

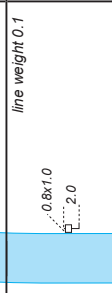
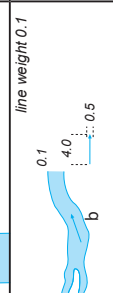
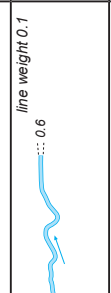
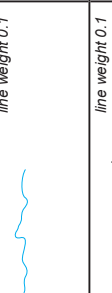
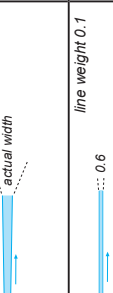
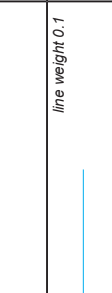
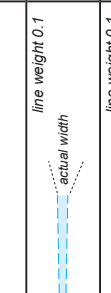
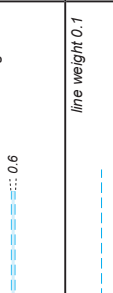
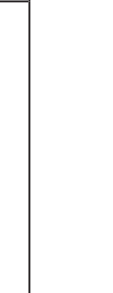

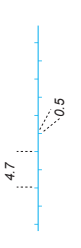
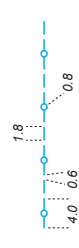

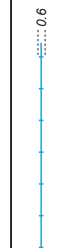
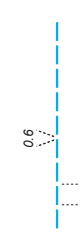
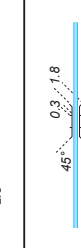














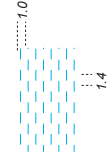
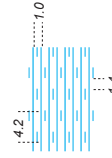
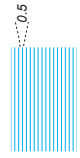
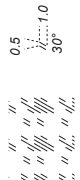

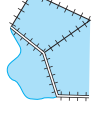
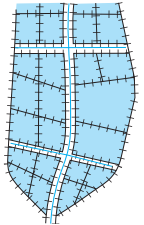

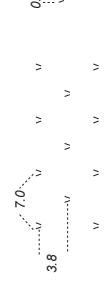
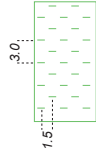
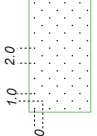
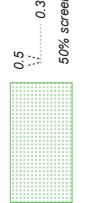
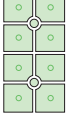
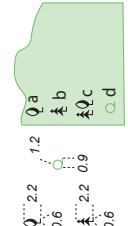


Item	No.	Feature Name	Layer No.	Dxf data type	Over print	USLOVNI ZNAK(Symbol)	Description
D) HIDROGRAFIJA Hydrography a) Objekt 1 Object 1	112	Small ships can navigate	5585	point	On. stroke		
	113	Rafts can sail	5590	point	On. stroke		
	114	Kilometer post	5595	point	On. stroke		
	115	River of 15m or more in width and direction of river flow	a)5310 5310_f b)5597	a) polygon b) point	a) On. stroke 5310 Off. fill 5310_f b) On. stroke, fill		This symbol (a) is shown by two kind of object which are cyan thin line, 30%screened surface, and each type of objects respective layer should be created: 5310, 5310_f.
	116	River of 5m - less than 15m in width	5110_f 5110	line			This symbol is shown by two kind of object which are cyan bold line, 30%screened line, and each type of objects respective layer should be created: 5110_f, 5110.
	117	River of less than 5m in width	5115	line	On. stroke		
	118	Canal of 15m or more in width	5320 5320_f	polygon	On. stroke 5320 Off. fill 5320_f		minimum width 0.6 This symbol (a) is shown by two kind of object which are cyan thin line, 30%screened surface, and each type of objects respective layer should be created: 5320, 5320_f.
	119	Canal of 5m - less than 15m in width	5120_f 5120	line	Off. stroke 5120_f On. stroke 5120		This symbol is shown by two kind of object which are cyan bold line, 30%screened line, and each type of line respective layer should be created: 5120_f, 5120.
	120	Canal of less than 5m in width	5125	line	On. stroke		
	121	Seasonal river and canal (15m or more in width)	5330 5330_f	polygon	On. stroke 5330 Off. fill 5330_f		minimum width 0.6 This symbol (a) is shown by two kind of object which are cyan thin line, 30%screened surface, and each type of objects respective layer should be created: 5330, 5330_f.
	122	Seasonal river and canal (5m - less than 15m in width)	5130_f 5130	line	Off. stroke 5130_f On. stroke 5130		This symbol is shown by two kind of object which are cyan bold line, 30%screened line, and each type of objects respective layer should be created: 5130_f, 5130.
	123	Seasonal river and canal (less than 5m in width)	5135	line	On. stroke		






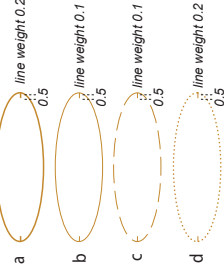
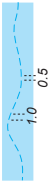
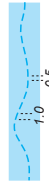
Item	No.	Feature Name	Layer No.	Dxf data type	Over print	USLOVNI ZNAK(Symbol)	Description
D) HIDROGRAFIJA Hydrography a) Objekt 2 Object 2							
124	5140	Concrete waterway on the ground which section is quadrangle, circle or oval	5140	line	On. stroke	 line weight 0.1	
125	5145	Underground irrigation canal with manholes on the ground	5145	line	On. stroke	 line weight 0.2	
126	a)5150 b)5575	a) Water pipe (on the ground) b) Tank on the water pipe	a)5150 b)5575	a)line b)point	On. stroke, fill	 line weight 0.2	
127	5155	Pressurized water pipe on the ground	5155	line	On. stroke	 line weight 0.2	
128	5160	Underground water pipe	5160	line	On. stroke	 line weight 0.3	
129	5165	Waterway bridge	5165	line	On. stroke	 line weight 0.1 (25m or more in length)	
130	5170	Earth dam	5170	line	On. stroke	 line weight 0.3	
131	5175	Concrete dam	5175	line	On. stroke	 line weight 0.15	
132	5180	Movable bridge (ferry for vehicle)	5180	line	On. stroke, fill	 line weight 0.15	
133	5190	Ferry	5190	line	On. stroke, fill	 line weight 0.15	

