IGS

APPENDIX

Table A-1.
IGEX-98 Campaign Status – Organizations
October 19, 1998 through April 19, 1999

Acronym	Name	Country	Type of Participation				Point of Contact	E-Mail Address
			Observations		Anal./	Data		
			GLONASS	SLR	Eval.	Center		
	Universidad Nacional de la Plata	Argentina	X				Raul A. Perdomo	perdomo@fcaglp.fcaglp.unlp.edu.ar
	?	Argentina	X				Jose Luis Hormaechea	jlhor@earg.gov.ar
	Universidad Nacional de la Plata	Argentina	X				Claudio Brunini	claudio@fcaglp.fcaglp.unlp.edu.ar
AUSLIG	Australian Survey and Land Information Group	Australia		X			Leigh Dahl	stromlo_slr@netinfo.com.au
AUSLIG	Australian Survey and Land Information Group	Australia	X	X	X	R	Ramesh Govind	ramesh.govind@auslig.gov.au
AUSLIG	Australian Survey and Land Information Group	Australia	X	X	X	R	Martin Hendy	mhendy@auslig.gov.au
AUSLIG	Australian Survey and Land Information Group	Australia	X	X	X	R	John Luck	jluck@auslig.gov.au
	Curtin University of Technology	Australia			X		Mike Stewart	stewart@vesta.curtin.edu.au
DOLA	Dept. of Land Administration	Australia	X				Ken Alexander	ken_alexander@notes.dola.wa.gov.au
	Dept. of Natural Resources, Queensland	Australia	X				Matt Higgins	matt.higgins@dnr.qld.gov.au
NML	National Measurement Laboratory	Australia	X				Peter Fisk	peter.fisk@tip.csiro.au
NML	National Measurement Laboratory	Australia	X				John Thorn	john.thorn@tip.csiro.au
UNSW	University of New South Wales	Australia			X			
	Univ.of Tasmania, Dept. of Surveying & Special Info.	Australia	X				Richard Coleman	ric@topex.surv.utas.edu.au
	Austrian Academy of Sciences	Austria		X			Georg Kirchner	kirchner@fhub.w01.tu-graz.ac.at
	Institute for Space Research	Austria	X				Peter Pesec	peter.pesec@oeaw.ac.at
TU Vienna	Technische Universitat Vienna	Austria	X		X		Robert Weber	rweber@luna.tuwien.ac.at
	University of Innsbruck	Austria	X				Guenter Chesi	guenter.chesie@uibk.ac.at
ORB	Royal Observatory of Belgium	Belgium	X				Carine Bruyninx	c.bruyninx@oma.be
NRCAN	Geodetic Survey of Canada	Canada	X				Pierre Tetrault	pierre@geod.nrcan.gc.ca
	Universidad de Chile, Centro de Estudios Espaciales	Chile	X				Leon Villan	lvillan@tamarugo.cec.uchile.cl
	Chinese Academy of Sciences	China		X			Yang Fumin	shslr@online.sh.cn
	Chinese Academy of Sciences	China		X			Zhao You	ccslr@public.cc.jl.cn
	Chinese Academy of Surveying and Mapping	China		X			Wang Tanquiang	wangtq@sun.ihep.ac.cn
	Kunming Observatory, Chinese Academy of Sciences	China		X			Jiang Chongguo	yozsx@public.km.yn.cn
	State Seismological Bureau	China		X			Tangyong Guo	hbwh@public.sta.net.cn
	Xian Research Institute	China	X				Ziqing Wei	wzqrxi@sein.sxgb.com.cn
KMS	Kort & Matrikelstyrelsen	Denmark	X				Finn Bo Madsen	bm@kms.dk
	Finnish Geodetic Institute, Metsahovi Geodetic Observ.	Finland	X	X			Matti Paunonen	geodeet@csc.fi
BIPM	Bureau International des Poids et Mesures	France	X				Gerard Petit	gpetit@bipm.fr
IGN	Institut National Geographique	France	X		X		Claude Boucher	boucher@ensg.ign.fr
IGN	Institut National Geographique	France				G	Loic Daniel	daniel@ensg.ign.fr
IGN	Institut National Geographique	France	X				Didier Maillard	maillard@ensg.ign.fr
IGN	Institut National Geographique	France	X				Pascal Willis	willis@ensg.ign.fr
ACRI	Analytical and Computational Research, Inc.	France	X		X		Jennifer Haase	jh@acri.fr
CERGA	Centre d'Etudes et de Recherches Geodyn. et Astro.	France		X				
LRBA	Lab. de Recherches Balistiques et Aerodynamiques	France	X				Christelle Vigneau	christelle.vigneau@wanadoo.fr
OCA	Observatoire de la Cote d'Azur	France		X			Jean-Francois Mangin	mangin@obs-azur.fr
OCA	Observatoire de la Cote d'Azur	France	X	X			Francis Pierron	pierron@obs-azur.fr
EPSHOM	Service Hydrograph. et Oceanograph. de la Marine	France	X				Serge Lannuzel	lannuzel@shom.fr
DLR	Deutsche Forschungsanstalt fur Luft und Raumfahrt	Germany	X		X	O	Arne Jungstand	arne.jungstand@dlr.de
DLR	Deutsche Forschungsanstalt fur Luft und Raumfahrt	Germany	X		X		Joerg Hahn	joerg.hahn@dlr.de
ESA	European Space Agency	Germany	X		X	O	Pierluigi Sivestrin	psilvest@estec.esa.nl
ESOC	European Space Operations Center	Germany	X		X		Pelayo Bernedo	pbernedo@esoc.de
GFZ	GeoForschungsZentrum Institute	Germany		X			Reinhart Neubert	neub@gfz-potsdam.de
GFZ	GeoForschungsZentrum Institute	Germany	X		X		Wolfgang Soehne	soeh@gfz-potsdam.de
IfeN	Institut fuer Erdmessung & Nav./University FAF Munich	Germany	X				Gunther Hein	guenter.hein@unibw-muenchen.de
BKG	Bundesamt fur Kartographie und Geodasie	Germany		X			Armin Boer	boer@wettzell.ifag.de
BKG	Bundesamt fur Kartographie und Geodasie	Germany	X	X	X	R	Heinz Habrich	habrich@ifag.de
BKG	Bundesamt fur Kartographie und Geodasie	Germany	X	X	X	R	Wolfgang Schlueter	schlueter@wettzell.ifag.de
BKG	Bundesamt fur Kartographie und Geodasie	Germany		X			Ulrich Schreiber	schreiber@wettzell.ifag.de
HKPU	Hong Kong Polytechnic University	Hong Kong	X				C.H.J. Chao	lschchao@polyu.edu.hk
	Iceland Geodetic Survey	Iceland	X				Ingvar Thor Magnusson	ingvar@lmi.is
NPL	National Physical Laboratory	India	X		X		P. Banerjee	banerjee@csnpl.ren.nic.in
	Stazione Astronomica di Cagliari	Italy		X			Aldo Banni	banni@ca.astro.it
CRL	Communications Research Laboratory	Japan		X			Hiro Kunimori	kuni@crl.go.jp
ENRI	Electronic Navigation Research Institute	Japan	X				Naoki Arai	naoki@enri.go.jp
GSI	Geographical Survey Institute	Japan	X				Tetsuro Imakiire	imq@gsi-mc.go.jp
	Hydrographic Dept., Geodesy & Geophysics Division	Japan		X			Arata Sengoku	asengoku@cue.jhd.go.jp
IPG	Observatoire Volcanologique du Piton de la Fournaise	La Reunion	X				Ph. Kowalski	kowalski@ipgp.jussieu.fr
	University of Technology	Malaysia	X				Mustafa Din Subari	m.subari@fksg.utm.my
	Delft University of Technology	Netherlands	X				Niels Jonkman	n.f.jonkman@geo.tudelft.nl
VSL	NMi Van Swinden Laboratorium	Netherlands	X				Gerrit de Jong	gdejong@nmi.nl
NMA	Norweigian Mapping Authority	Norway	X				Rune Hanssen	rune.hanssen@gdiv.statkart.no
	Astrogeodyn. Obs., Space Res. Ctr., Pol. Acad.of Sci.	Poland	X		X		Jerzy Nawrocki	j.nawrocki@cbk.poznan.pl
	Astrogeodyn. Obs., Space Res. Ctr., Pol. Acad.of Sci.	Poland		X			Stanislaw Schillak	sch@cbk.poznan.pl
	Central Res. Inst. of Geodesy, Aerial Survey., & Carto.	Russia	X				Gleb Demianov	gleb@space.ru
CRIGAC	Central Res. Inst. of Geodesy, Aerial Survey., & Carto.	Russia	X				Vladimir Kaftan	gleb@space.ru
CRIGAC	Central Res. Inst. of Geodesy, Aerial Survey., & Carto.	Russia	X				N. L. Marakenko	gleb@space.ru
CRIGAC	Central Res. Inst. of Geodesy, Aerial Survey., & Carto.	Russia	X				Andrew Mayorov	maan@ipmce.ru
ESRIPRM	E. Siberian Research Inst. for Physico. & Radio. Meas.	Russia	X				Vjacheslav Zalutsky	eopsr@niiftri.irkutsk.ru
INAASAN	Inst. of Applied Astronomy, Russian Acad. of Sciences	Russia	X				Zinovy Malkin	malkin@quasar.ipa.nw.ru

