EXPLORER 6

EPHEMERIS, POSN, VEL, B MODEL

59-004A-00D

THIS DATA SET HAS BEEN RESTORED. ORIGINALLY IT CONTAINED ONE 7-TRACK, 556 BPI TAPE WRITTEN IN BINARY. THERE IS ONE RESTORED TAPE, WHICH WAS PADDED DURING THE RESTORATION PROCESS. THE DR TAPE IS A 3480 CARTRIDGE AND THE DS TAPE IS 9-TRACK, 6250 BPI. THE ORIGINAL TAPE WAS CREATED ON AN IBM 7094 COMPUTER. THE DR AND DS NUMBER ALONG WITH THE CORRESPONDING D NUMBER AND THE SPAN IS AS FOLLOW:

DR#	DS#	D#	FILES	TIME SPAN
DR002837	DS002837	D001003	1	08/07/59 - 08/09/59

556 BPI Exp. 6 Eph. 69-004A-00D

Table 4. Orbital Tape Format-3A (TCB) D-01003

WORD NUMBER	WORD CONTENTS C-00632
	Binary Title Record Format
0	Fortran data record size indicator = 000375010001_8 (Underlined octal number indicates a total data word count of 253 words.)
1	Form of data identification = 76799361
2-3	Satellite identification
4	Date — U.T. Start Time of Satellite Data
5	Day Count of Year — U.T. Start Time of Satellite Data
6	Seconds of Day — U.T. Start Time of Satellite Data
7	Date — U.T. End Time of Satellite Data
8	Day Count of Year — U.T. End Time of Satellite Data
9	Seconds of Day — U.T. End Time of Satellite Data
10	= Δt in seconds, if tape has equal intervals = 0, if tape has unequal intervals
11	No. of data items in data record = 12 (includes a special type of item as item no. 12)
12	No. of words per data item = 21
13	No. of words per data item that are a function of time (these words follow the time words consecutively) = 16
14	No. of words in data record = 256
15	Spare
16-26	Run identification data
27	Date — Coordinate System Reference Data Time and Position
28	Day Count of Year — Coordinate System Reference Data Time and Position
29	Apparent Sidereal Time in radians — Coordinate System Reference Data Time and Position
30-40	Used for harmonics, etc.
41	Date — Epoch
42	Day Count of Year — Epoch
43	Seconds of Day — Epoch
44	Semi-major axis, a (km.)
45	Eccentricity, e (ratio)
46	Inclination, I (deg.)
47	Right ascension of ascending node, Ω (deg.)
48	Rate of change of R.A. of ascending node, $\dot{\Omega}$ (deg./day)
49	Argument of perigee, ω (deg.)
50	Rate of change of argument of perigee, $\dot{\omega}$ (deg./day)
51	Period, P (min.)
52	Rate of change of period, $\dot{P}$ (min./day)
53-253	Used for elements, drags, etc.
254	Check sum of words in word no. 1-253
255	Same as word 0

Table 4. Orbital Tape Format-3A (TCB)

WORD NUMBER	WORD CONTENTS
	Binary Sentinel Record Format
0	Fortran data record size indicator = 000375010001_8 (Underlined octal number indicates a total data word count of 253 words.)
1	99999999
2-253	Irrelevant
254	Check sum of data words in word no. 1-253
255	Same as word 0