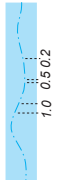
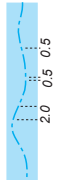
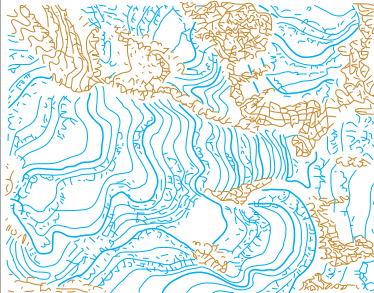


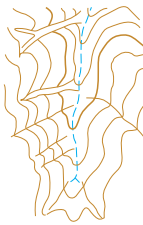

Item	No.	Feature Name	Layer No.	Dxf data type	Over print	USLOVNI ZNAK(Symbol)	Description
D) HIDROGRAFIJA Hydrography a) Objekt 2 Object 2	134	Water gate	5190	line	On. stroke, fill	 line weight 0.15	place as crossing the river
	135	Barraze	5195	line	On. stroke	 line weight 0.1, 0.5	place as crossing the river
	136	Waterfall	a)5555 b)5200	a)point b)line	On. stroke	 line weight 0.3	a)small b)large, acutual length which symbol is placed as crossing the river
	137	Rapid	a)5205 b)5560		On. stroke	 line weight 0.1, 0.2	a)large which shape is as on the ground b)small
	138	Groin	5210	line	On. stroke	 line weight 0.5	length is as on the ground
	139	Pier for ship mooring	5215	line	On. stroke	 line weight 0.2	
	140	Wharf	5220	line	On. stroke	 line weight 0.3	length is as on the ground
	141	Shore protection	5225	line	On. stroke	 line weight 0.2, 0.3	length is as on the ground



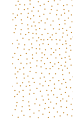

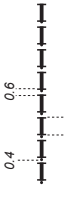




Item	No.	Feature Name	Layer No.	Dxf data type	Over print	USLOVNI ZNAK(Symbol)	Description
D) HIDROGRAFIJA Hydrography a) Objekti 3 Object 3	142	Lake, pond	5340 5340_f	polygon	On. stroke Off. fill	 <p>line weight 0.1</p>	35m x 35m or more This symbol is shown by two kind of object which are cyan thin line, 30%screened surface, and each type of objects respective layer should be created: 5340, 5340_f.
	143	Lake, pond	5345 5345_f	point	On. stroke	 <p>line weight 0.1</p>	less than 35m x 35m This symbol is shown by two kind of object which are cyan thin line, 30%screened surface, and each type of objects respective layer should be created: 5345, 5345_f.
	144	Passable swamp	5350	polygon	On. stroke	 <p>line weight 0.1</p>	75m x 75m or more Used pattern is 5350 from swatch library.
	145	Hardly passable swamp	5355	polygon	On. stroke	 <p>line weight 0.1</p>	75m x 75m or more Used pattern is 5335 from swatch library.
	146	Impassable swamp	5360	polygon	On. stroke	 <p>line weight 0.1</p>	75m x 75m or more Used pattern is 5360 from swatch library.
	147	Peat bog	5370	point	On. stroke	 <p>line weight 0.1</p>	It can use pattern 5370 from swatch library or place on symbol as the old map representation.
	148	Seasonal freshet area, example for map expression	5375	point	On. stroke	 <p>line weight 0.1</p>	place the symbol as the old map representation.
	149	Fishpond, example for map expression	4355 5380 5380_f	polygon	On. stroke Off. fill	 <p>line weight 0.1</p>	

Item	No.	Feature Name	Layer No.	Dxf data type	Over print	USLOVNI ZNAK(Symbol)	Description
D) HIDROGRAFIJA Hydrography a) Objekt 3 Object 3	150	Salt pan, example for map expression	4355 5385 5385_f	polygon	On, stroke Off, fill	<p>line weight 0.1</p> 	
	151	Shoreline	5390 5390_f	polygon	On, stroke Off, fill	<p>line weight 0.1</p> 	
E) VEGETACIJA Vegetation	152	Pasture	Hopyard	polygon	On, stroke Off, fill 6320_f	<p>line weight 0.1</p> 	(75m x 75m or more Used, pattern is 6310 from swatch library.
	153	Hopyard	6320	polygon	On, stroke Off, fill 6320_f	<p>line weight 0.1</p> 	75m x 75m or more Used, pattern is 6320 from swatch library. This symbol is shown by two kind of object which are green boundary line, pattern 6320 surface or rowed symbols, and each type of objects respective layer should be created: 6320, 6320_f.
	154	Vineyard	6330	line	On, stroke	<p>line weight 0.1</p> 	75m x 75m or more Used, pattern is 6330 from swatch library. This symbol is shown by two kind of object which are green boundary line, pattern 6330 surface, and each type of objects respective layer should be created: 6330, 6330_f.
	155	Orchard	6340	polygon	On, stroke Off, fill 6340_f	<p>line weight 0.1</p> 	75m x 75m or more Used, pattern is 6340 from swatch library. This symbol is shown by two kind of object which are green boundary line, pattern 6340 surface, and each type of objects respective layer should be created: 6340, 6340_f.
	156	Park, example for map expression	6350 6350_f	polygon	On, stroke Off, fill 6350_f	<p>line weight 0.1</p> 	(75m x 75m or more) This symbol is shown by two kind of object which are black boundary line, 50% screen surface, and each type of objects respective layer should be created: 6340, 6340_f.
157	Forest	6360 6360_f a)6110 b)6120 c)6130 d)6140	polygon a)point b)point c)point d)point	On, symbol's stroke, fill Off, fill or green	<p>line weight 0.1</p> 	(75m x 75m or more) a)Broadleaf wood, b)Conifer and Broadleaf woods, d)Poplar. This symbol is shown by three kind of object which are green boundary line, tree type symbol, 50% screen surface, and each type of objects respective layer should be created: ie: 6110, 6360, 6360_f.	