Table A-1. (Continued)

Acronym	Name	Country	Type of Participation				Point of Contact	E-Mail Address
			Observations		Anal./	Data		
			GLONASS	SLR	Eval.	Center		
INASAN	Inst. of Astronomy, Russian Acad. of Sciences	Russia	X				Suriya Tatevian	statev@inasan.rssi.ru
IMVP	Institute of Metrology for Time and Space	Russia	X				Sergei Pushkin	mark@imvp.aspnet.ru
MCC	Mission Control Center	Russia	X		X		Vladimir Glotov	glotov@geozup.msk.ru
MIIGAIK	Moscow State Geodetic University	Russia	X		X		Victor Lobasov	geodrc@glas.apc.org
	Russian Academy of Sciences	Russia		X			Yuri Kokurin	kokurin@fian.crimea.ua
RRIPMD	Russian Res. Inst. for Physico. Meas. "Dalstandart"	Russia	X				Gennady Aprishkin	root@dst.khabarovsk.ru
	Russian Space Agency	Russia	X				N. L. Marakenko	gleb@space.ru
	Science Research Inst. for Precision Device Engineering	Russia		X			Natalia Parkhomenko	natali@ricimi.msk-su
	CSIR/National Metrology Laboratory	South Africa	X				Louis Marais	elmarais@csir.co.za
	South African Astronomical Observatory	South Africa	X				P. A. H. Fourie	pah@saao.ac.za
	National Land Survey, SWEPOS Operational Center	Sweden	X				None	swepose@lmv.lm.se
	Onsala Space Observatory	Sweden	X		X		Jorgen Borjesson	ajb@oso.chalmers.se
AIUB	Astronomical Institute, University of Berne	Switzerland	X	X			Werner Gürtner	gurtner@aiub.unibe.ch
AIUB	Astronomical Institute, University of Berne	Switzerland	X				Tim Springer	springer@aiub.unibe.ch
CODE	Center for Orbit Determination in Europe	Switzerland			X		Markus Rothacher	markus.rothacher@aiub.unibe.ch
	Tahiti Geodetic Observatory, University of Pacifique	Tahiti		X			Oliver Charade	charade@ufp.pf
NCKU	National Cheng Kung University	Taiwan	X		X		Chung-Liang Tseng	tseng@sparc3.sv.ncku.edu.tw
NCKU	National Cheng Kung University	Taiwan				O	Ting-To Yu	yutt@mail.ncku.edu.tw
NFTL	National Standard Time and Frequency Laboratory	Taiwan	X				Kun-Yuan Tu	kytu@ms.chttl.com.tw
	Crimean Astronomical Observatory	Ukraine		X			Lazar Shtirberg	lazar@crao.crimea.ua
	Racal	United Kingdom	X				Gordon Johnston	gjohnston@racal-survey.co.uk
	Racal	United Kingdom	X				Peter Shardlow	shardlow@racal-survey.co.uk
	NERC Satellite Laser Ranging Facility	United Kingdom	X	X	X		Roger Wood	rw@gxvf.rgo.ac.uk
	University of East London	United Kingdom			X		Marek Ziebart	m.k.ziebart@uel.ac.uk
	University of Leeds, CAA- Inst. of Satellite Navigation	United Kingdom	X		X		David Lowe	d.lowe@elec-eng.leeds.ac.uk
NPL	National Physical Laboratory	United Kingdom	X				Jon Clarke	jdc@npl.co.uk
	3S Navigation	United States	X				Jacques Beser	jbeser@aol.com
	Lure Observatory	United States		X			Dan O'Gara	ogara@lure.ifa.hawaii.edu
MIT/LL	MIT/Lincoln Laboratory	United States	X				Brian Burke	bpburke@ll.mit.edu
MIT/LL	MIT/Lincoln Laboratory	United States	X				Pratap Misra	misra@ll.mit.edu
	McDonald Observatory, University of Texas	United States	X	X	X		Steve Nerem	nerem@csr.utexas.edu
	McDonald Observatory, University of Texas	United States	X	X	X		Jerry Wiant	jrw@astro.as.utexas.edu
NASA	National Aeronautics and Space Administration	United States	X				Tom Clark	clark@tomcat.gsfc.nasa.gov
NASA	National Aeronautics and Space Administration	United States		X			Maceo Blount	m7mgr@thorin.atsc.allied.com
NASA	National Aeronautics and Space Administration	United States		X			Dave Carter	dcarter@eib1.gsfc.nasa.gov
NASA	National Aeronautics and Space Administration	United States		X			Gery Gebet	m4mgr@slral2.atsc.allied.com
NASA	National Aeronautics and Space Administration	United States				G	Carey Noll	noll@cddis.gsfc.nasa.gov
NASA	National Aeronautics and Space Administration	United States		X			Vince Noyes	moblas@midwest.com.au
NIMA	National Imagery and Mapping Agency	United States	X				Barbara Wiley	wileyb@nima.mil
USNO	U.S. Naval Observatory	United States	X				Francine Vannicola	fmv@cassini.usno.navy.mil
UNAVCO	University Corporation for Atmospheric Research	United States	X				Barbara Perin	perin@unavco.ucar.edu
UNAVCO	University Corporation for Atmospheric Research	United States	X				Steve Fisher	sfisher@ncar.ucar.edu
	University of Florida	United States	X				Ramesh Shrestha	rshre@ce.ufl.edu
USGS	U.S. Geological Survey	United States	X				Larry Hothem	lhothem@usgs.gov

Notes: **X** indicates participation
For data centers: G=Global, R=Regional, O=Operational

Table A-2. IGEX-98 Campaign Status – GLONASS Receiver Stations (Operational for All or Part of Campaign)
October 19, 1998 through April 19, 1999