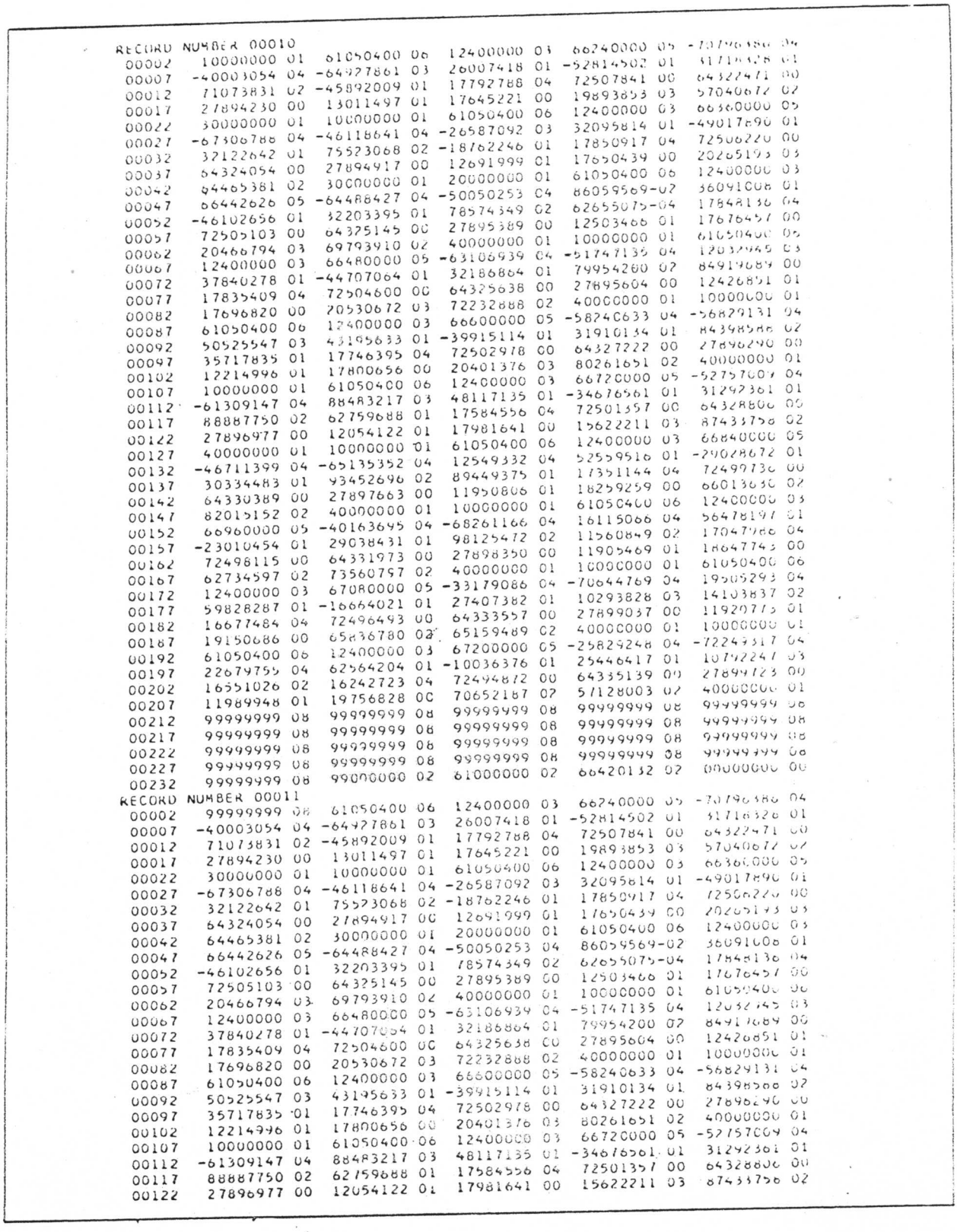
Note:

1. All words are in floating point form except for words 0, 254, and 255, which are in fixed point form.
2. Longitude is positive east of Greenwich; negative west.
3. Northern latitudes are positive; southern latitudes are negative.
4. Date of data = day + 100 (months + year (100)). (Example: Feb. 10, 1962 at 2 hours is recorded as 620210 in date of data, 41 in day count of year and 7200 in seconds of day).
5. The satellite and the solar position vectors are referenced to an equatorial coordinate system with the origin at the center of the earth, the x-axis in the direction of the vernal equinox, the z-axis along the North Pole of the earth, and the y-axis forming a right-handed coordinate system.
6. Reference day data of apparent sidereal time is obtained from "The American Ephemeris and Nautical Almanac" for the given year.
7. The last valid data item in a data record is followed by an item of 9's. If the last valid data item fills a record, a data binary record follows which contains 9's in words 1-21. 9's are equal to 99999999 in floating point.

```
                    FLOATING POINT BINARY TAPE DUMP

                        DUMP OF BINARY OR3A TAPE
                            FROM R104 RUN
254  002  00000  00000  000
RECORD NUMBER 00001
 00002   76179361 08   61131000 05   00000000 00   61050400 06   12400000 03
 00007   59400000 05   61050400 06   12400000 03   67200000 05   00000000 00
 00012   12000000 02   21000000 02   16000000 02   25600000 03   76796700 06
 00017   00000000 00   00000000 00   79910000 04   90940079 08   64750083 06
 00022   76006765 08   83007418 08   76188318 08   61756400 06   76796700 06
 00027   30936100 08   61042700 06   11700000 03   37479040 01   00000000 00
 00032   00000000 00   00000000 00   54109499-03   22849999-05   79612497-06
 00037   23199999-06   16232849-02   00000000 00   00000000 00   00000000 00
 00042   61050400 06   12400000 03   51960000 05   75186287 04   86561018-01
 00047   28799325 02   21866254 03  -49824465 01   17667803 03   80726004 01
 00052   10813176 03  -36653803-03   00000000 00   00000000 00   00000000 00
 00102   81399844 03   11787662 01   86561018-01   18808503 01  -87110456 00
 00107   60902777 00  -56060203 00  -61297063 00  -65954610 00   72596720-01
 00112   12016707 01   90332950 00   49644636 01   17128512 01   49644636 01
 00117   30836133 01   50264304 00   38163812 01  -84468275-01   78137406 00
 00122   17972031 01   13157100-02  -81206238-03   80412104 01   76731070-01
 00127   26080148 00   00000000 00   00000000 00   00000000 00   00000000 00
 00132   81399844 03   00000000 00   00000000 00   00000000 00   00000000 00
 00152   12366977-07   00000000 00   00000000 00   00000000 00   00000000 00
 00192   61000000 02   50000000 01   40000000 01   14000000 02   26000000 02
 00197   00000000 00   00000000 00   10000000 01   00000000 00   30000000 01
RECORD NUMBER 00002
 00002   10000000 01   61050400 06   12400000 03   59400000 05  -76611063 04
 00007  -19303115 04  -17706781 04   60405509 00  -60863943 01   28358120 01
 00012   84325546 02  -12697596 02   17191829 04   72600170 00   64232137 00
 00017   27855059 00   14329196 01   20568999 00   18781837 03   33800150 02
 00022   20000000 01   10000000 01   61050400 06   12400000 03   59520000 05
