-9 -2.4211416E-7 1.91657335E-6 1.05698511E-8
-6.50465644E-8 2.02392908E-6 5.06829902E-9 -2.25515225E-7 2.47307085E-6 4.15590258E-8 5.04741844E-8 2.14883988E-
6 -1.73752545E-8 -4.38046131E-7 3.24014452E-6

Delta - the answers - X/Y/Z in meters.

124,517.64562		149,899.212		115,561.95436	
-4,609,735.81196	FOLA	-4,637,713.16888	WEBE	-4,706,440.30029	WATH
4,391,808.83078		4,361,716.03796		4,289,090.74715	
182,409.48216		153,059.63023		164,796.25211	
-4,611,414.93873	SHAN	-4,666,858.81245	RASN	-4,679,186.50767	SIW2
4,387,983.54545		4,330,615.80371		4,316,889.72405	
102,706.41607		114,970.93919		170,846.09348	
-4,657,769.22343	WAWN	-4,680,260.75314	PAR0	-4,702,276.07364	KEHA
4,341,771.60252		4,317,398.78716		4,291,680.31732	

Residuals - also in meters.

0.00112		0.00516		0.00008	
-0.00046	FOLA	-0.02102	6	0.00153	12
0.00008		0.01019		-0.00289	
-0.00146		-0.00188		0.00017	
0.00323	1	-0.00471	7	-0.00115	13
-0.00633		0.00765		0.00099	
0.00245		-0.00076		0.00026	
0.01453	2	0.00143	8	0.00137	14
0.00374		0.00075		0.00011	
0.00137		-0.00005		0.00111	
-0.00392	3	0.00306	9	0.00265	15
0.00018		-0.0064		0.00017	
		-0.00012			
-0.00216		-0.00022	10	0.00137	
-0.00615	4	-0.00166		-0.01397	16
0.00151				0.00727	
-0.00092		0.00096			
-0.00355	5	0.00031	11	-0.00112	
-0.00344		-0.00154		0.00046	KEHA
				-0.00008	

Redundancy, R = 27

Reference Variance = SigmaNaughtSquared = 2.21472105E0

The covariance matrix of computed parameters is the product of Ninv and the refence variance. Note that the covariance matrix of each station has been underlined.

Reference Variance * Ninv

FOLA

5.83969012E-6 -1.21512186E-7 -3.84813418E-8 5.04586428E-6 -2.38893299E-7 1.99712073E-7 4.98495369E-6 -5.6555466E-7 3.18753985E-7 5.16762277E-6 -2.98108557E-7 1.49500747E-7 4.8319467E-6 -5.94823898E-7 3.96521054E-7 4.6648348E-6 -4.57234178E-7 2.41288956E-7 4.39669328E-6 -3.31275277E-7 1.89155703E-7 4.56720471E-6 -1.77248991E-7 -9.96871357E-8 3.01919406E-6 1.21512186E-7 3.84813418E-8

-1.21512186E-7 7.8036618E-6 -9.70149986E-7 -8.18540905E-8 6.97531221E-6 -8.15946472E-7 -1.61292891E-7 6.34146732E-6 -6.06099154E-7 -1.05795003E-7 6.62499158E-6 -6.29597154E-7 -1.34660092E-7 5.82342465E-6 -3.45484253E-7 -1.19589982E-7 5.51126188E-6 -5.48675628E-7 -7.08419162E-8 4.91303254E-6 -5.64247595E-7 -1.12090492E-7 5.40380625E-6 -8.27020001E-7 1.21512186E-7 1.05522239E-6 9.70149986E-7

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SHAN

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WAWN

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-5.6555466E-7 6.34146732E-6 -1.24835119E-7 -4.53345549E-8 1.61931179E-5 -7.84020747E-6 5.24565019E-7

5.04329255E-5 -3.04676923E-5 -5.54982391E-7 2.60769285E-5 -1.31474229E-5 -6.45982026E-7 2.5837981E-5 -1.3117383E-5 -3.70398775E-7 2.93288991E-5 -1.65146002E-5 -1.70852261E-7 2.3505993E-5 -1.25466377E-5 -1.69244526E-7 2.6134747E-5 -1.49127402E-5 5.6555466E-7 2.51741687E-6 1.24835119E-7

