ISEE / ICE / IMP NEWSLETTER

OCT, NOV, DEC 1992

I. IMP ISSUES

Optical Aspect

The magnetometer team reports an increase in the occurrence of bad "see sun" times, indicating possible deterioration of the optical aspect sensor. The mag team expects to be able to work around the problem at its present level. You might be on the lookout for effects of this problem in your recent data.

IMP Data Recovery

It has been noted that there are some increased quality problems being seen in IMP-8 data since about mid-1992. Symptoms are seen not only in the data going to PIs but also e.g. in the data recovery statistics generated by the Information Processing Division (IPD) at Goddard. These IPD statistics show that the problem recurring periodically for about 1-2 days each at the IMP-8 orbital frequency of 12.5 days and correlated with IMP-8 perigee. Problems are being seen in data from all IMP ground stations to varying degrees. The amount of data being fully lost is not completely clear, since not all PI codes are equally robust in recovering useful data during times of poor data quality. But the IPD statistics show 20% or more loss of data nominally taken during the affected 1-2 days per orbit. That IMP-8 perigee from mid-1992 until now has been primarily in the solar wind and that IMP-8 plays a new and unique support role as a source of solar wind data for Geotail since mid-1992 precisely is of significant concern. We do note much valuable correlative IMP-8 data has still been taken in support of Geotail as well as e.g. the Ulysses Jupiter encounter (see Lepping et al, 1992, NASA/GSFC/LEP Report) and the December 8th Galileo Earth encounter.

The problem is being approached in two parts, one to understand the underlying reason behind what is presumably a lower

signal/noise ratio near perigee and a second in whether any ground procedures or equipment may be less than optimally tuned for the maximum recovery of such data. With respect to the underlying problem, the path we are pursuing is that of the old IMP-8 antenna problem. Those who have been with IMP-8 from launch may recall that there was an up-down asymmetry in the antenna pattern, such that a better signal strength is seen looking at the (physical) bottom of the spacecraft. IMP-8 was flipped (i.e., the spin vector alignment with the GSE Z axis was reversed by 180 deg) shortly after its September 1973 launch to improve its aspect at apogee. In late 1992, IMP-8 is at its most northerly ecliptic latitude near perigee, with that maximum latitude to continue to very slowly increase for the next few years, and with the "weaker" aspect of the spacecraft exposed at these northern latitudes. We presently speculate IMP-8 has just gotten far enough north and is still far enough out at perigee that the stations are just starting to fall a little below their effective current capabilities for an IMP-8 orbit and VHF frequencies. Whether there are ground operational procedures or other measures that can be taken to better cope with the loss of signal strength is still being explored.

Analysis of the problem and possible corrective actions is continuing. The point of maximum ecliptic latitude will separate in time from perigee in the next months enough that they can start to be distinguished. Of course, this implies the maximum latitude will be occurring at larger distances and may exacerbate the data reception problems further. Several different checks seem to indicate the IMP-8 orbit predictions remain sufficiently accurate (based on extrapolation from the last range-rate measurements that could be made in 1978) that they are not the source of the problem. A separate preliminary analysis of IMP-8 power shows it still adequate with respect to the telemetry system and likely to be able to sustain simultaneous operation of all existing experiments for at least a few more years. We would encourage PIs to also carefully consider whether any changes in their reduction and analysis s/w could allow them better able to get the maximum from the data they do receive.

II. DATA PROCESSING

A. Most current data shipped as of January 6, 1993

	(GROUP # - DAY/YEAR) IMP-8	ICE
DECOM	1718 - 314/92	749 - 348/92
MCE	1718 - 314/92	n/a

B. Whole groups not shipped which precede those above:

None

C. Requested redo's in progress:

IMP-8 Groups 1705 MCE (X-53)
ICE None

III. FUTURE PLANS

IMP-8 20th Anniversary Plans

The 20th IMP launch anniversary is approaching. The proposed recognition event is a party at the Goddard Recreation Center on Tuesday evening, May 25, during the AGU/Baltimore week. Please let Joe King know if you expect to be in town for that meeting and are likely to attend the proposed function. Joe's SPAN address is NFC::KING.

IV. OPERATIONS

ICE

There were 81 real time passes with 3 commands transmitted to the ICE spacecraft, with a 18.0 percent coverage rate during this quarter.

The ICE-ULYSSES radial line up started on October 9 and ended on November 2, 1992, with 203 hours and 51 minutes of ICE data recovered.