 00027  -75474776 04  -26489650 04  -14214346 04   12869238 01  -58808401 01
 00032   29794519 01   89071888 02  -10128993 02   17464283 04   72598551 00
 00037   64233722 00   27855747 00   13809203 01   20202168 00   19397083 03
 00042   40226065 02   20000000 01   10000000 01   61050400 06   12400000 03
 00047   59640000 05  -73530226 04  -33393055 04  -10569155 04   19501205 01
 00052  -56143544 01   30899983 01   93605488 02  -74957815 01   17666041 04
 00057   72596932 00   64235308 00   27856435 00   13343057 01   19778190 00
 00062   20009194 03   47288395 02   20000000 01   10000000 01   61050400 06
 00067   12400000 03   59760000 05  -70804305 04  -39941296 04  -68115509 03
 00072   25885559 01  -52900022 01   31670440 01   98107109 02  -48148577 01
 00077   17795530 04   72595313 00   64236894 00   27857122 00   12938301 01
 00082   19333895 00   20671609 03   54955422 02   20000000 01   10000000 01
 00087   61050400 06   12400000 03   59880000 05  -67329482 04  -46067166 04
 00092  -29817219 03   31974600 01  -49108834 01   32103050 01   10255818 03
 00097  -21042447 01   17851792 04   72593694 00   64238479 00   27857810 00
 00102   12601309 01   18911023 00   21242955 03   63161287 02   20000000 01
 00107   20000000 01   61050400 06   12400000 03   59972676 05  -64157088 04
 00112  -50468959 04   16784667-03   36445891 01  -45826053 01   32204646 01
 00117   10598106 03   25748666-05   17844847 04   72592444 00   64239704 00
 00122   27858341 00   12390230 01   18624480 00   21743157 03   69614758 02
 00127   30000000 01   10000000 01   61050400 06   12400000 03   60000000 05
 00132  -63143814 04  -51707103 04   87983575 02   37721985 01  -44801615 01
 00137   32195809 01   10698995 03   62092067 00   17834406 04   72597076 00
 00142   64240065 00   27858498 00   12337149 01   18551022 00   21698072 03
 00147   71796520 02   30000000 01   10000000 01   61050400 06   12400000 03
 00152   60120000 05  -58291467 04  -56800645 04   47318782 03   43081587 01
 00157  -40012548 01   31947543 01   11143320 03   33449448 01   17743529 04
 00162   72590456 00   64241651 00   27859185 00   12145887 01   18269404 00
 00167   22704647 03   80698551 02   30000000 01   10000000 01   61050400 06
 00172   12400000 03   60240000 05  -52821499 04  -61292222 04   85436339 03
 00177   48006621 01  -34775559 01   31357946 01   11591925 03   60522826 01
 00182   17579853 04   72588838 00   64243236 00   27859873 00   12026722 01
 00187   18150473 00   29929111 03   89173615 02   30000000 01   10000000 01
 00192   61050400 06   12400000 03   60360000 05  -46788164 04  -65130493 04
 00197   12244360 04   52458450 01  -29127191 01   30427560 01   12048092 03
 00202   87265775 01   17344630 04   72587220 00   64244823 00   27860260 00
 00207   11976183 01   18144226 00   48291909 02   81343566 02   30000000 01
 00212   10000000 01   61050400 06   12400000 03   60480000 05  -40252066 04
 00217  -68268043 04   15822878 04   56385644 01  -23107248 01   29150192 01
 00222   12514683 03   11349649 02   17039732 04   72585600 00   64246406 00
 00227   27861247 00   11985867 01   18266166 00   56443081 02   72796785 02
 00232   30000000 01   99000000 02   61000000 02   00000000 00   00000000 00
```

