COVIS Data Management

The data will buffered locally in a CouchDB document database. The database will store the last *TBD* days of data. Periodically, the data will be packaged for transport by DMAS (see Data Export).

Storage Format

The database will contain the following record types:

Sweep record

Denotes the start of a ping sweep. May also contain user annotations about the sweep:

```
{
  "schema": "sweep",
  "mode": "imaging" OR "doppler" OR "diffuse",
  "timestamp": [SECS, USECS],
  "_id": SWEEP_UUID,
  "annotation": {...}
}
```

Position record

Contains the sonar orientation as determined by the attitude sensor:

```
{
  "schema": "position",
  "timestamp": [SECS, USECS],
  "_id": POSITION_UUID,
  "sweep_id": SWEEP_UUID,
  "data": {"kHeading": ANGLE,
           "kPAngle": ANGLE,
           "kRAngle": ANGLE}
}
```

Rotator record

Contains the motor rotation angles:

```
{
   "schema": "rotator",
   "timestamp": [SECS, USECS],
   "_id": ROTATOR_UUID,
   "sweep_id": SWEEP_UUID,
   "data": {"yaw": ANGLE,
            "pitch": ANGLE,
            "roll": ANGLE}
}
```

Reson record

Contains a data-record from the Reson sonar system. This record has links to the current sweep and orientation records. If the contents property is present, it contains the data-record in JSON format, otherwise, the data-record is stored as an attachment in raw,

binary form. The raw form of the record contains the *Record Header* and *Record Data* sections described in the Reson documentation (but not the *Data Record Frame*):

```
{
  "schema": "s7k",
  "timestamp": [SECS, USECS],
  "_id": S7K_UUID,
  "sweep_id": SWEEP_UUID,
  "position_id": POSITION_UUID,
  "rotator_id": ROTATOR_UUID,
  "type": 7KCENTER_TYPE_CODE,
  "contents": {…}
}
```

Data Export

All of the data associated with a single sweep will be exported to a ZIP archive. This archive is the file that DMAS will retrieve via FTP.

The archive files will be named COVIS_MODE_YYYYMMDDHHMMSS.zip where the timestamp is the time the sweep started and MODE is the sampling mode, one of:

- IMAGING
- DOPPLER
- DIFFUSE

Each archive will contain the following files:

sweep.json

JSON format file containing the Sweep record from the database. The field of interest will be "mode". There is a JSON parser available for Matlab at http://www.mathworks.com/matlabcentral/fileexchange/20565-json-parser .

rec_7000_NNNNNN.json

one file per ping containing sonar metadata. NNNNNN is the zero-padded ping number.

rec_7038_NNNNNN.bin

one file per ping containing sonar raw IQ data (data-record type 7038). NNNNNN is the zero-padded ping number.

index.csv

CSV file mapping the ping number to a timestamp and orientation information. This file will have the following columns.

ping

ping index number.

seconds

first component of the timestamp, time in seconds since 1/1/1970 UTC

microseconds

fractional part of the timestamp

pitch

rotator pitch setting in degrees

roll

rotator roll setting in degrees

yaw

rotator yaw setting in degrees

kPAngle

pitch angle reading from attitude sensor

kRAngle

roll angle reading from attitude sensor

kHeading

compass heading from attitude sensor

rotator.csv

CSV file containing the rotator sensor readings for each position (useful during testing if no sonar data is taken)

attitude.csv

CSV file containing the attitude sensor readings for each position (useful during testing if no sonar data is taken)