Country	Station Location/Name	Station Acronym	Institution	N. Lat.	E. Long.	Receiver		Comments
						Manufacturer	Model	
Antarctica	McMurdo Stn./Crary Science Lab	CRAR	USGS	-77°51'	166°40'	Javad	Legacy GGD	JPS RegAnt CR ant.
Argentina	Rio Grande	RIOZ	GFZ/La Plata University	-53°47'	-67°45'	MAN	NR-R124	24 chan. L1 GPS/GLONASS; MAN antenna
Australia	Brisbane	SUNM	Dept. of Nat. Res., Queensland	-27°29'	153°02'	Javad	Legacy GGD	JPS RegAnt ant.
Australia	Canberra/ Stromlo	STRR	AUSLIG	-35°19'	149°01'	Ashtech	Z18	Ashtech GG CR ant.
Australia	Hobart	HOBR	AUSLIG	-42°48'	147°26'	Ashtech	GG24	Ashtech GG ant.
Australia	Lindfield/Lindfield NML2	LINR	National Measurement Lab.	-33°50'	151°12'	3S Navigation	R100/30T	TSA-100 CR ant.; Cs clock
Australia	Perth/ Bellevue 157	BELR	AUSLIG/DOLA	-31°53'	116°00'	Ashtech	GG24C	Ashtech GG ant.
Australia	Yaragadee/ AU053	YARR	AUSLIG	-29°03'	115°21'	Ashtech	Z18	Ashtech GG CR ant.
Austria	Graz/Graz-Lustbuehel	GRAB	Institute for Space Research	47°06'	15°30'	Ashtech	Z18	Ashtech GG CR ant.
Austria	Innsbruck	IBK1	University of Innsbruck	47°16'	11°21'	Ashtech	GG24	
Austria	Mattersburg	MTBG	TU Vienna	47°44'	16°24'	Ashtech	GG24	
Belgium	Brussels	BRUG	ORB	50°48'	4°22'	3S Navigation	R100/30T	TSA-100 CR ant.; Cs clock;H-maser clockafter 2Fe99; Perm. after campaign
Chile	Santiago	SANG	NIMA, U. de Chile	-33°09'	-70°40'	3S Navigation	R100/40	TECOM ant.; Cs clock
Finland	Metsahovi	METZ	Finnish Geodetic Institute	60°13'	24°24'	Ashtech	Z18	Ashtech GG CR ant.
France	Brest/Brest-EPHOM	BRSG	EPSHOM	48°24'	-4°30'	Martech	Mira 24	12 L1 GPS/12 L1 GLONASS; Ashtech GG L1 ant.;Stn. ID changed from BRST on Day 322/1998
France	Brest/Brest-EPHOM	BRST	EPSHOM	48°24'	-4°30'	Martech	Mira 24	12 L1 GPS/12 L1 GLONASS; Ashtech GG L1 ant.;Stn. ID changed to BRSG on Day 322/1998
France	Grasse/ Caussols	GRAC	OCA/ACRI	43°45'	6°55'	Martech	Mira 24	Ashtech GG ant.;12 L1 GPS/12 L1 GLONASS
France	Sèvres/BIPM	BIPD	BIPM	48°50'	2°13'	3S Navigation	R100/30T	TSA-100 CR ant.; Cs HP5071A clock
France	Vernon	LRBA	LRBA	49°06'	1°30'	Ashtech	Z18	Dorne Marg. CR ant.
Gabon	N'Koltang	NKLG	IGN	0°13'	9°24'	Ashtech	Z18	
Germany	Neubiberg	BLVA	IfEN	48°08'	11°35'	3S Navigation	R101+R100	OLD model receivers;TECOM ant.
Germany	Neustrelitz/ DLR DFD Neustrelitz	NTZ1	DLR	53°20'	13°04'	3S Navigation	R101	TECOM ant.; Rb clock; collocated w/ SNR8100
Germany	Oberpfaffenhofen	DLRA	DLR	48°05'	11°17'	3S Navigation	R100/40T	TSA-100 ant.; H-maser clock
Germany	Koetzting/Wettzell	WTZG	BKG	49°09'	12°53'	3S Navigation	R101 + R100	OLD model receiver; TECOM CR ant.; H-maser clock
Germany	Koetzting/Wettzell	WTZZ	BKG	49°09'	12°53'	Ashtech	Z18	Dorne Marg. CR ant.;Cs clock
Greenland	Thule Airbase	THU2	KMS	76°32'	-68°50'	Ashtech	Z18	Ashtech GG CR ant.
Hong Kong	Hong Kong	HKPU	Hong Kong Polytech. Univ.	22°18'	114°11'	Ashtech	GG24C	
Iceland	Reykjavik	REYZ	BKG/Iceland Geodetic Survey	64°08'	-21°57'	Ashtech	Z18	Ashtech GG CR ant.
India	New Delhi	NPLI	National Physical Laboratory	28°38'	77°10'	3S Navigation	GNSS-300T	
Japan	Mitaka/ Mitaka A Site	MTKA	ENRI	35°41'	139°34'	Ashtech	Z18	Ashtech ant.
Japan	Tsukuba/ Tsukuba A	TSKA	GSI	36°06'	140°05'	Ashtech	Z18	Ashtech ant; Cs clock
Kyrgyzstan	Bishkek	BISZ	GFZ	42°53'	74°36'	MAN	NR-R124	24 chan. L1 GPS/GLONASS
La Reunion	La Reunion	REUN	IGN	-21°12'	55°34'	Ashtech	Z18	Dorne Marg.ant.
Netherlands	Delft	DLFT	Delft Univ. of Technology	51°59'	4°23'	Ashtech	GG24C	
Netherlands	Delft	DLFT	Delft Univ. of Technology	51°59'	4°23'	Javad	Legacy GGD	JPS RegAnt SD ant.
Netherlands	Delft/ VSL-Delft	VSLD	VSL	52°00'	4°23'	3S Navigation	R100/40T	TSA-100 CR ant.; Cs clock
Poland	Borowiec	BORG	Astrogeodyn. Observatory	52°17'	17°04'	3S Navigation	R100/30T	TSA-100 CR ant.;Cs clock;6-chan.GLONASS P;12 chan. L1 GPS/GLONASS C/A
Russia	Ekaterinburg	EKAT	Cent. Res. Inst. of Geod.	57°02'	59°33'	Javad	Legacy	RegAnt ant.
Russia	Irkutsk	IRKG	IMVP	52°13'	104°19'	Trimble	4000SGL	H-maser clock
Russia	Irkutsk	IRKZ	IMVP	52°13'	104°19'	Ashtech	Z18	Ashtech GG L1/L2 ant.; H-maser clock;colocated w/ Stn. IRKG
Russia	Khabarovsk	KHAB	IMVP	48°31'	135°02'	Ashtech	Z18	Ashtech GG L1/L2 ant.; H-maser clock
Russia	Magadan	MAGD	Cent. Res. Inst. of Geod.	59°35'	150°48'	Javad	Legacy	RegAnt ant.
Russia	Mendeleevo	MDVG	IMVP	56°02'	37°13'	Trimble	4000SGL	H-maser clock
Russia	Mendeleevo	MDVZ	IMVP	56°02'	37°13'	Ashtech	Z18	Ashtech GG L1/L2 ant.; colocated w/ Stn. MDVG
Russia	Petropavlovsk-Kamchatskiy	PKST	Cent. Res. Inst. of Geod.	53°05'	158°38'	Javad	Legacy	RegAnt ant.;Rb clock
Russia	Svetloe	SVT3	INASAN, CNIIGAIK	60°32'	29°47'	Javad	Legacy GGD	RegAnt ant.
Russia	Yakutsk	YAKT	Cent. Res. Inst. of Geod.	62°02'	129°41'	Javad	Legacy	RegAnt ant.
Russia	Zvenigorod	ZWEG	MIIGAIK, INASAN	55°42'	36°46'	Ashtech	GG24	colocated w/ Turbo-Rogue
South Africa	Pretoria	CSIR	CSIR/National Metrology Lab.	-25°45'	28°17'	3S Navigation	R100/30T	TSA-100 CR ant.; Cs clock
South Africa	Sutherland	SUTG	GFZ, S. African Astro. Observ.	-32°24'	20°49'	MAN	NR-R124	24 chan. L1 GPS/GLONASS; MAN antenna
Sweden	Kiruna	KR0G	Onsala Space Observatory	67°53'	21°04'	Ashtech	Z18	Dorne Marg.T ant.
Sweden	Maartsbo	MR6G	Onsala Space Observatory	60°36'	17°16'	Ashtech	GG24C	Dorne Marg.T ant.
Sweden	Onsala	OS0G	Onsala Space Observatory	57°24'	11°56'	Ashtech	Z18	Dorne Marg.B ant.; H-maser clock
Sweden	Visby	VS0G	Onsala Space Observatory	57°39'	18°22'	Ashtech	GG24C	Dorne Marg.T ant.