Figure 9. Listing of Sample Orbital Tape Format-3A (TCB)



```
RECORD NUMBER 00010
 00002   10000000 01   61050400 06   12400000 03   66240000 05   -73796486 04
 00007  -40003054 04  -64927861 03   26007418 01  -52814502 01    31716528 01
 00012   71073831 02  -45892009 01   17792788 04   72507841 00    64322471 00
 00017   27894230 00   13011497 01   17645221 00   19893853 03    57040672 02
 00022   30000000 01   10000000 01   61050400 06   12400000 03    66360000 05
 00027  -67306788 04  -46118641 04  -26587092 03   32095814 01   -49017890 01
 00032   32122642 01   75523068 02  -18762246 01   17850917 04    72506220 00
 00037   64324054 00   27894917 00   12691999 01   17650439 00    20265193 03
 00042   64465381 02   30000000 01   20000000 01   61050400 06    12400000 03
 00047   66442626 05  -64488427 04  -50050253 04   86059569-02    36091008 01
 00052  -46102656 01   32203395 01   78574349 02   62655075-04    17848136 04
 00057   72505103 00   64325145 00   27895389 00   12503466 01    17676457 00
 00062   20466794 03   69793910 02   40000000 01   10000000 01    61050400 06
 00067   12400000 03   66480000 05  -63106939 04  -51747135 04    12032445 03
 00072   37840278 01  -44707064 01   32186864 01   79954200 02    84919689 00
 00077   17835409 04   72504600 00   64325638 00   27895604 00    12426851 01
 00082   17696820 00   20530672 03   72232888 02   40000000 01    10000000 01
 00087   61050400 06   12400000 03   66600000 05  -58240633 04   -56829131 04
 00092   50525547 03   43195633 01  -39915114 01   31910134 01    84398588 02
 00097   35717835 01   17746395 04   72502978 00   64327222 00    27896290 00
 00102   12214996 01   17800656 00   20401376 03   80261651 02    40000000 01
 00107   10000000 01   61050400 06   12400000 03   66720000 05   -52757609 04
 00112  -61309147 04   88483217 03   48117135 01  -34676561 01    31292361 01
 00117   88887750 02   62759688 01   17584556 04   72501357 00    64328800 00
 00122   27896977 00   12054122 01   17981641 00   15622211 03    87433756 02
 00127   40000000 01   10000000 01   61050400 06   12400000 03    66840000 05
 00132  -46711399 04  -65135352 04   12549332 04   52559516 01   -29028672 01
 00137   30334483 01   93452696 02   89449375 01   17351144 04    72497136 00
 00142   64330389 00   27897663 00   11950806 01   18259259 00    66013636 02
 00147   82015152 02   40000000 01   10000000 01   61050400 06    12400000 03
 00152   66960000 05  -40163695 04  -68261166 04   16115066 04    56478197 01
 00157  -23010454 01   29038431 01   98125472 02   11560849 02    17047986 04
 00162   72498115 00   64331973 00   27898350 00   11905469 01    18647745 00
 00167   62734597 02   73560797 02   40000000 01   10000000 01    61050400 06
 00172   12400000 03   67080000 05  -33179086 04  -70644769 04    19505293 04
 00177   59828287 01  -16664021 01   27407382 01   10293828 03    14103837 02
 00182   16677484 04   72496493 00   64333557 00   27899037 00    11920775 01
 00187   19150686 00   65836780 02   65159489 02   40000000 01    10000000 01
 00192   61050400 06   12400000 03   67200000 05  -25829248 04   -72243317 04
 00197   22679755 04   62564204 01  -10036376 01   25446417 01    10792247 03
 00202   16551026 02   16242723 04   72494872 00   64335139 00    27894723 00
 00207   11989948 01   19756828 00   70652187 02   57128003 02    40000000 01
 00212   99999999 08   99999999 08   99999999 08   99999999 08    99999999 08
 00217   99999999 08   99999999 08   99999999 08   99999999 08    99999999 08
 00222   99999999 08   99999999 08   99999999 08   99999999 08    99999999 08
 00227   99999999 08   99999999 08   99999999 08   99999999 08    99999999 08
 00232   99999999 08   99000000 02   61000000 02   66420132 02    00000000 00
RECORD NUMBER 00011
 00002   99999999 08   61050400 06   12400000 03   66240000 05   -73796486 04
 00007  -40003054 04  -64927861 03   26007418 01  -52814502 01    31716528 01
 00012   71073831 02  -45892009 01   17792788 04   72507841 00    64322471 00
 00017   27894230 00   13011497 01   17645221 00   19893853 03    57040672 02
 00022   30000000 01   10000000 01   61050400 06   12400000 03    66360000 05
 00027  -67306788 04  -46118641 04  -26587092 03   32095814 01   -49017890 01
 00032   32122642 01   75523068 02  -18762246 01   17850917 04    72506220 00
 00037   64324054 00   27894917 00   12691999 01   17650439 00    20265193 03
 00042   64465381 02   30000000 01   20000000 01   61050400 06    12400000 03
 00047   66442626 05  -64488427 04  -50050253 04   86059569-02    36091008 01
 00052  -46102656 01   32203395 01   78574349 02   62655075-04    17848136 04
 00057   72505103 00   64325145 00   27895389 00   12503466 01    17676457 00
 00062   20466794 03   69793910 02   40000000 01   10000000 01    61050400 06
 00067   12400000 03   66480000 05  -63106939 04  -51747135 04    12032445 03
 00072   37840278 01  -44707064 01   32186864 01   79954200 02    84919689 00
 00077   17835409 04   72504600 00   64325638 00   27895604 00    12426851 01
 00082   17696820 00   20530672 03   72232888 02   40000000 01    10000000 01
 00087   61050400 06   12400000 03   66600000 05  -58240633 04   -56829131 04
 00092   50525547 03   43195633 01  -39915114 01   31910134 01    84398588 02
 00097   35717835 01   17746395 04   72502978 00   64327222 00    27896290 00
 00102   12214996 01   17800656 00   20401376 03   80261651 02    40000000 01
 00107   10000000 01   61050400 06   12400000 03   66720000 05   -52757609 04
 00112  -61309147 04   88483217 03   48117135 01  -34676561 01    31292361 01
 00117   88887750 02   62759688 01   17584556 04   72501357 00    64328800 00
 00122   27896977 00   12054122 01   17981641 00   15622211 03    87433756 02
```