Item	No.	Feature Name	Layer No.	Dxf data type	Over print	USLOVNI ZNAK(Symbol)	Description
E) VEGETACIJA Vegetation	158	Aforested area	6370 6370_f a)6110 b)6120 c)6130 d)6140	polygon a)point b)point c)point d)point	On. symbol's stroke, fill Off. fill of green	<p>line weight 0.1</p> <p>30% screen</p>	75m x 75m or more a)Broadleaf wood, b)Conifer, c)Conifer and Broadleaf woods, d)Poplar. This symbol is shown by three kind of object which are green boundary line, tree type symbol, 50% screen surface, and each type of objects respective layer should be created: ie: 6110, 6370, 6370_f.
	159	Aforested area of young seeding	6380 6380_f	polygon	On. stroke	<p>line weight 0.1</p> <p>30% screen</p>	75m x 75m or more Used pattern is 6380 from swatch library. This symbol is shown by two kind of object which are green boundary line, pattern 6380 surface or rowed symbols, and each type of objects respective layer should be created: 6380, 6380_f.
	160	Bush	6390 6390_f	polygon	On. stroke	<p>line weight 0.1</p>	75m x 75m or more This symbol is shown by two kind of object which are green boundary line, pattern 6380 surface or rowed symbols, and each type of objects respective layer should be created: 6390, 6390_f.
	161	Reed	6150	point	On. stroke		75m x 75m or more Used pattern is 6150 from swatch library.
	162	Isolated tree that becomes landmark	a)6160 b)6170	point	On. stroke, fill	<p>line weight 0.1</p>	a)deciduous b)coniferous
	163	Trees	a)6180 b)6190	point	On. stroke, fill	<p>line weight 0.1</p>	a)tree b)shrub
	164	Indistinct borderline (Transition belt between forest and sparse tree & shrub)	6210	line	On. stroke	<p>line weight 0.1</p>	
	165	Hedge	6220	line	On. stroke	<p>line weight 0.1</p>	
	166	Aforestation belt (defense woods belt)	6230	line	On. stroke	<p>line weight 0.1</p>	







Item	No.	Feature Name	Layer No.	Dxf data type	Over print	USLOVNI ZNAK(Symbol)	Description	
E) VEG-ETACIJA Vegetation	167	Vegetation boundaries	5410	line	On. stroke	 line weight 0.1		
	168	Index contour line (50m interval)	7110	line	On. stroke	 line weight 0.2	Used font is Swis721 Lt BT Light Italic its point 4.5pt. 50 Elevation value for Contour line	
	169	Intermediate contour line (10m interval)	7120	line	On. stroke, text	 line weight 0.1	Used font is Swis721 Lt BT Light Italic its point 4.5pt.	
	170	Supplementary contour line (5m interval)	7130	line	On. stroke, text	 line weight 0.1	Used font is Swis721 Lt BT Light Italic its point 4.5pt.	
	171	Auxiliary contour line (2.5m interval)	7140	line	On. stroke, text	 line weight 0.1	Used font is Swis721 Lt BT Light Italic its point 4.5pt.	
	172	depressions	a)7150 b)7160 c)7170 d)7180	line	On. stroke			
	173	Isobath (2m)	7210	line	On. stroke	 line weight 0.1		
	174	Isobath (5m)	7220	line	On. stroke	 line weight 0.1		
	F) RELJEF Izhopse, izbata Contour line, Isobath							

Item	No.	Feature Name	Layer No.	Dxf data type	Over print	USLOVNI ZNAK(Symbol)	Description
F) RELJEF izohipse, izbata Contour line, Isobath	175	Isobath (10m)	7230	line	On. stroke		
	176	Isobath (20m)	7240	line	On. stroke		
F) RELJEF b) stijene, detalji na zemlji Cliff, Others	177	Glacier, exsample for map representation	7250	line	On. stroke, fill		
	178	Soil cliff	a)7260 b)7265	line	On. stroke		a)small (3m or more in height, 100m or more in length, less than 17.5m in horizontal length of slope) b)large(over than above size)
	179	Rock wall	a)7270 b)7275	line	On. stroke		a)small (3m or more in height, 100m or more in length, less than 17.5m in horizontal length of slope) b)large(over than above size) Fill in swatch Kaist_dot_50.
	180	Mountain stream	a)7280 b)7290	line	On. stroke		a)narrow(25m or more in width and 100m or more in length) b)wide(over than above size)
	181	Depression (sink hole) It is impossible to be shown by contour lines.	7410	line	On. stroke		less than 25m in diameter

Item	No.	Feature Name	Layer No.	Dxf data type	Over print	USLOVNI ZNAK(Symbol)	Description
G) ADMINISTRATIVNE GRANICE, LINIJE Others	182	Tower shaped rock	7420	point	On, stroke, fill	 line weight 0.1	place one point on the center of the rock.
	183	Bare rock	7430	point	On, fill	 0.2 to 0.3 dot	place the symbol as the old map representation.
	184	Gravel ground	7440	polygon	On, fill	 0.1 to 0.2 dot	75m x 75m or more Used pattern is 7440 from swatch library.
	185	Sands	7450	polygon	On, stroke	 0.1 to 0.4 dotted line	75m x 75m or more
	186	International boundaries	181	line	On, stroke	 line weight 0.2, 0.5	
	187	Pillar of international boundaries	182	line	On, stroke	 line weight 0.2	Used font is Times Roman its point 8pt. a)with Number b)without Number
	188	Wooden pillar of international boundaries	183	line	On, stroke	 line weight 0.2	
	189	Signboard of international boundaries	184	line	On, stroke	 line weight 0.2	
	190	International boundaries marker	185	line	On, stroke	 line weight 0.2	
	F) RELJEF b) stijene, detajli na zemlji Cliff, Others						