Table A-2. (Continued)

Country	Station Location/Name	Station Acronym	Institution	N. Lat.	E. Long.	Receiver		Comments
						Manufacturer	Model	
Switzerland	Zimmerwald/Zimmerwald GPS87E	ZIMJ	AIUB	46°53'	7°28'	Javad	Legacy GGD	JPS RegAnt SD ant.
Switzerland	Zimmerwald/Zimmerwald GPS97	ZIMZ	AIUB	46°53'	7°28'	Ashtech	Z18	Ashtech GG CR ant.
Taiwan	Taiwan	NCKU	NCKU	23°00'	120°13'	Ashtech (2)	GG24 Surveyor	Marine IV antenna
UK	Herstmonceux	HERP	NERC SLR Facility	50°52'	0°20'	3S Navigation	R100/40	TECOM ant.;Rb clock;12 chan.L1/L2 GLONASS P;12 chan.L1 GPS/GLONASS C/A
UK	Leeds	LDS1	Univ. of Leeds, ESA, ESOC	53°49'	-1°33'	ESA/ISN GNSS	8 chan./2-freq	Cs clock
UK	Leeds	LDS3	Univ. of Leeds, ESA, ESOC	53°49'	-1°33'	Ashtech	GG24	Trimble 4000SLD L1/L2 ant.
UK	Teddington	NPLC	NPL	51°25'	-0°20'	3S Navigation	R100/40T	TECOM ant.; 6 chan. GLONASS P; 12 chan. GPS/GLONASS C/A;H-maser clock
UK	Gr. Yarmouth/Great Yarmouth 2	GTY2	RACAL	52°35'	1°44'	Ashtech	GG24C	
USA	Gainesville	GATR	University of Florida	29°29'	-82°21'	Javad	Legacy GGD	
USA	Greenbelt	GODZ	NASA GSFC	39°01'	-76°50'	Ashtech	Z18	H2 maser clock; AOA choke ring antenna; collocated with IGS stn. GODE
USA	Irvine	3SNA	3S Navigation	33°41'	-117°52'	3S Navigation	R100/40T	TSA-100 antenna; Cs clock
USA	Lexington/ MIT/LL South Lab	SL1X	MIT/Lincoln Lab	42°28'	-71°16'	Ashtech	Z18	2 receivers; Ashtech CR ant.
USA	Ft. Davis/McDonald Observatory	MDOA	Univ. of Texas/Austin	30°41'	-104°01'	Javad	Legacy	JPS RegAnt ant.
USA	Washington, DC	USNX	USNO	38°55'	-77°04'	3S Navigation	R100/30T	TSA-100 CR ant.; H-maser clock

INTERNATIONAL GLONASS EXPERIMENT (IGEX-98) NETWORK

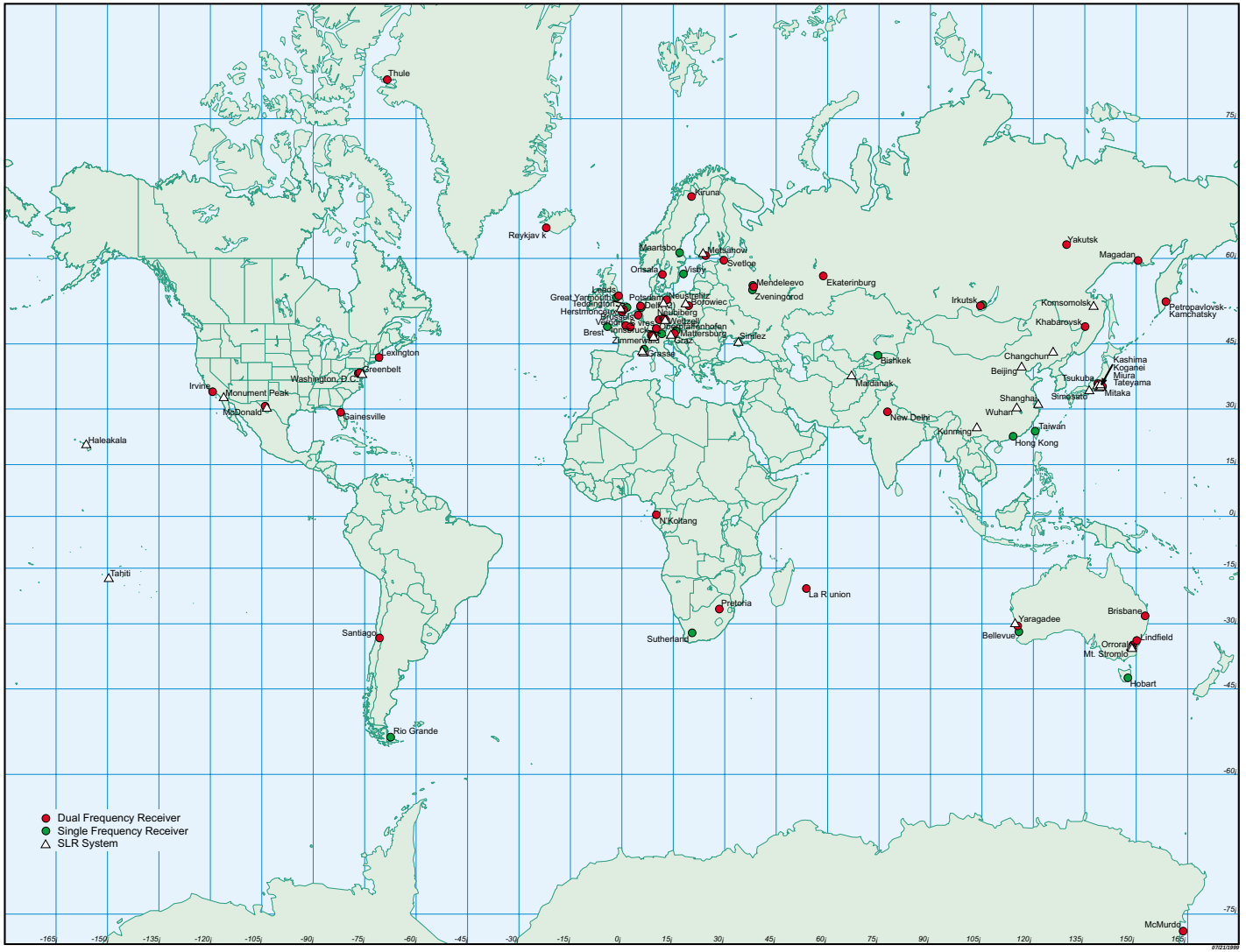

Table A-3. IGEX-98 Campaign Status – Satellite Laser Ranging Stations
(Operational for All or Part of Campaign)
October 19, 1998 through April 19, 1999

Country	Station Location/Name	Station Number	Institution	N. Lat.	E. Long.
Australia	Mount Stromlo	7849	AUSLIG	-35°19'	149°01'
Australia	Orroral	7843	AUSLIG	-35°38'	148°56'
Australia	Yaragadee	7090	AUSLIG	-29°03'	115°21'
Austria	Graz	7839	Austrian Academy of Sciences	47°04'	15°30'
China	Beijing	7249	Chinese Acad. of Survey. & Mapping	39°36'	115°54'
China	Changchun	7237	Chinese Acad. of Sciences	43°50'	125°20'
China	Kunming	7820	Kunming Observ./Chinese Acad. Sci.	25°02'	102°48'
China	Shanghai	7837	Chinese Acad. of Sciences	31°06'	121°12'
China	Wuhan	7236	State Seismological Bureau	30°35'	114°19'
Finland	Metsahovi	7806	Finnish Geodetic Institute	60°13'	24°24'
France	Grasse	7835	OCA/CERGA	43°45'	6°55'
France	Grasse (LLR)	7845	OCA/CERGA	43°45'	6°55'
Germany	Potsdam	7836	GFZ	52°17'	17°05'
Germany	Wettzell	8834	BKG	49°09'	12°53'
Japan	Kashima	7335	CRL	35°57'	140°40'
Japan	Koganei	7328	CRL	35°26'	139°17'
Japan	Miura	7337	CRL	35°05'	139°22'
Japan	Simosato	7838	Hydro. Dept./Geodesy & Geophys. Div	33°34'	135°56'
Japan	Tateyama	7339	CRL	34°35'	139°30'
Poland	Borowiec	7811	Space Res. Ctr./Polish Acad. of Sci.	52°17'	17°05'
Russia	Komsomolsk-Na-Amure	1868	Sci. Res. Inst. for Precision Device Eng	50°52'	136°59'
Switzerland	Zimmerwald	7810	Astronomical Inst./Univ. of Bern	46°53'	6°55'
Tahiti	Papeete	7124	Tahiti Geod. Observ./Univ. of Pacifique	-17°35'	-149°36'
Ukraine	Simeiz	1873	Crimean Astonomical Observatory	44°16'	33°36'
UK	Herstmonceux	7840	NERC SLR Facility	50°52'	0°20'
USA	Greenbelt	7105	NASA	39°01'	-76°50'
USA	Haleakala	7210	Lure Observatory	20°43'	-156°15'
USA	McDonald	7080	McDonald Observ./U. of Texas/Austin	30°41'	-104°01'
USA	Monument Peak	7110	NASA	32°54'	-116°25'
Uzbekistan	Maidanak	1864	Sci. Res. Inst. for Precision Device Eng	38°41'	66°56'

