Polarized Electron Source

			JLC	NLC	notes:
Energy	E	keV	150	120	
Energy Spread	dE/E	%	< 1	< 1	Intra-pulse variation
Single Bunch sigma E	sE/E	%	0.2	< 1	
Emittance (edge)		10^-6m-rad	30	5	
Bunch Length	dt	ps, FWHM	700	700	
Particles/Bunch	nb	10^10	2.0	2.9	
Pop. Uniformity	dnb/nb	%	1	<0.5	
Number of Bunches	Nb		95	95	
Bunch Spacing		ns	2.8	2.8	
Repetition Rate		Hz	150	120	
Polarization		%	85	80	

Thermionic Electron Source

			JLC	NLC	
Energy	E	keV	200	120	
Energy Spread	dE/E	%	0.5	< 1	long-term HV pulse stability
Single Bunch sigma E	sE/E	%	0.2	< 1	short-term HV pulse stability
Emittance (edge)		10-6m-rad	30	5	
Bunch Length	dt	ps	1000	700	
Particles/Bunch	nb	10^10	1	2.9	
Pop. Uniformity	dnb/nb	%	1	<0.5	beam pulse flatness
Number of Bunches	Nb		95	95	
Bunch Spacing		ns	2.8	2.8	
Repetition Rate		Hz	150	120	

KEK - SLAC Injection system parameters version date: 1/29/99

Bunching system

			JLC	NLC	notes:
Energy	E	MeV	80	80	
Energy Spread	dE/E	%	<1	< 1	better than SLC & ATF
Single Bunch sigma E	sE/E	%	<1	< 1	
Emittance		10^-6m-rad	100	45	
Bunch Length	dt	ps	20 (85% beam)	17.5 (fwhm)	
Particles/Bunch	nb	10^10	1.4	2.0	
Pop. Uniformity, sn	dnb/nb	%	1	<0.5	
Number of Bunches	Nb		95	95	
SHB frequency		Mhz	357	714	
Bunch Spacing	Tb	ns	2.8	2.8	
Repetition Rate	R	Hz	150	120	

Positron Source

Target

			JLC	NLC	notes:
Energy	E	GeV	10	6.2	
Emittance		10^-6m-rad	<100	100	
Bunch Length	dt	ps, FWHM	20	17.5	
Particles/Bunch	nb	10^10	0.7	2	
Pop. Uniformity	dnb/nb	%		<0.5	
Number of Bunches	Nb		95	95	
Beam radius		mm rms	1.2	1.6	
beam power/area	NGeV/mm^2, 10^12		1.5	1.5	< 2 (ZDR p93)
tgt power/volume	NGeV/RL*mm^2, 10^10		8.1	5.1	< 7 (ZDR p93)
Bunch Spacing		ns	2.8	2.8	
Repetition Rate		Hz	150	120	
Average Beam Power	PB	kW	160	226	
Target thickness	W Re	RL	6	4	
Target power	PT	kW	53	32	

Capture

		JLC	NLC
RF frequency	Mhz	2856	1428
bunch length	ps, FW	tbd	30
final energy	MeV	90	250
capture emittance	m-rad	.003 (rms)	.06 (edge)
energy aperture	MeV	±10	±10
pre-DR acceptance	m-rad	0.027	0.09
e+ capture ratio into linac	#e+ per e-	3.0	2.0
e+ capture ratio into Pre-DR	#e+ per e-	2.0	0.8 = 2.0 *.4

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Linacs

			JLC	NLC
Pol. e- Iniector				
Frequency		Mhz	2856	2856
Energy	E	GeV	1.98	1.98
Energy Spread	dE/E	%	±1	±1
Single Bunch sigma E	sE/E	%	tbd	< 0.5
Emittance		10^-6m-rad	<100	100
Bunch Length	dt	ps, FWHM	20	17.5
Particles/Bunch	nb	10^10	1.4	1.6
Pop. Uniformity	dnb/nb	%	1	<0.5
Number of Bunches	Nb		95	95
Bunch Spacing		ns	2.8	2.8
Repetition Rate		Hz	150	120

			JLC	NLC
Positron drive linac				
Frequency		Mhz	2856	2856
Energy	E	GeV	10	6.22
Energy Spread	dE/E	%	±1	±1
Single Bunch sigma E	sE/E	%	tbd	<0.5
Emittance		10^-6m-rad	<100	100
Bunch Length	dt	ps, FWHM	20	17.5
Particles/Bunch	nb	10^10	0.7	2
Pop. Uniformity	dnb/nb	%	1	<0.5
Number of Bunches	Nb		95	95
Bunch Spacing		ns	2.8	2.8
Repetition Rate		Hz	150	120

			JLC	NLC
Positron Injector linac				
Frequency		Mhz	2856	1428
Energy	E	GeV	1.98	1.98
Energy Spread	dE/E	%	±1	±1
Single Bunch sigma E	sE/E	%	tbd	< 1.2
Emittance		m-rad	0.003 (rms)	0.06 (edge)
Bunch Length	dz	mm, sigma	tbd	3.7
Particles/Bunch	nb	10^10	1.7	1.6
Pop. Uniformity	dnb/nb	%	1	<1
Number of Bunches	Nb		95	95
Bunch Spacing		ns	2.8	2.8
Repetition Rate		Hz	150	120
Pre-DR acceptance		m-rad	>0.027	0.09
Energy acceptance		%	±2	±1.5

KEK - SLAC ILC Injection beam current comparison

version date 1/28/99

e-/bunch

losses SLAC	losses KEK	Polarized electron side	KEK	SLAC scaled	SLAC design (max)	SLAC design (max)	SLAC scaled	KEK		losses KEK	losses SLAC
						2.9x10^10	2.0x10^10	.0x10^10	e- gun |		
						2.0	1.4	0.7	Buncher |	~30%	30%
						2.0 x2	1.4 x2	0.7 x3	10/6.2 GeV Linac | e+ target		
30%	~30%	e- gun | Buncher	2.0x10^10	1.8x10^10	2.9x10^10	4.0	2.8	2.1	| 1.98 GeV Linac	~20%	
		| 1.98 GeV Linac	1.4	1.2	2.0	4.0	2.8	1.7	| Pre DR	~20%	60%
10%	~10%	| Main DR	1.4	1.2	1.6	1.9	1.1	1.4	| Main DR	~10%	
		| BC1	1.2	1.1			1.1	1.2	| BC1		
		| 8 GeV Linac	1.2	1.1			1.1	1.2	| 8 GeV Linac		
1%	~10%	| Arc							| Arc	~10%	1%
		| BC2	1.1	1.1			1.1	1.1	| BC2		
		|							|		