Item	No.	Feature Name	Layer No.	Dxf data type	Over print	USLOVNI ZNAK(Symbol)	Description
H) KONTROLNE TAČKE Control points others	191	Bench mark	7310	point	On, stroke, fill		Used font is Swis721 Cn BT Italic its point 6.5pt.
	192	Triangulation point	7320 7320_No	point	On, stroke, fill		Used font is Swis721 Cn BT Italic its point 6.5pt.
	193	Triangulation point on a church	7330	point	On, stroke, fill		Used font is Swis721 Cn BT Italic its point 6.5pt.
	194	Triangulation point on a mosque	7335	point	On, stroke, fill		Used font is Swis721 Cn BT Italic its point 6.5pt.
	195	Triangulation point on a synagogue	7340	point	On, stroke, fill		Used font is Swis721 Cn BT Italic its point 6.5pt.
	196	Triangulation point on other structures	a)7350 b)7355 c)7360 d)7365	point	On, stroke, fill	a) b) c) d)	a)on meteorological observatory b)on electric wave tower c)on border pillar d)on chimney Used font is Swis721 Cn BT Italic its point 6.5pt.
	197	Spot height	7370 7370_No	point	On, fill, text		Used font is Swis721 Cn BT Italic its point 6.5pt.
	198	Spot height at a pass	7380 7380_No	point	On, stroke, text		Used font is Swis721 Lt BT Light Italic its point 4.5pt.

Item	No.	Feature Name	Layer No.	Dxf data type	Over print	USLOVNI ZNAK(Symbol)	Description
I) MORE Marine	199	Atoll, more than 2m in depth	5610	polygon	On, stroke		
	200	Atoll, less than 2m in depth	5615	point	On, stroke		
	201	Reefs in the water	5620	point	On, stroke		
	202	Rocks in the water, dried out in low tide level	5625	point	On, stroke		
	203	Reefs	a)5780 b)5630	a)polygon b)point	On, stroke, fill		a)actual size(30mx30m or more) b)minimum size(less than above size)
	204	Port, anchored station	5640	point	On, stroke, fill		
	205	inanchor area	5645	point	On, stroke		
	206	Lighting buoys	5650	point	On, stroke		
	207	Buoys for mooring	5655	point	On, stroke		

Item	No.	Feature Name	Layer No.	Dxf data type	Over print	USLOVNI ZNAK(Symbol)	Description
I) MORE Marine	208	Lights	5660	point	On. stroke		
	209	Hydrant	5665	point	On. stroke		line weight 0.1
	210	Cable house	5670	point	On. stroke		line weight 0.1
	211	Submarine cable	5710	line	On. stroke		line weight 0.1
	212	Slopes at the wharf	5715	line	On. stroke		line weight 0.1
	213	Innavigable area	5720	line	On. stroke		line weight 0.1

Item	No.	Feature Name	Layer No.	Dxf data type	Over print	USLOVNI ZNAK(Symbol)	Description
I) MORE Marine	214	a) Breakwater with anchorage	a) 5725	a) line	On. stroke		
		b) Breakwater with water protection brock	b) 5730	b) line			
		c) Breakwater without water protection brock	c) 5735	c) line			
		d) Breakwater (small)	d) 5740	d) line			
		e) Pier (large)	e) 5745	e) line			
		f) Pier and breakwater (small)	f) 5750	f) line			
		g) Wooden pier	g) 5755	g) line			
		h) Stone pier	h) 5760	h) line			
		i) Wharf	i) 5765	i) line			
		j) Anchorage	j) 5770	j) line			
	215	Dock with equipped moorage	5775	line	On. stroke	 line weight 0.1	
	216	perious waters aera	5780	polygon	On. stroke		
	217	Spillways and building slip	5790	line	On. stroke		

Specifications
on
Computer Systems

Specifications on Computer Systems

JICA installed two sets of computer system for digital mapping and GIS operation in BiH in March 2004 for the technology transfer sessions. One set was installed at JP Geodetski Zavod in Sarajevo and the other at the GIS Department of Republic Administration for Geodetic and Real Property Affairs in Bijeljina.

With these systems, the Study Team conducted technology transfer sessions at the both places in May and June 2004.

The main objects of this system are digital photogrammetry, digital plotting and editing, digital map symbolization and GIS operation.

This volume here shows the detail of specifications of the system and the system diagram.

Table S4 - 1 Specifications of Computer Systems for Digital Mapping and GIS (Computer)

	Description	Quantity
1.	<p>Digital Photogrammetric Workstation 2xSingle Intel® Xeon™ Processor 2.66GHz 1GB (2X512MB DIMM) 266MHz DDR ECC SDRAM Memory 120GB (7,200 rpm) ATA/100 IDE Hard Drive with DataBurst Cache™ 3.5 inch 1.44MB Floppy Drive 32x DVD-ROM/CD-RW Combo Drive + 48x CD-ROM Drive ATI Fire card to be replaced by 3Dlabs Wildcat IV 7110 card Integrated AC'97 Full-Duplex Audio Integrated Intel Pro/1000 MT Ethernet Adapter (10/100/1000Mbps) Enhanced Quietkey™ (Spacesaver) keyboard Mouse (Scrolling Wheel, 2 Buttons, USB or PS/2 Interface) 2x21" (19.8 VIS) Stereo capable monitor with at least 120 Hz refresh rate at 1280X1024 resolution Microsoft® Windows® XP Professional or Windows2000 Professional with latest Service Pack Antivirus Software</p>	2