Table A-4. IGEX-98 GLONASS Data Holdings of the CDDIS
October 19, 1998 through April 19, 1999

Mon. Name	Site Name	Country	Receiver Type	Start Date	End Date	No. Days	
BELR	Bellevue	Australia	Ashtech GG24C	23-Nov-98	19-Jan-99	27	
BETR	Bellevue	Australia	Ashtech Z-12 (GPS only)	09-Nov-98	19-Jan-99	15	
BISZ	Bishkek	Kyrgyzstan	MAN NR-R124	16-Nov-98	19-Apr-99	147	
BORG	Borowiec	Poland	3S Navigation R100/30T	19-Oct-98	19-Apr-99	167	*
BRST/G	Brest	France	Ashtech GG24 (Martec)	19-Oct-98	16-Apr-99	156	
SUNM	Brisbane	Australia	Javad Legacy GGD	24-Dec-98	03-Apr-99	90	*
BRUG	Brussels	Belgium	3S Navigation R100/30T	19-Oct-98	19-Apr-99	154	*
DLFT	Delft	The Netherlands	Ashtech GG24C	19-Oct-98	16-Feb-99	120	
			Javad Legacy GGD	23-Feb-99	19-Apr-99	53	*
VSLD	Delft	The Netherlands	3S Navigation R100/40T	21-Oct-98	15-Apr-99	165	*
EKAT	Ekaterinburg	Russia	Javad Legacy	13-Jan-99	04-Feb-99	8	
GATR	Gainesville	USA	Javad Legacy GGD	19-Oct-98	03-Apr-99	120	*
GRAC	Grasse	France	Ashtech GG24C	29-Nov-98	19-Apr-99	119	
GRAB	Graz	Austria	Ashtech Z-18	23-Nov-98	19-Apr-99	115	
GTY1	Great Yarmouth	United Kingdom	Trimble 4000SSI (GPS only)	19-Oct-98	30-Jan-99	97	
GTY2	Great Yarmouth	United Kingdom	Ashtech GG24	19-Oct-98	28-Jan-99	74	
GODZ	Greenbelt	USA	Ashtech Z-18	19-Oct-98	19-Apr-99	170	*
HERP	Herstmonceux	United Kingdom	3S Navigation R100/40	03-Nov-98	19-Apr-99	151	*
HOBR	Hobart	Australia	Ashtech GG24C	18-Nov-98	30-Nov-98	3	
HKPU	Hong Kong	China	Ashtech GG24C	20-Oct-98	29-Oct-98	4	
IBK1	Innsbruck	Austria	Ashtech GG24	19-Oct-98	19-Apr-99	120	
IRKG	Irkutsk	Russia	Trimble 4000SGL	19-Oct-98	10-Apr-99	169	*
IRKZ	Irkutsk	Russia	Ashtech Z-18	19-Oct-98	19-Apr-99	174	*
3SNA	Irvine	USA	3S Navigation R100/40T	19-Oct-98	19-Apr-99	139	
KHAB	Khabarovsk	Russia	Ashtech Z-18	19-Oct-98	20-Mar-99	150	*
KR0G	Kiruna	Sweden	Ashtech Z-18	19-Oct-98	19-Apr-99	170	*
CSN1	Korolev	Russia	Ashtech Z-12 (GPS only)	25-Oct-98	25-Oct-98	1	
REUN	La Reunion	La Reunion	Ashtech Z-18	15-Dec-98	19-Apr-99	64	
LDS1	Leeds	United Kingdom	ESA/ISN GNSS	19-Oct-98	19-Apr-99	181	
LDS2	Leeds	United Kingdom	Trimble 4000SSE (GPS only)	20-Oct-98	19-Apr-99	178	
LDS3	Leeds	United Kingdom	Ashtech GG24EC	19-Oct-98	19-Apr-99	180	
SL1X	Lexington	USA	Ashtech Z-18	19-Oct-98	18-Apr-99	172	
LINR	Lindfield	Australia	3S Navigation R100/30T	19-Oct-98	19-Apr-99	90	*
MR6G	Maartsbo	Sweden	Ashtech GG24C	19-Oct-98	19-Apr-99	177	*
MAGD	Magadan	Russia	Javad Legacy	13-Jan-99	10-Mar-99	54	
MTBG	Mattersburg	Austria	Ashtech GG24C	05-Nov-98	17-Apr-99	137	*
MDOA	McDonald	USA	Javad Legacy	20-Nov-98	19-Apr-99	138	
CRAR	McMurdo	Antarctica	Javad Legacy GGD	26-Dec-98	06-Feb-99	43	
MDVG	Mendeleevo	Russia	Trimble 4000SGL	19-Oct-98	14-Feb-99	118	
MDVZ	Mendeleevo	Russia	Ashtech Z-18	19-Oct-98	19-Apr-99	181	*
METZ	Metsahovi	Finland	Ashtech Z-18	19-Oct-98	19-Apr-99	137	*
MTKA	Mitaka	Japan	Ashtech Z-18	27-Oct-98	19-Apr-99	127	*
STRR	Mt. Stromlo	Australia	Ashtech Z-18	07-Nov-98	19-Apr-99	123	*
NKLG	N'Koltang	Gabon	Ashtech Z-18	13-Feb-99	19-Apr-99	37	
BLVA	Neubiberg	Germany	3S Navigation R100/R101	19-Oct-98	21-Dec-98	10	
NTZ1	Neustrelitz	Germany	3S Navigation R101	19-Oct-98	19-Apr-99	183	*
NTZ3	Neustrelitz	Germany	Rogue SNR-8100 (GPS only)	19-Oct-98	19-Apr-99	183	*
NPLI	New Delhi	India	3S Navigation GNSS-300T	16-Nov-98	26-Nov-98	2	
DLRA	Oberpfaffenhofen	Germany	3S Navigation R100/40T	19-Oct-98	19-Apr-99	132	
OS0G	Onsala	Sweden	Ashtech Z-18	22-Oct-98	18-Apr-99	163	*
PKST	Petropavlovsk-Kamchatskiy	Russia	Javad Legacy	16-Jan-99	14-Feb-99	28	
CSIR	Pretoria	South Africa	3S Navigation R100/30T	19-Oct-98	19-Apr-99	165	*
REYZ	Reykjavik	Iceland	Ashtech Z-18	19-Oct-98	18-Apr-99	85	*
RIOZ	Rio Grande	Argentina	MAN NR-R124	11-Nov-98	19-Apr-99	141	
SANG	Santiago	Chile	3S Navigation R100/40	05-Nov-98	19-Apr-99	156	
BIPD	Sèvres	France	3S Navigation R100/30T	25-Oct-98	18-Apr-99	144	*
SUTG	Sutherland	South Africa	MAN NR-R124	03-Dec-98	19-Apr-99	136	
SVT3	Svetloe	Russia	Javad Legacy GGD	05-Jan-99	07-Feb-99	34	
CK02	Taiwan	Taiwan	Ashtech Z-12 (GPS only)	20-Oct-98	19-Apr-99	125	
NCKU	Taiwan	Taiwan	Ashtech GG24	20-Oct-98	17-Apr-99	117	
NPLB	Teddington	United Kingdom	Ashtech Z-12	27-Nov-98	30-Nov-98	4	
NPLC	Teddington	United Kingdom	3S Navigation R100/40T	21-Oct-98	19-Apr-99	131	
THU2	Thule	Greenland	Ashtech Z-18	10-Nov-98	19-Apr-99	112	*
TSKA	Tsukuba	Japan	Ashtech Z-18	19-Nov-98	19-Apr-99	136	
LRBA	Vernon	France	Ashtech Z-18	21-Oct-98	19-Apr-99	138	
VS0G	Visby	Sweden	Ashtech GG24C	19-Oct-98	19-Apr-99	169	*
USNX	Washington, DC	USA	3S Navigation R100/30T	22-Oct-98	19-Apr-99	166	*
WTZG	Wettzell	Germany	3S Navigation R100/R101	19-Oct-98	19-Apr-99	123	*
WTZZ	Wettzell	Germany	Ashtech Z-18	07-Feb-99	19-Apr-99	68	*
YAKT	Yakutsk	Russia	Javad Legacy	12-Jan-99	07-Mar-99	52	
YARR	Yaragadee	Australia	Ashtech Z-18	20-Oct-98	19-Apr-99	137	*
ZIMJ	Zimmerwald	Switzerland	Javad Legacy GGD	14-Feb-99	19-Apr-99	48	*
ZIMZ	Zimmerwald	Switzerland	Ashtech Z-18	19-Oct-98	19-Apr-99	172	*
ZWEG	Zvenigorod	Russia	Ashtech GG24	28-Oct-98	02-Feb-99	79	
Totals:	74 receivers at 62 sites				station days:	8,354	

