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4613 Mamoru (1990 OM)

Classification: Main-belt Asteroid **SPK-ID:** 2004613

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Orbital Elements at Epoch 2456600.5 (2013-Nov-04.0) TDB Reference: [JPL 5](#) (heliocentric ecliptic J2000)

Element	Value	Uncertainty (1-sigma)	Units
e	.3044241182480605	6.9151e-08	
a	2.661512690012657	1.1000e-00	AU
q	1.851284038444931	1.8285e-07	AU
i	6.655820723359962	6.6413e-06	deg
node	145.0108790220775	6.4776e-05	deg
peri	255.3069012808952	6.5698e-05	deg
M	85.86919976308924	1.1114e-05	deg
t_p	2456222.20887341312/ (2012 Oct 21.70887341)	4.8194e-05	JED
period	1585.956384209988	9.9108e-06	d
	4.34	2.713e-08	yr
n	.2269920710207446	1.4105e-09	deg/d
Q	3.471741348180383	1.4463e-08	AU

Orbit Determination Parameters

# obs. used (total)	1176
data-arc span	30773 days (84.25 yr)
first obs. used	1929-09-06
last obs. used	2013-12-07
planetary ephem.	DE431
SB-pert. ephem.	SB431-BIG16
condition code	0
fit RMS	.56366
data source	ORB
producer	Otto Matic
solution date	2013-Dec-19 22:05:32

Additional Information

Earth MOID	= .871862 AU
T_{jup}	= 3.308

[[show covariance matrix](#)]

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Physical Parameter Table

Parameter	Symbol	Value	Units	Sigma	Reference	Notes
absolute magnitude	H	11.6	mag	n/a	MPO259371	
rotation period	rot_per	5.388	h	n/a	Asteroid Lightcurve DataBase (Rev. 2013-Sep-12)	Published Reference List: [Casalnuovo, G.B. (2013) Minor Planet Bul. 40, 122.]