Table S4 - 2 Specifications of Computer Systems for Digital Mapping and GIS (Software)

	Description	Quantity
2.	<p>Digital Stereo Plotter & Automatic DTM generation Software <u>Digital Stereo Plotter</u> Working with CADsystem, includes Capture NT for interactive data capture and Color Superimposition, with 3D cursor, handwheel and footdisk, with active or passive stereo glasses with, stereo graphic adapter</p> <ul style="list-style-type: none"> • Projects for aerial, close range, satellite, IFSAR, and orthophoto imagery • Subpixel functionality • Subpixel functionality • Frame sequential imaging • Compatibility with color or grayscale images • Ability to display color as grayscale • Project-based user interface • Active project overview • Real-time panning and zooming • On-the-fly epipolar re-sampling • Auto interior/auto relative orientations • Import third-party aero triangulation results • Stereo SUPER/IMPOSITION of vectorized 3D data 	2

	Description	Quantity
	<ul style="list-style-type: none"> • Stereo SUPER/IMPOSITION clip scope • Stereo model bird-eye view • Stereo close-up view • Customizable toolbars and CAD buttons • 3 panning modes • 3 viewing modes • OpenGL for image rendering • User-definable cursors • Snap and align - to ground function • File import wizard • DEM terrain following • CAD command view and CAD tool bar <p><u>Automatic DTM generation Software</u></p> <ul style="list-style-type: none"> • 3D visualization and editing <ul style="list-style-type: none"> - Stereoscopic pre-processing, e.g. breakline and cut-out area capturing - DTM editing capability - Stereoscopic post-processing, e.g. quality control, elevation shifting • Extremely dense DTM by using feature-based matching techniques • Automatic adaptive DTM grid width depending on the surface curvature • Handling of poorly textured areas by auto-optimization of adaptive parameter settings • Elimination of outliers, e.g. trees, houses, by robust finite element interpolation • Internal quality control • Consideration of pre-measured morphological data (break-lines, exclusion areas, borderlines) • Several DTM exchange formats • Automatic interior orientation <ul style="list-style-type: none"> - Reduce human operator interactions - Automatic detection of fiducial marks (RMK, LMK, LEICA) • On-line epipolar image patches and on-line interest data on-demand <ul style="list-style-type: none"> - No extra interactive processing step - Necessary disk capacity reduced, no intermediate storage - More efficient parameter definition 	
3.	<p>Ortho-photo generation for aerial film and digital cameras & Automatic generation of seamless ortho-photo mosaic</p> <p><u>Ortho-photo generation for aerial film and digital cameras</u></p> <ul style="list-style-type: none"> • Automated processing of single images • Automated processing of aerial image blocks • Generation of ortho-photos in a pre-set frame • Flexible definition of optimal ortho areas • On-the-fly DTM generation from ASCII data • Automatic, semi-automatic, and manual interior orientation • Import of area of interest • Improved handling of break-lines and break-lines below bridges for true-ortho generation • Generation and display of contour lines • Optional handling of radial distortion parameters • Source image types: <ul style="list-style-type: none"> - scanned images of aerial frame cameras - digital frame cameras • Input image formats: <ul style="list-style-type: none"> - TIFF (scanlined/ tiled /JPEG) - ers, ecw (ER Mapper) • Orientation data import from/via <ul style="list-style-type: none"> - MATCH-AT/T, in BLOCK, PATB, DAT/EM Summit, PHOREX2, Z/I project, Aerosys, Bingo, BLUH, MMH850, ISM/DIAP and more • import of complete project file or interior and exterior orientation read from separate files • DTM data import (binary): 	2

	Description	Quantity
	<ul style="list-style-type: none"> - SCOP, GeoTIFF, TiffWorld (tfw) - ers, ecw (ER Mapper) • DTM data import (ASCII): <ul style="list-style-type: none"> - XYZ mass points & break/form lines - DXF files - import of multiple raw data files per project • Output image formats: <ul style="list-style-type: none"> - GeoTiff, TiffWorld (tfw) <p><u>Automatic generation of seamless ortho-photo mosaics</u></p> <ul style="list-style-type: none"> • Automatic single image correction <ul style="list-style-type: none"> - Removal of solar reflection - Dodging algorithms to reduce lens vignetting effects - Balancing of intensity and color variation • Usage of color map (LUT) files • Color, brightness and contrast editor for image enhancements • Automatic mosaic color balancing, analysis and adjustment of color and intensity characteristic of adjust images, smooth and consistent intensity and color properties across the entire mosaic • Automatic seam line detection • Manual seam line definition and editing • Seam polygon import/export • Automatic mosaic generation • Supported input formats: <ul style="list-style-type: none"> - GEOtiff - Tiff World (tfw) - Vision RPT - Ers • Supports batch processing • Enhanced editing facilities 	
4.	Seam line editor for seamless ortho-photo mosaic	2
5.	<p>Program for Aerial Triangulation</p> <p>Bundle block adjustment with consideration of airborne GPS data, unrestricted block size</p> <p><u>Adjustment engine</u></p> <ul style="list-style-type: none"> • Sparse matrix technology • Bandwidth minimization • Reduced normal equation • Free net adjustment • Support of GPS and IMU data <p><u>Statistical information</u></p> <ul style="list-style-type: none"> • Internal and external reliability values for all observation and unknowns. • Traditional values like residuals , RMS and standard deviations • Detection of sensitivity of blocks against an undetected gross error and its possible influence • All information graphically displayed. <p><u>Graphic display</u></p> <ul style="list-style-type: none"> • Block visualization • Inspect your data in 3D(zoom, pan and rotate), optional. • Sophisticated analysis and classification of results. • Color-coding of symbols reporting specified quality criteria. <p><u>Operating systems</u></p> <ul style="list-style-type: none"> • Windows NT/2000/XP <p>influence of the undetected blunders on the result, empirical values</p>	2
6.	CAD Software	4