Notes: ***** denotes site that continues in operation (as of September 1999)
47 dual frequency, 20 single frequency, and 7 GPS-only receivers

Table A-5.
IGEX-98 SLR Data Holdings of the CDDIS
October 19, 1998 through April 19, 1999

Site Name	Country	Sta.	Number of Passes																		
			GL-62*	GL-64	GL-65*	GL-66*	GL-67	GL-68*	GL-69*	GL-70*	GL-71*	GL-72*	GL-74	GL-75	GL-76	GL-77	GL-79*	GL-80*	GL-81*	GL-82*	Totals
Beijing	China	7249	7	0	0	3	0	6	6	7	6	4	0	0	0	0	0	0	0	0	39
Borowiec	Poland	7811	2	0	0	3	0	1	4	5	5	3	0	0	0	0	3	0	0	0	26
Changchun	China	7237	45	23	8	15	11	37	40	34	36	35	14	20	22	18	27	0	0	1	386
Grasse	France	7835	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Grasse (LLR)	France	7845	66	0	8	77	0	47	60	65	127	82	0	0	0	0	76	0	0	0	608
Graz	Austria	7839	70	8	8	50	0	56	54	64	65	68	4	30	37	43	44	0	0	0	601
Greenbelt	USA	7105	34	0	10	37	0	56	47	49	39	38	0	0	0	0	31	2	13	4	360
Haleakala	USA	7210	29	0	3	44	0	43	18	26	43	18	0	0	0	0	1	0	0	0	225
Herstmonceux	United Kingdom	7840	45	5	5	37	39	50	48	53	48	42	0	0	0	0	41	0	0	0	413
Kashima	Japan	7335	0	0	0	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	4
Koganei	Japan	7328	2	0	0	0	0	2	1	4	6	1	0	0	0	0	1	0	0	0	17
Komsomolsk-na-Amure	Russia	1868	0	0	0	14	0	0	0	0	19	0	0	0	0	0	0	0	0	0	33
Kunming	China	7820	2	1	0	2	0	1	7	5	6	9	0	0	0	1	1	0	0	0	35
Maidanak	Uzbekistan	1864	1	0	0	8	0	8	8	8	12	1	0	1	0	0	5	0	0	0	52
McDonald	USA	7080	27	0	6	39	1	25	27	28	39	22	0	0	0	0	28	0	3	0	245
Metsahovi	Finland	7806	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Miura	Japan	7337	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
Monument Peak	USA	7110	112	0	12	88	0	108	123	117	119	110	0	0	0	0	77	4	15	11	896
Mount Stromlo	Australia	7849	68	0	8	72	0	65	63	68	62	68	0	0	0	0	56	1	4	0	535
Orroral	Australia	7843	7	6	5	7	0	5	9	3	8	0	2	10	7	0	9	0	0	0	78
Potsdam	Germany	7836	11	0	1	9	0	12	19	12	12	17	0	0	0	0	8	0	0	0	101
Shanghai	China	7837	22	0	1	11	5	24	22	22	14	28	0	3	2	2	13	0	0	0	169
Simeiz	Ukraine	1873	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2
Simosato	Japan	7838	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	3
Tahiti	French Polynesia	7124	8	0	0	4	0	4	6	6	3	9	0	0	0	0	1	0	1	0	42
Tateyama	Japan	7339	4	0	0	1	0	5	1	4	2	1	0	0	0	0	1	0	0	0	19
Wettzell	Germany	8834	61	18	3	19	12	49	42	34	42	27	7	25	25	30	23	0	0	0	417
Wuhan	China	7236	2	2	1	0	1	4	3	4	6	1	0	0	0	0	2	0	0	0	26
Yarragadee	Australia	7090	157	0	22	148	0	114	102	121	139	154	0	0	0	0	104	0	12	0	1,073
Zimmerwald	Switzerland	7810	27	0	5	20	0	27	30	34	31	31	0	0	0	0	25	0	0	0	230
Totals:		30	810	63	106	709	69	752	742	775	892	770	27	89	93	94	577	7	48	16	6,639

Site Name	Country	Sta.	Number of Normal Points																		
			GL-62*	GL-64	GL-65*	GL-66*	GL-67	GL-68*	GL-69*	GL-70*	GL-71*	GL-72*	GL-74	GL-75	GL-76	GL-77	GL-79*	GL-80*	GL-81*	GL-82*	Totals
Beijing	China	7249	89	0	0	29	0	46	56	68	67	31	0	0	0	0	0	0	0	0	386
Borowiec	Poland	7811	5	0	0	9	0	3	13	20	18	7	0	0	0	0	9	0	0	0	84
Changchun	China	7237	335	153	35	71	55	258	294	236	275	233	69	131	136	93	154	0	0	4	2,532
Grasse	France	7835	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	10
Grasse (LLR)	France	7845	228	0	23	266	0	161	216	218	466	304	0	0	0	0	258	0	0	0	2,140
Graz	Austria	7839	640	66	64	358	0	446	466	595	562	557	47	217	274	316	364	0	0	0	4,972
Greenbelt	USA	7105	174	0	50	215	0	270	264	243	234	249	0	0	0	0	128	12	66	19	1,924
Haleakala	USA	7210	174	0	30	370	0	331	155	177	360	198	0	0	0	0	2	0	0	0	1,797
Herstmonceux	United Kingdom	7840	249	37	12	148	158	235	241	265	249	239	0	0	0	0	191	0	0	0	2,024
Kashima	Japan	7335	0	0	0	0	0	0	3	10	3	0	0	0	0	0	0	0	0	0	16
Koganei	Japan	7328	14	0	0	0	0	7	6	30	40	4	0	0	0	0	9	0	0	0	110
Komsomolsk-na-Amure	Russia	1868	0	0	0	28	0	0	0	0	118	0	0	0	0	0	0	0	0	0	146
Kunming	China	7820	13	5	0	9	0	4	49	22	35	51	0	0	0	6	5	0	0	0	199
Maidanak	Uzbekistan	1864	3	0	0	21	0	17	15	15	81	1	0	3	0	0	13	0	0	0	169
McDonald	USA	7080	139	0	20	181	3	111	120	110	189	114	0	0	0	0	109	0	12	0	1,108
Metsahovi	Finland	7806	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	7
Miura	Japan	7337	4	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	9
Monument Peak	USA	7110	569	0	46	447	0	611	800	697	681	715	0	0	0	0	398	8	73	60	5,105
Mount Stromlo	Australia	7849	315	0	37	316	0	312	277	291	297	322	0	0	0	0	251	4	24	0	2,446
Orroral	Australia	7843	21	18	19	36	0	18	23	8	25	0	6	42	20	0	22	0	0	0	258
Potsdam	Germany	7836	49	0	5	35	0	67	91	51	66	69	0	0	0	0	36	0	0	0	469
Shanghai	China	7837	196	0	9	93	19	152	220	193	94	282	0	24	19	11	101	0	0	0	1,413
Simeiz	Ukraine	1873	0	0	0	0	0	0	0	0	4	23	0	0	0	0	0	0	0	0	27
Simosato	Japan	7838	0	0	0	7	0	0	7	0	7	0	0	0	0	0	0	0	0	0	21
Tahiti	French Polynesia	7124	37	0	0	19	0	17	31	22	11	39	0	0	0	0	2	0	2	0	180
Tateyama	Japan	7339	19	0	0	4	0	25	4	19	9	8	0	0	0	0	3	0	0	0	91
Wettzell	Germany	8834	249	72	13	81	46	258	177	159	168	153	27	108	98	131	101	0	0	0	1,841
Wuhan	China	7236	21	13	6	0	12	53	30	61	67	8	0	0	0	0	15	0	0	0	286
Yarragadee	Australia	7090	775	0	70	586	0	456	442	506	678	773	0	0	0	0	399	0	60	0	4,745
Zimmerwald	Switzerland	7810	300	0	28	127	0	220	262	225	196	282	0	0	0	0	175	0	0	0	1,815
Totals:		30	4,618	364	467	3,456	293	4,100	4,262	4,241	5,000	4,662	149	525	547	557	2,745	24	237	83	36,330