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1.68753804E-5 2.95322848E-9 -1.64874323E-5 1.93555508E-5 -2.44351139E-8 -1.22538926E-5 1.43852836E-5 -
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WEBE
5.16762277E-6 -1.05795003E-7 -5.2816375E-9 5.85359446E-6 -5.06838739E-7 2.92204685E-7 6.14066049E-6 -
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8.06593593E-7 5.77860159E-6 -8.10761338E-7 2.74296213E-7 5.4065694E-6 -6.01161098E-7 2.39737564E-7 5.57660479E-6
-3.94767243E-7 -1.04663215E-7 3.69126141E-6 1.05795003E-7 5.2816375E-9
-2.98108557E-7 6.62499158E-6 -2.26565021E-7 -4.5117678E-7 1.8009241E-5 -9.88788399E-6 -3.06691665E-7
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4.36675225E-7 2.32872229E-5 -1.31875062E-5 2.98108557E-7 2.2338926E-6 2.26565021E-7
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-8.09403935E-7 2.53822621E-7 5.9089615E-6 -4.49831011E-7 1.31901347E-7 6.05467441E-6 -3.41670407E-8 -
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PAR0
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7 7.13525397E-6 -5.76996038E-7 -1.27351348E-7 6.35857897E-6 -6.04808816E-7 2.58113088E-7 6.18585492E-6 -
5.8773659E-7 8.05228011E-8 4.19404938E-6 1.19589982E-7 2.34092717E-8
-4.57234178E-7 5.51126188E-6 1.44059995E-7 -3.66511959E-7 1.7852623E-5 -9.2293925E-6 -5.43124346E-7 2.93288991E-
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WATH

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-3.31275277E-7 4.91303254E-6 4.99453315E-7 -5.12178939E-7 1.58889944E-5 -7.55063504E-6 -2.62695056E-7
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1.89155703E-7 -5.64247595E-7 3.38172213E-6 5.34046707E-8 -7.99948275E-6 1.0481254E-5 1.28267117E-7 -1.25466377E-
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2.58113088E-7 -2.01619688E-5 2.16360391E-5 4.29542366E-7 -3.28196398E-5 3.44110548E-5 5.63045987E-7 -
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SIW2
4.56720471E-6 -1.12090492E-7 -9.20416491E-8 5.8417805E-6 -4.77206335E-7 -1.43987456E-7 5.77897247E-6 -
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-1.77248991E-7 5.40380625E-6 -1.11786239E-7 -5.50413921E-7 1.93222708E-5 -1.04653434E-5 9.90258738E-8
2.6134747E-5 -1.49928711E-5 -3.94767243E-7 2.32872229E-5 -1.31571264E-5 -3.41670407E-8 3.77572787E-5 -
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1.49427035E-6 3.87918092E-5 -2.20654373E-5 1.77248991E-7 3.45507794E-6 1.11786239E-7
-9.96871357E-8 -8.27020001E-7 4.09980329E-6 -1.71716118E-7 -1.05395124E-5 1.34385279E-5 -3.68424633E-7 -
1.49127402E-5 1.68513169E-5 -1.04663215E-7 -1.31875062E-5 1.51635104E-5 -3.88149233E-7 -2.3681923E-5
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7 -2.20654373E-5 2.47643858E-5 9.96871357E-8 8.27020001E-7 4.7590809E-6
KEHA
3.01919406E-6 1.21512186E-7 3.84813418E-8 3.81301991E-6 2.38893299E-7 -1.99712073E-7 3.87393049E-6 5.6555466E-7
-3.18753985E-7 3.69126141E-6 2.98108557E-7 -1.49500747E-7 4.02693749E-6 5.94823898E-7 -3.96521054E-7
4.19404938E-6 4.57234178E-7 -2.41288956E-7 4.4621909E-6 3.31275277E-7 -1.89155703E-7 4.29167947E-6 1.77248991E-7
9.96871357E-8 5.83969012E-6 -1.21512186E-7 -3.84813418E-8
1.21512186E-7 1.05522239E-6 9.70149986E-7 8.18540905E-8 1.88357197E-6 8.15946472E-7 1.61292891E-7 2.51741687E-6
6.06099154E-7 1.05795003E-7 2.2338926E-6 6.29597154E-7 1.34660092E-7 3.03545954E-6 3.45484253E-7 1.19589982E-7
3.34762231E-6 5.48675628E-7 7.08419162E-8 3.94585164E-6 5.64247595E-7 1.12090492E-7 3.45507794E-6 8.27020001E-7
-1.21512186E-7 7.8036618E-6 -9.70149986E-7
3.84813418E-8 9.70149986E-7 1.68286793E-6 -4.89459148E-8 2.90262012E-7 3.00762148E-6 2.47996633E-8 1.24835119E-7
3.45750501E-6 5.2816375E-9 2.26565021E-7 3.09948001E-6 -9.54122617E-9 -5.36215327E-7 4.24467534E-6 2.34092717E-8
-1.44059995E-7 4.48243832E-6 1.12248685E-8 -4.99453315E-7 5.47716206E-6 9.20416491E-8 1.11786239E-7 4.7590809E-6
-3.84813418E-8 -9.70149986E-7 7.17601626E-6