Table S4 - 3 GIS & Digital Map Editing System (Personal computers)

#	Description	Quantity
1.	<p>Desktop PC Intel Pentium4 2.4 GHz Intel 845G chipset 1GBMB 266MHz non-ECC DDR RAM memory (2x512MB) 120GB ATA-100 (7200 rpm) hard disk 3.5" (1.44MB) floppy disk Combo Drive 8x DVD/ 24x CDRW Intel Extreme graphics 48MB shared memory Integrated 16-bit audio (SoundBlaster Live!™) Intel Pro/1000MT network adapter (10/100/1000Mbps) Enhanced Quietkey™ (Spacesaver) keyboard Mouse (Scrolling Wheel, 2 Buttons, USB or PS/2 Interface) Microsoft Windows XP Professional ANTIVIRUS SOFTWARE 21" ULTRASCAN MONITOR Microsoft Office XP Professional</p>	8
2.	<p>Notebook PC Intel Pentium 4 1.8GHz 256MB PC266 DDRAM memory 15" XGA TFT DISPLAY (1024 x 768) 40GB ATA 100 HARD DISK Combo Drive 8x DVD/ 24x CDRW 32MB DDR NVIDIA Ge-Force2 Go Video Card NV11 FLOPPY DRIVE 3,5" 56K INTERNAL DAUGHTERCARD MODEM 10/100 Ethernet NIC adapter Integrated 16-bit audio (stereo) 2 USB ports 1 PCMCIA SLOT NORTON ANTIVIRUS 2002 WINDOWS XP Professional EDITION Microsoft Office XP Professional BAG FOR NOTEBOOK</p>	2

Table 1 4 GIS & Digital Map Editing System (Printers)

#	Description	Quantity
3.	Laser printer (A4 Size) prints 19 ppm (letter)/ 18 ppm (A4). 133 MHz processor, 200 x 1200 dpi with 350 sheet input, Parallel USB	2
4.	Toner for Laser Printer	10
5.	Inkjet Printer A3 size, 11/9.5 st/m, LPT+USB	2
6.	Cartridges for Inkjet Printer Black Cartridge Cyan Cartridge Magenta Cartridge Yellow Cartridge	50 50 50 50

Table S4 - 5 GIS & Digital Map Editing System (Plotters)

#	Description	Quantity
7.	Color inkjet Plotter (A0 size) hard disk,96 MB memory, HP-GL/2 CALS,ADI and Windows drivers internal Network card, USB and parallel connection, Stand & Bin, Roll Feeder	2
8.	Ink Cartridges for Plotter Black Cartridge Cyan cartridge Magenta cartridge Yellow cartridge	50 50 50 50
9.	Printer head for Plotter Printer heads, Black Printer heads, Cyan Printer heads, Magenta Printer heads, Yellow	4 4 4 4
10.	Paper for plotter	20

Table S4 - 6 GIS & Digital Map Editing System (Scanner)

#	Description	Quantity
11.	Flatbed scanner (A4 size) 1200 x 1200 dpi, 48bit USB 2.0 high speed Windows 98,2K,Me,XP, 9.0/10.0 Scan, Copy, E-mail	4

Table S4 - 7 GIS & Digital Map Editing System (Others)

#	Description	Quantity
12.	Network Hub (16 port)	2
13.	UPS	10
14.	Network cable	2

Table S4 - 8 GIS & Digital Map Editing System (Software)

#	Description	Quantity
15.	ArcGIS ArcInfo 8.3	2
16.	ArcGIS ArcEditor 8.3	2
17.	ArcGIS ArcView 8.3	2
18.	ArcGIS Extentions ArcGIS Spatial Analyst ArcGIS 3D Analyst ArcGIS Survey Analyst ArcGIS ArcPress	2 2 2 2
19.	Shipping and Handing for ArcGIS	2
20.	Coordinate conversion software Transforming between coordinate systems, calculating the distance and azimuth between coordinates, and calculating coordinates at a known distance and azimuth from known coordinates. Computing grid convergence, point scale factor, datum shifts, and grid shifts. • Supported Point Database Formats - dBase v.3-5 - Excel XLS v.2-2000 - Lotus123 v.3-5 - ASCII text - SEG P1 - Write to CAD software DWG/DXF R12 • Coordinate Conversion Parameters Including a comprehensive coordinate conversion parameter database that contains most common coordinate systems in use throughout the world. It is possible to customize coordinate parameters. The coordinate conversion database should contains: - over 165 ellipsoids - over 630 datum transformations - over 30 linear units - 7 angular units • Supported Common coordinate systems (minimum) - US State Plane 1927 (both original and exact solutions) - US State Plane 1983 - UTM (Universal Transverse Mercator) North and South zones - Gauss-Kruger Modified, 3TM, and 6TM - XYZ Cartesian Eath-Centered Earth Fixed (ECEF) - New Zealand Map Grid - Grids for Argentina, Australia, Austria, Bahrain, Belgium, Borneo, Columbia, Cuba, Egypt, England, France, Ghana, Greece, India, Iraq, Ireland, Italy, Japan, Minnesota, Netherlands, New Brunswick, New Zealand, Nigeria, Peru, Phillipines, Qatar, Quebec, Rumania, Veracruz, and many more. • Supported Map Projections (minimum) - Albers Equal-Area Conic - Azimuthal Equal Area - Azimuthal Equidistant - Belgium variant of Lambert Conformal Conic - Bonne - Cassini - Double Stereographic - Equal-Area Cylindrical - Equidistant Conic - Equidistant Cylindrical - European Stereographic - Gnostic - Hotine Oblique Mercator (Rectified Skew Orthomorphic - with the Skew Angle parameter) - Hungarian National System (EOV) - IMW Polyconic	2