Notes: *****indicates GLONASS satellites specifically requested for SLR tracking
GLONASS-65 failed in December 1998
GLONASS-80, -81, -82 launched December 30, 1998

Table A-6. GLONASS Satellite Numbering Systems

Slot	Plane	SLR Number	GLONASS Number	Frequency Channel	COSMOS Number	COSPAR Number	Status (10-Sep-99)
1	1	82	779	2	2364	9807703	Useable
3	1	68	763	21	2295	9407601	--
4	1	70	762	12	2294	9407603	--
6	1	69	764	13	2296	9407602	Useable
7	1	80	786	7	2362	9807701	Useable
8	1	81	784	8	2363	9807702	Useable
9	2	77	776	6	2323	9506801	Useable
10	2	75	781	9	2317	9503702	Useable
11	2	76	785	4	2318	9503703	Useable
12	2	65	767	22	2287	9405001	--
13	2	79	782	6	2325	9506803	Useable
14	2	67	770	9	2288	9405003	--
15	2	78	778	11	2324	9506802	Useable
16	2	66	775	22	2289	9405002	Useable
17	3	62	760	24	2276	9402101	--
18	3	64	758	10	2275	9402103	--
20	3	71	765	1	2307	9500901	--
22	3	72	766	10	2308	9500902	Useable

Note: **L1** = 1602. + 0.5625 * K Mhz
L2 = 1246. + 0.4375 * K Mhz
where K = frequency channel number

Table A-7. Web Sites Related to GLONASS

International GLONASS Experiment (IGEX-98):

Institut Geographique National (IGN):
http://lareg.ensg.ign.fr/IGEX/

Institute of Navigation (ION):
http://164.214.2.59/GandG/ion/index.htm

International Services and Organizations:

International Association of Geodesy (IAG)
http://www.gfy.ku.dk/~iag/

International Earth Rotation Service (IERS)
http://hpiers.obspm.fr

International GPS Service (IGS)
http://igscb.jpl.nasa.gov

International Laser Ranging Service (ILRS)
http://ilrs.gsfc.nasa.gov/glonass.html

International Union of Geodesy and Geophysics (IUGG)
http://www.omp.obs-mip.fr/uggi/

International Agencies:

Bundesamt für Kartographie und Geodäsie (BKG) GLONASS Information
http://gibs.leipzig.ifag.de/cgi-bin/info_glo.cgi?en

Bureau International de Poids et Mesures (BIPM)
http://www.bipm.fr

Deutsches Zentrum für Luft- und Raumfahrt (DLR) Neustrelitz Remote Sensing Ground Station GLONASS Updated Information Service
http://www.nz.dlr.de/gps/glonass.html

Onsala Space Observatory GLONASS Information
http://www.oso.chalmers.se/~geo/glonass.html

Russian Federation Ministry of Defense Coordination Scientific Information Center
http://www.rssi.ru/SFCSIC/SFCSIC_main.html

Russian Space Agency Mission Control Center (MCC) Analytical Information Center for Coordinate and Time Service
http://www.mcc.rsa.ru/IACKVO/homepage1.html

U.S. Agencies, Universities, and Organizations:

Crustal Dynamics Data Information System (CDDIS)
http://cddisa.gsfc.nasa.gov

Institute of Navigation (ION)
http://www.ion.org

ION GPS/GLONASS Interoperability Working Group
http://www.ion.org/workgroup.html

University of Maine GPS GLONASS Geodesy
http://www.spatial.maine.edu/~leick

3-S Navigation
http://www.3snavigation.com/indexNav.htm

Javad Positioning Systems
http://www.javad.com

Magellan Corporation/Ashtech Precision Products
http://www.ashtech.com

Miscellaneous Links:

International Terrestrial Reference Frame (ITRF)
http://lareg.ensg.ign.fr/ITRF/

Parameters of Earth 1990 (PZ-90)
http://rssi.ru/SFCSIC/pz90_e.html

IGS

ACRONYMS AND ABBREVIATIONS

Acronyms and Abbreviations

3S	3S Navigation, U.S.
AAS	American Astronomical Society
AC	(IGS or IGEX) Analysis Center
ACRI	Analytical and Computational Research, Inc., France
AGRS.NL	Active GPS Reference System for The Netherlands
AGU	American Geophysical Union
AIAA	American Institute for Aeronautics and Astronautics
AIUB	Astronomical Institute of Berne, Switzerland
A/C	Across track
A/L	Along track
ALSM	Airborne laser swath mapping
ANSI	American National Standards Institute
AOB	Astrogeodynamical Observatory of Borowiec, Poland
AOL	Americal On-Line
AOS	Ashtech Office Suite
ARP	Antenna reference point
AS	Anti-spoofing
ASI	Italian Space Agency
ASIC	Application specific integrated circuit
ASME	American Society of Mechanical Engineers
ATSC	AlliedSignal Technical Services Corporation, U.S.
AUSLIG	Australian Surveying and Land Information Group
BIFROST	Baseline Inferences for Fennoscandian Rebound, Sea-level, and Tectonics
BIH	Bureau International de l'Heure (now IERS)
BIPM	Bureau International des Poids et Mesures, France
BKG	Bundesamt für Kartographie und Geodäsie, Germany
C/A	Coarse/acquisition or clear/access code
CAA	Civil Aviation Authority, United Kingdom
CDDIS	Crustal Dynamics Data Information System, U.S.
CERGA	Centre d'Etudes et de Recherches Geodynamiques et Astronomiques, France
CIGNET	Cooperative International GPS Network
CIPM	Comité International des Poids et Mesures
CIT	California Institute of Technology, U.S.
CNES	Centre National d'Etudes Spatiales, France
CODE	Center for Orbit Determination in Europe
CoM	Center of mass
CORS	Continuously Operating Reference Station
COSPAR	Committee on Space Research
CRL	Communications Research Laboratory, Japan
CSIR	Council for Scientific and Industrial Research, South Africa
CSIRO	Commonwealth Scientific and Industrial Research Organization, Australia
CSR	Center for Space Research, University of Texas at Austin, U.S.
CSTG	International Coordination of Space Techniques for Geodesy and Geodynamics
DB	Data base
DCE	Les Centres d'Expertise et d'Essais de la DGA, France
DFD	Deutsches Fernerkundungsdatenzentrum (German Remote Sensing Data Center)
DGA	Delegation Generale pour l'Armement, France
DGFI	Deutsches Geodätisches Forschungsinstitut, Germany
DIA	Detection, Identification, and Adaption
DLR	Deutsche Forschungsanstalt für Luft- und Raumfahrt. Germany
DNR	Department of Natural Resources, Australia
DMA	Defense Mapping Agency (now NIMA), U.S.
DoD	(U.S.) Department of Defense
DOLA	Department of Land Administration, Australia