This is the end of the adjustment. The following section is included in order to clarify interpretation of the covariance matrix of the computed coordinates.

Each station has a symmetric 3x3 covariance matrix on the diagonal of the printout above. The correlation between stations is given in the off-diagonal 3x3 submatrices. The correlation 3x3 submatrices are not themselves symmetrical, but the 3x3 correlation submatrices are transpose symmetrical within the overall solution covariance matrix. These properties are important when computing network and local accuracies in Chapter 14.

The generic format of each 3x3 submatrix is: $\begin{bmatrix} \sigma_1^2 & \sigma_{12} & \sigma_{13} \\ \sigma_{21} & \sigma_2^2 & \sigma_{23} \\ \sigma_{31} & \sigma_{32} & \sigma_3^2 \end{bmatrix}$

The format of a symmetrical 3x3 diagonal submatrix for each station is: $\begin{bmatrix} \sigma_X^2 & \sigma_{XY} & \sigma_{XZ} \\ \sigma_{XY} & \sigma_Y^2 & \sigma_{YZ} \\ \sigma_{XZ} & \sigma_{YZ} & \sigma_Z^2 \end{bmatrix}$

Examples: station covariance matrices for:

FOLA

$$\begin{bmatrix} 5.83969012\text{E}-6 & -1.21512186\text{E}-7 & -3.84813418\text{E}-8 \\ -1.21512186\text{E}-7 & 7.8036618\text{E}-6 & -9.70149986\text{E}-7 \\ -3.84813418\text{E}-8 & -9.70149986\text{E}-7 & 7.17601626\text{E}-6 \end{bmatrix}$$

PAR0

$$\begin{bmatrix} 7.13525397\text{E}-6 & -5.76996038\text{E}-7 & -1.27351348\text{E}-7 \\ -5.76996038\text{E}-7 & 5.0253639\text{E}-5 & -3.18109688\text{E}-5 \\ -1.27351348\text{E}-7 & -3.18109688\text{E}-5 & 3.39221315\text{E}-5 \end{bmatrix}$$

Example correlation between WEBE and WATH

$$\begin{bmatrix} 5.4065694\text{E}-6 & -6.01161098\text{E}-7 & 2.39737564\text{E}-7 \\ -4.49635069\text{E}-7 & 1.97096147\text{E}-5 & -1.00424605\text{E}-5 \\ 1.35738189\text{E}-7 & -9.73112566\text{E}-6 & 1.19496544\text{E}-5 \end{bmatrix}$$

Example correlation between WATH and WEBE

$$\begin{bmatrix} 5.4065694\text{E}-6 & -4.49635069\text{E}-7 & 1.35738189\text{E}-7 \\ -6.01161098\text{E}-7 & 1.97096147\text{E}-5 & -9.73112566\text{E}-6 \\ 2.39737564\text{E}-7 & -1.00424605\text{E}-5 & 1.19496544\text{E}-5 \end{bmatrix}$$