

Data ingest was developed for orbit and observation data from the MPC. Ingested data was used to attribute tracklets from real data (Spacewatch 2007-Jun). The following contains brief instructions for processing this data. Command lines are examples only.

Multiple detections are inserted into a single tracklet. The tracklet is associated with a single field. The field status should be set such that it will not be processed. A Derived Object is associated to this tracklet and an orbit for the detections.

The initial processing was for the MPC numbered objects. The data consisted of two files.

1. mpn.arc - 32 MB - Orbits for numbered objects.
2. mpn.arc - 2935 MB - Observations for numbered objects.

Configure Perl environment

Modules that contain modified code should be placed ahead of the normal Perl modules so they have precedence.

```
$ export PERL5LIB={your data processing path}/lib/perl5:$PERL5LIB
```

Modified library files

PS::MOPS::DC::DerivedObject

PS::MOPS::DC::Detection

PS::MOPS::JPLORB - Print full output, for logging purposes.

PS::MOPS::MITI - Extra processing added to mpc_to_miti().

New library files

PS::MOPS::MPCLib

Split the large detections file into smaller files.

Due to file system limitations, the observations file is split into many smaller files.

```
$ cat mpn.arc | ./keep-together-split.pl
```

Creates **data.out.nnn.mpc** files.

36981149 records/lines in mpn.arc.

Verified that data.out contains same number.

Note that the MPC observatory codes (in /usr/local/caet_data) used with the JPL software should be current with the data being processed.

Convert MPC observation files to MITI format.

```
$ time perl convert-to-miti-batch.pl 2>&1 | tee miti-batch.log
```

Generates two log files per miti file. One contains records missing magnitude (mag), the other contains records missing/bad items other than mag or mag + other items. A reason code for each failure is listed in the log.

One run took 92 min for 29779380 detections in miti format.

Convert MPC orbits to "IOD" format.

```
$ ./convert-mpc-orbits.pl ../mpc-numbered-orbits.mpc MPN > orbits.iod/mpc-numbered-objects-orbits.iod
```

Generate orbits using the JPL software for specific files

```
$ ./generate-orbits.pl miti.mops/mpc-observations.370.miti orbits.iod/mpc-numbered-objects-orbits.iod 370 2>&1 | tee mpc-orbits.log
```

Generate orbits - batch processing

```
$ ./generate-orbits-batch.pl
```

One run resulted in 159029 (reported in mpc-orbits.success) recalculated orbits out of 159366 orbits.

Insert a field

```
$ ./insert-mpc-fields.pl
```

Note that the tracklets inserted should reference the dummy field. The field status should be updated so that it does not get processed.

Insert MOPS objects using specific files

```
$ ./insert-mops-objects.pl detections.370.stor diffcor-orbits.370.stor
```

Insert MOPS objects - batch processing

```
$ ./insert-mops-objects-batch.pl
```

Run simulation

Find tracklets and attribute them.

Example times for MPC numbered objects on 2007-Jun Spacewatch data

Time (hr)	Process
28.23	Generate orbits
30.82	Insert MOPS objects
15.05	dtctl (attribution)

See attribution-mpc-numbered-and-2007-jun-sw.txt for results.