DOMES	Directory of MERIT Sites
DORIS	Determination of Orbit Radiopositioning Integrated by Satellite
DOY	Day of year
DUT	Delft University of Technology, the Netherlands
ECEF	Earth-centered Earth-fixed
EDC	EUROLAS Data Center, Germany
EGM	Earth Gravity Model
EGS	European Geophysical Society
ENSG	Ecole Nationale des Sciences Géographiques, France
ENRI	Electronic Navigation Research Institute, Japan
EOP	Earth orientation parameters
EPS	Earth-probe-Sun
EPSHOM	Service Hydrographique et Océanographique de la Marine, France
ERP	Earth rotation parameter
ESA	European Space Agency
ESOC	ESA Space Operations Center
ESTEC	European Space Research and Technology Center
EUREF	European Reference Frame
EUROLAS	European Laser Consortium
FAA	Federal Aviation Administration, U.S.
FAGS	Federation of Astronomical and Geophysical Data Analysis Services
FLINN	Fiducial Laboratories for an International Natural Science Network, U.S.
FTP	File transfer protocol
GAS	GPS Analysis Software, U.K.
GDA	Geocentric Datum of Australia
GDC	(IGEX) Global Data Center
GDOP	Geometric dilution of precision
GFZ	GeoForschungsZentrum, Germany
GGAO	Goddard Geophysical and Astronomical Observatory, U.S.
G-GIWG	GPS-GLONASS Interoperability Working Group
GHz	Gigahertz
GIS	Geographic Information System
GLOBK	Global Kalman filter
GLONASS	Global'naya Navigatsionnay Sputnikovaya Sistema (Global Navigation Satellite System)
GM	Gravity model
GmbH	Gesellschaft Mit Beschraenkter Haftung
GMT	Greenwich Mean Time
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
GRD	Geosciences Research Division, U.S.
GSC	Geological Survey of Canada
GSFC	Goddard Space Flight Center, U.S.
GSI	Geographical Survey Institute, Japan
HARN	High Accuracy Reference Network
HDOP	Horizontal dilution of precision
HKPU	Hong Kong Polytechnic University, China
HQ	(NASA) Headquarters
HRAO	Hartebeesthoek Radio Astronomy Observatory, South Africa
IAA	Institute of Applied Astronomy, Russia
IAC CTS	Information and Analysis Center of Coordinate and Time Supply, Russia
IAG	International Association of Geodesy
IARAS	Institute of Astronomy, Russian Academy of Sciences
IAU	International Astronomical Union
ICAO	International Civil Aviation Organization
ICD	Interface control document
IEEE	Institute of Electrical and Electronic Engineers
IEN	Istituto Elettrotecnico Nazionale, Italy

IERS	International Earth Rotation Service
IfEN	Institute fuer Erdmessung und Navigation, University FAF Munich, Germany
IGEX	International GLONASS Experiment
IGN	Institut Géographique National, France
IGPP	Institute of Geophysics and Planetary Physics, U.S.
IGS	International GPS Service
ILRS	International Laser Ranging Service
IMEC	Interuniversitair Micro-Elektronica Centrum, Belgium
IMO	International Maritime Organization
IMVP	Institute of Metrology for Time and Space, Russia
INASAN	Institute of Astronomy of the Russian Academy of Sciences
INMARSAT	International Mobile Satellite Organization
ION	Institute of Navigation, U.S.
ISN	Institute of Satellite Navigation, U.K.
ISR	Institute for Space Research, Austria
ITRF	IERS Terrestrial Reference Frame (often referred to as International Terrestrial Reference Frame)
ITRS	International Terrestrial Reference System
IUGG	International Union of Geodesy and Geophysics
IVS	International VLBI Service for Geodesy and Astrometry
IVTAN	Institute for High Temperature of the Russian Academy of Sciences
JGM	Joint Gravity Model
JPL	Jet Propulsion Laboratory, U.S.
JPS	Javad Positioning Systems
KMS	National Survey and Cadastre, Denmark
KNITs	Coordination Scientific Information Center, Russia
LAN	Local area network
LAREG	Laboratoire de Recherche en Géodésie, France
LDC	(IGEX) Local Data Center
LL	Lincoln Laboratories, U.S.
LLR	Lunar laser ranging
LOD	Length of day
LRA	Laser retroreflector array
LRBA	Laboratoire de Recherches Balistiques et Aerodynamiques, France
LSM	Least squares method
MCC	Mission Control Center, Russia
MDB	Minimal detectable bias
MERIT	Monitoring of Earth Rotation and Intercomparison of Techniques
MHz	Megahertz
MIT	Massachusetts Institute of Technology, U.S.
MOBLAS	Mobile laser system, U.S.
MOD	Ministry of Defense, France
MSS	Mobile Satellite Service
NAGU	Notice Advisories of GLONASS Users
NANU	Notice Advisory to NAVSTAR Users
NASA	National Aeronautics and Space Administration, U.S.
NAVSTAR	Navigation Satellite Timing and Ranging
NCC	Network Control Center, Sweden
NCKU	National Cheng Kung University, Taiwan
NERC	Natural Environment Research Council U.K.
NGI	Next generation Internet
NGS	National Geodetic Survey, U.S.
NIMA	National Imagery and Mapping Agency, U.S.
NIST	National Institute of Science and Technology, U.S.
NKG	Nordic Commission of Geodesy, Norway
NLS	National Land Survey, Sweden
NMA	Norwegian Mapping Authority
NML	National Measurement Laboratory, Australia

NOAA	National Oceanic and Atmospheric Administration, U.S.
NORAD	North American Aerospace Defense Command
NPL	National Physical Laboratory, United Kingdom
NPL	National Physical Laboratory, India
NPO PM	Nauchno-proizvodstvennoe ob'edinenie prikladnoy mekhaniki imeni akademika M.F.Reshetnyova (M.F.Reshetnyov Science and Production Association of Applied Mechanics), Russia
NRCan	Natural Resources, Canada
NRL	Naval Research Laboratory, U.S.
NRT	Near real time
ns	Nanosecond
OCA	Observatoire de la Cote d'Azure, France
OD	Orbit determination
ODC	(IGEX) Operational Data Center
OP	Observatoire de Paris, France
ORB	Observatoire Royale de Belgique
OSO	Onsala Space Observatory
PC	Personal computer
PDOP	Position dilution of precision
PGC	Pacific Geoscience Center, Canada
PM	Polar motion
PMT	Photo multiplier tube
POD	Precision orbit determination
PPS	Precise Positioning Service
PRARE	Precise Range and Range Rate Equipment
PTTI	Precise Time and Time Interval
PZ-90	Parameters of the Earth 1990
QC	Quality check
Rad	Radial
RAIM	Receiver Autonomous Integrity Monitoring
RAS	Russian Academy of Science
RDBMS	Relational data base management system
RDC	(IGEX) Regional Data Center
RGO	Royal Greenwich Observatory, U.K.
RINEX	Receiver Independent Exchange
RITSS	Raytheon Information Technology and Scientific Services, U.S.
RMS	Root mean square
ROB	Royal Observatory of Belgium
RSA	Russian Space Agency
RTCA	Radio Technical Commission for Aeronautics
RTCM	Radio Technical Commission for Maritime Services
RTK	Real-time kinematic
SA	Selective availability
SAO	Smithsonian Astrophysical Observatory
SARP	Standard of Recommended Practice
SCC	GLONASS System Control Center, Russia
SFCSIC	Coordinational Scientific Information Center of Russian Space Forces
SINEX	Software Independent Exchange
SIO	Scripps Institution of Oceanography. U.S.
SLR	Satellite laser ranging
SNS	Space navigation system
SPAD	Single photon avalanche diode
SPOT	Satellite Probatoire d'Observation de la Terre, France
SPS	Standard Positioning Service
SRC	Sequoia Research Corporation, U.S.
SRP	Solar radiation pressure
SV	Space vehicle
SW	Software

SWAG	South-West Australia GPS Software
SWEPOS	Swedish Permanent GPS Network
TAI	International Atomic Time
TCP/IP	Transmission Control Protocol/Internet Protocol
TDRS	Tracking and Data Relay Satellite
TEC	Total electron content
TEQC	Translate/edit/quality check
TOE	Time of ephemeris
TOPEX	Ocean TOPography EXperiment
TRF	Terrestrial Reference Frame
TSA	3S Navigation temperature stabilized antenna system
TsNIIGAIK	Central Research Institute of Geodesy, Aerial Surveying, and Cartography, Russia
TSRMD	Topographic Service of the Ministry of Defense, Russia
TU	Technical University, Vienna, Austria
UF	University of Florida, U.S.
UK	United Kingdom
UNAVCO	University NAVSTAR Consortium, U.S.
UNESP	Universidade Esadual Paulista, Brazil
UPS	Uninterruptable power supply
URE	User range error
URL	Uniform resource locator
USA	United States of America
USAF	United States Air Force
USGS	United States Geological Survey
USNO	United States Naval Observatory
UT	Universal time
UTC	Universal time coordinated
VSL	NMi Van Swinden Laboratorium, The Netherlands
VDOP	Vertical dilution of precision
VLBI	Very long baseline interferometry
WGS	World Geodetic System
wrt	With respect to
WWW	World wide web
Y2K	Year 2000