Figure 9. Listing of Sample Orbital Tape Format-3A (TCB) (cont.)

REGULAR OCTAL DUMP OF DR002837.OCT

FILE 1 RECORD 1 1536 BYTES

```
(    0)    000375010001   233444756601   220715204000   000000000000
224440365600   210666000000   220630220000   224440452200
(   48)    211442000000   220625360000   206740000000   204600000000
205520000000   205400000000   211400000000   000000000000
(   96)    000000000000   215624040000   233431523104   232766431012   233407155
(  144)    000000000000   000000000000   000000000000   224440365600   210666000
(  192)    000000000000   166433541052   156462540002   154653325126   152762156
(  240)    000000000000   224440365600   210666000000   220627260000   217661165
(  288)    576710651343   206436156513   176670111431   212576702637   575562404
(  336)    000000000000   000000000000   000000000000   000000000000   000000000
(  384)    000000000000   000000000000   000000000000   000000000000   000000000
(  432)    000000000000   000000000000   000000000000   000000000000   000000000
(  480)    000000000000   000000000000   000000000000   000000000000   000000000
(  528)    000000000000   000000000000   201400000000   000000000000   000000000
(  576)    000000000000   000000000000   000000000000   000000000000   000000000
(  624)    177440245536   576601360131   200657230745   200470357214   600764612
(  672)    201512013242   200717674430   173632773315   200717674430   200477551
(  720)    175703740022   175653270204   162445652542   562460762360   206707441
(  768)    000000000000   000000000000   000000000000   207402374113   211654257
(  816)    214405012541   214456663623   214553233353   214635220732   215443211
(  864)    000000000000   000000000000   000000000000   000000000000   000000000
(  912)    546405240217   147406441546   550465410014   147577116711   545436133
(  960)    146624071434   547527005775   000000000000   000000000000   000000000
( 1008)    000000000000   000000000000   000000000000   000000000000   000000000
( 1056)    000000000000   000000000000   000000000000   000000000000   000000000
( 1104)    000000000000   000000000000   000000000000   000000000000   000000000
( 1152)    204400000000   203700000000   204700000000   205720000000   000000000
( 1200)    202600000000   000000000000   000000000000   000000000000   000000000
( 1248)    000000000000   000000000000   000000000000   000000000000   000000000
( 1296)    000000000000   000000000000   000000000000   000000000000   000000000
( 1344)    000000000000   000000000000   000000000000   000000000000   000000000
( 1392)    000000000000   000000000000   000000000000   000000000000   000000000
( 1440)    000000000000   000000000000   000000000000   000000000000   000000000
( 1488)    000000000000   000000000000   000000000000   000000000000   000000000
( 1536)
```

REGULAR OCTAL DUMP OF DR002837.OCT

FILE 1 RECORD 208 1536 BYTES

```
(    0)    000375010001   201400000000   224440366200   210672000000
216715200000   216513460677   210431665612   616467550163
(   48)    602404042312   203425740310   203412601711   605432305036
606532370532   216400070333   600564304653   200513636304
```

(96)	177437623137	202706545337	174412561623	211540237675	604404145
(144)	210672000000	216717100000	216507552257	211621345104	616457641
(192)	605407374514	606527137124	215760044042	600564306756	200513634
(240)	211541425325	603751264206	202400000000	201400000000	224440366
(288)	212512703152	616447616307	602431777317	203425406711	203424731
(336)	600564311061	200513632216	177437617501	202664005466	174446115
(384)	201400000000	224440366200	210672000000	216722700000	216477343
(432)	203425040243	203432164605	604700234300	606517602537	215717417
(480)	202652367212	174465260303	211544055644	603643217146	202400000
(528)	216724600000	216473032736	213447233043	616427172436	602461710
(576)	606513452544	215677113641	600564315267	200513626130	177437614
(624)	603573707072	202400000000	201400000000	224440366200	210672000
(672)	616416565360	602476512254	203423460241	203445226257	604555251
(720)	200513624075	177437612223	202627032672	174527112353	211546606
(768)	224440366200	210672000000	216730400000	216461555603	213650361
(816)	203453040161	604502133067	606502153770	215636137161	600564321
(864)	174551756573	176466263064	603443271604	202400000000	201400000
(912)	216454577650	213750526516	615772320626	602531735637	203421157
(960)	215615474320	600564323577	200513620007	177437606565	202603110
(1008)	202400000000	201400000000	224440366200	210672000000	216734200
(1056)	602550422313	203417477216	203467055212	603720672271	606467224
(1104)	177437604746	202571012446	174624045014	202605021327	602570326
(1152)	210672000000	216736100000	216442136051	214463767614	615725745
(1200)	603563451664	606461131715	215554264134	600564330005	200513613
(1248)	203442627071	602404661175	202400000000	201400000000	224440366
(1296)	214523355213	615703125166	602607663072	203413352473	203503613
(1344)	600564332110	200513611667	177437601307	202544364062	174705111
(1392)	207614000000	206730000000	212763400000	000000000000	000000000
(1440)	000000000000	000000000000	000000000000	000000000000	000000000
(1488)	000000000000	000000000000	000000000000	000000000000	000000000
(1536)					