#	Description	Quantity
	<ul style="list-style-type: none"> - Lambert Conformal Conic (1 parallel) - Lambert Conformal Conic (2 parallel) - Mercator - Miller Cylindrical - Mollweide - Orthographic - Polar Azimuthal - Equal Area - Polar Azimuthal Equidistant - Polar Stereographic - Polyconic - Robinson - Sinusoidal - Space Oblique Mercator - Stereographic - Stereographic 70 - Swiss Oblique Mercator - Transverse Mercator (Gauss-Kruger) - Two-Point Fit (a special polynomial projection) - Van der Grinten 1 • Supported Datum Transformations <ul style="list-style-type: none"> - Molodensky - Bursa/Wolfe - DMA MRE - NADCON - HPGN - Canadian National Transformation V2 	
21.	<p>Raster image georeferencing, reprojection, tiling and mosaicing software</p> <ul style="list-style-type: none"> • Easily georeference images by interactively selecting reference points • Multiple view windows enable rapid reference point selection within source images. • Creates industry standard referencing files (GeoTIFF, Mapinfo Table (TAB) and ESRI World (TFW, WLD, JGW)) • Transfer control points directly from GIS software (ArcView, MapInfo, AutoCAD, and MicroStation map files) • A production proven automatic reference point selection feature accelerates the registration of maps with regular grid lines • Supported image formats: <ul style="list-style-type: none"> - MrSID (read only) - BIL (read only) - DOQQ (read only) - ECW (read only) - TIFF (including GeoTIFF) - Windows Bitmap - JPEG - BSB Chart (read only) - ADRG (read only) - CADRG (read only) - PNG • Supported Image Referencing <ul style="list-style-type: none"> - GeoTIFF - ESRI world file - MapInfo TAB file - BSB KAP file - ADRG and CADRG • Supported Image Transformation Models 	2

#	Description	Quantity
	<p>(Image pixel to reference coordinate system transformation.)</p> <ul style="list-style-type: none"> - Affine - 1st order polynomial - 2nd order polynomial <p>• Coordinate Conversion Parameters</p> <p>Including a comprehensive coordinate conversion parameter database that contains most common coordinate systems in use throughout the world. It is possible to customize coordinate parameters. The coordinate conversion database should contains :</p> <ul style="list-style-type: none"> - over 165 ellipsoids - over 630 datum transformations - over 30 linear units - 7 angular units <p>• Supported Common coordinate systems (minimum)</p> <ul style="list-style-type: none"> - US State Plane 1927 (both original and exact solutions) - US State Plane 1983 - UTM (Universal Transverse Mercator) North and South zones - Gauss-Kruger Modified, 3TM, and 6TM - XYZ Cartesian Eath-Centered Earth Fixed (ECEF) - New Zealand Map Grid - Grids for Argentina, Australia, Austria, Bahrain, Belgium, Borneo, Columbia, Cuba, Egypt, England, France, Ghana, Greece, India, Iraq, Ireland, Italy, Japan, Minnesota, Netherlands, New Brunswick, New Zealand, Nigeria, Peru, Phillipines, Qatar, Quebec, Rumania, Veracruz, and many more. <p>• Supported Map Projections (minimum)</p> <ul style="list-style-type: none"> - Albers Equal-Area Conic - Azimuthal Equal Area - Azimuthal Equidistant - Belgium variant of Lambert Conformal Conic - Bonne - Cassini - Double Stereographic - Equal-Area Cylindrical - Equidistant Conic - Equidistant Cylindrical - European Stereographic - Gnostic - Hotine Oblique Mercator (Rectified Skew Orthomorphic - with the Skew Angle parameter) - Hungarian National System (EOV) - IMW Polyconic - Lambert Conformal Conic (1 parallel) - Lambert Conformal Conic (2 parallel) - Mercator - Miller Cylindrical - Mollweide - Orthographic - Polar Azimuthal - Equal Area - Polar Azimuthal Equidistant - Polar Stereographic - Polyconic - Robinson - Sinusiodal - Space Oblique Mercator - Stereographic - Stereographic 70 - Swiss Oblique Mercator - Transverse Mercator (Gauss-Kruger) 	

#	Description	Quantity
	<ul style="list-style-type: none"> - Two-Point Fit (a special polynomial projection) - Van der Grinten 1 • Supported Datum Transformations <ul style="list-style-type: none"> - Molodensky - Bursa/Wolfe - DMA MRE - NADCON - HPGN - Canadian National Transformation V2 	
22.	<p>Map file conversion tool for Windows with on-the-fly map reprojection</p> <ul style="list-style-type: none"> • Supported Map file formats: <ul style="list-style-type: none"> - AutoCAD DWG/DXF through R2000 - ESRI Shape - MapInfo TAB - MapInfo MIF - Microstation DGN (read only) • Coordinate Conversion Parameters Including a comprehensive coordinate conversion parameter database that contains most common coordinate systems in use throughout the world. It is possible to customize coordinate parameters. The coordinate conversion database should contains : <ul style="list-style-type: none"> - over 165 ellipsoids - over 630 datum transformations - over 30 linear units - 7 angular units • Supported Common coordinate systems (minimum) <ul style="list-style-type: none"> - US State Plane 1927 (both original and exact solutions) - US State Plane 1983 - UTM (Universal Transverse Mercator) North and South zones - Gauss-Kruger Modified, 3TM, and 6TM - XYZ Cartesian Eath-Centered Earth Fixed (ECEF) - New Zealand Map Grid - Grids for Argentina, Australia, Austria, Bahrain, Belgium, Borneo, Columbia, Cuba, Egypt, England, France, Ghana, Greece, India, Iraq, Ireland, Italy, Japan, Minnesota, Netherlands, New Brunswick, New Zealand, Nigeria, Peru, Philippines, Qatar, Quebec, Rumania, Veracruz, and many more. • Supported Map Projections (minimum) <ul style="list-style-type: none"> - Albers Equal-Area Conic - Azimuthal Equal Area - Azimuthal Equidistant - Belgium variant of Lambert Conformal Conic - Bonne - Cassini - Double Stereographic - Equal-Area Cylindrical - Equidistant Conic - Equidistant Cylindrical - European Stereographic - Gnostic - Hotine Oblique Mercator (Rectified Skew Orthomorphic - with the Skew Angle parameter) - Hungarian National System (EOV) - IMW Polyconic - Lambert Conformal Conic (1 parallel) - Lambert Conformal Conic (2 parallel) - Mercator - Miller Cylindrical 	2

#	Description	Quantity
	<ul style="list-style-type: none"> - Mollweide - Orthographic - Polar Azimuthal - Equal Area - Polar Azimuthal Equidistant - Polar Stereographic - Polyconic - Robinson - Sinusoidal - Space Oblique Mercator - Stereographic - Stereographic 70 - Swiss Oblique Mercator - Transverse Mercator (Gauss-Kruger) - Two-Point Fit (a special polynomial projection) - Van der Grinten 1 • Supported Datum Transformations <ul style="list-style-type: none"> - Molodensky - Bursa/Wolfe - DMA MRE - NADCON - HPGN - Canadian National Transformation V2 	
23.	<p>Image-editing Software</p> <ul style="list-style-type: none"> • Powerful color correction tools • Removable flaws while preserving tonality and texture • Changing to various edit modes in a moment, such as gray scale, a double tone, an index color, RGB and CMYK. • Tools to identify out-of-gamut color before printing 	2
24.	<p>Vector graphics software</p> <ul style="list-style-type: none"> • Support for a wide range of file formats • Swatches palette to store custom colors and patterns • Editable object and layer effects • Transformation tools to resize, rotate, reflect, and shear objects 	4
25.	<p>Delivery cost for Equipments</p> <ul style="list-style-type: none"> • Develivey cost to Sarajevo for all equipments • Delivery cost from Sarajevo to Bijeljina for half equipments 	1 1
26.	<p>Installation</p> <ul style="list-style-type: none"> • Setting up Degital Mapping System, including installment of the softwares into the hardwares 	1

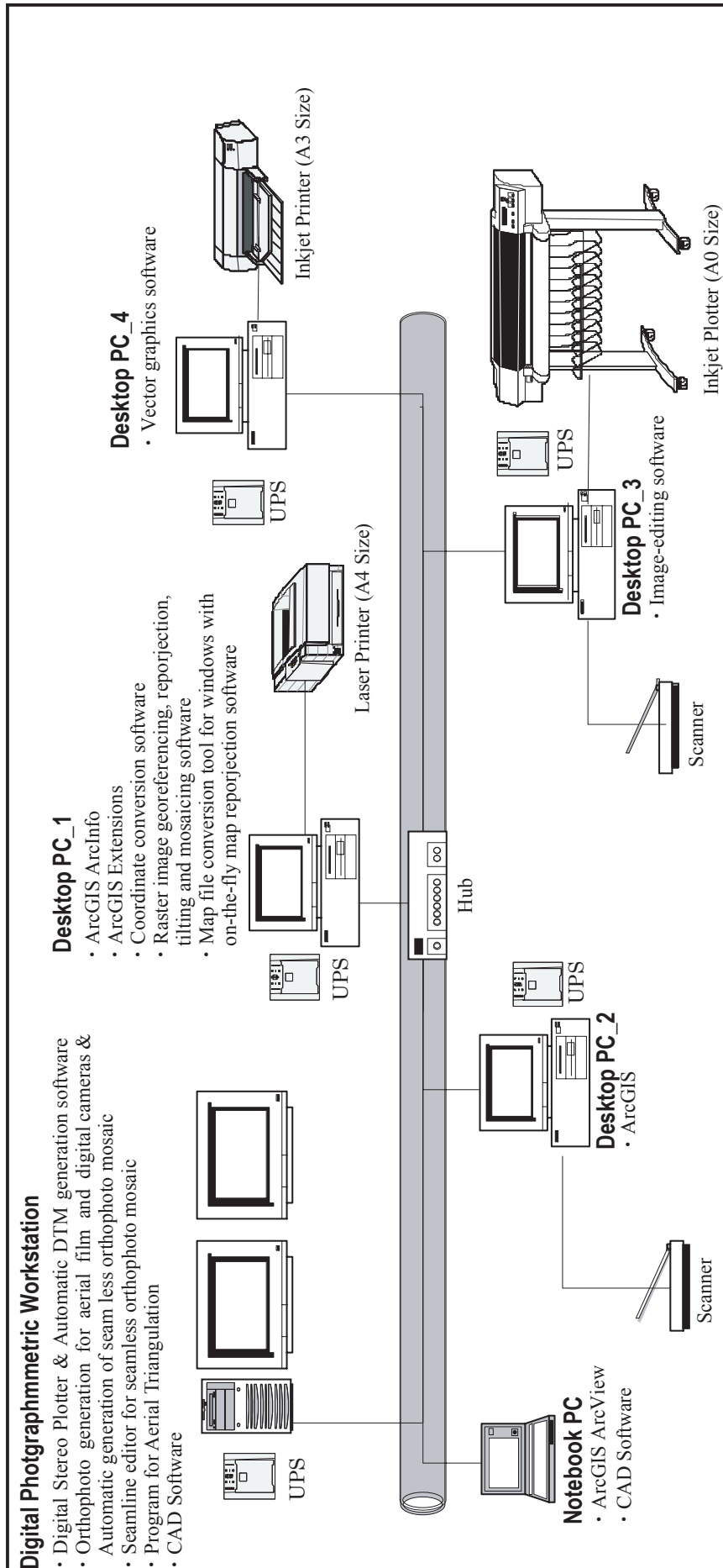


Figure 2 - 17 System Digagram