The ICE/IMP Transportable Payload Operations Control Center (TPOCC) is the computer system being used for both the ICE and the IMP spacecraft in the Multi-Satellite Operation Control Center (MSOCC). Release 5.1 is the operational software being used in the TPOCC system. The TPOCC system has been used for operations since November 6, 1992. The PDP 11/70 is no longer being used for either spacecraft.

IMP-8

There were 91 real time passes with 348 commands transmitted to the IMP-8 spacecraft with a 66.1 percent coverage rate during this quarter.

The spacecraft was expected to experience an Earth eclipse on October 11,1992 from approximately 1656Z to 1846Z. All experiments were turned off on October 11 by 0903Z. No station had visibility during the predicted eclipse period. When reacquired, the spacecraft had not turned off, indicating no eclipse, or a very small eclipse. All experiments were turned back on, on October 12, 1992, and appear to be functioning properly.

The Hawaii station used to support IMP was severely damaged during Hurricane Iniki in September and was out of operation until October 26, 1992. Scheduled Hawaii support was scheduled at other stations where possible.

IMP-8 support was maximized on November 22-26, December 7 and 8, and December 17,18,21,22, and 23 to coincide with a campaign at the Sondrestrom Incoherent Scatter Radar Facility. A 72.25 percent telemetry coverage rate of IMP-8 data was accomplished during the periods requested.

IMP-8 support was maximized on October 18 through 21, on November 10 through 15, and November 20, to provide solar wind magnetic field and plasma data, during the time the Geotail spacecraft was in the Earth's magnetotail. A 55.67 percent telemetry coverage rate of IMP- 8 data was accomplished during these time periods.

IMP-8 support was maximized on December 7,8 and 9 to coincide with the Galileo spacecraft's flyby of the Earth to provide a gravity-assist to propel Galileo toward Jupiter. A 74.4 percent telemetry coverage rate of IMP-8 data was accomplished during this period.

DATA

The overall telemetry coverages for this quarter were:

	October	November	December
ICE	28.4%	16.3%	9.3%
IMP-8	63.4%	65.2%	70.8%

DETAILS OF THE COVERAGES FOR ICE AND IMP-8 ARE LISTED IN ATTACHMENT "A".

ATTACHMENT A

DATA COVERAGE FOR OCTOBER 1, 1992 (275)
THROUGH DECEMBER 31,1992 (366).

DDD HH-MM IN UT

	ICE	IMP
275	0515-0915	0000-2400
276	1145-1715 2230-2400	0000-1634 1700-2139
277	0000-0315	0118-2206
278	1125-1525	0632-2400
279	2130-2400	0000-0533 1315-2112 2304-2400
280	0000-0300 1140-1530	0000-0002 0109-0817 1346-2345
281	NONE	0008-0248 1729-2345
282	NONE	1841-2345
283	0926-1126 1131-1520 1950-2400	0310-0344 0402-0505 2009-2330
284	0000-0300 0727-1100	0003-0656 1902-2334 2339-2400
285	NONE	0000-0930 2332-2400
286	0830-1245 1935-2400	0000-1202 1737-2400
287	0000-0115 1150-1610	0000-1604 1657-2400
288	1150-1655 1945-2345	0000-2024 2115-2400

289	0745-1400 1955-2345	0000-2113 2152-2254
290	1141-1930 2015-2345	0046-2114
291	1918-2345	0754-2051
292	0530-1725 1939-2400	1245-2022
293	0000-0100 0510-1200 1925-2159 2203-2345	0114-0500 0530-1330 1516-1730 1745-2134
294	1620-2400	1739-2245
295	0000-0045 1150-1550 1945-2400	0518-1318 1838-2245 2329-2400
296	0000-0045 1625-2230	0000-0511 1805-2400
297	1200-1550 1945-2400	0000-0801 1734-2400
298	0000-0245 1805-2230	0000-1024 1657-2400
299	0430-1115 1200-1955	0000-1333 2326-2400
300	0435-0936 0940-1145 1205-1805	0000-2400
301	0435-1015 1315-1605	0000-2012
302	1915-2310	0047-2026
303	1205-1545 1940-2345	0521-2014 2113-2200
304	1205-1645	0243-0840 1245-1918
305	1020-1445	1302-2003
306	1400-2220	1624-2230

307	0445-1045 1210-1600	1704-2245 2300-2400
308	NONE	0000-0316 1809-2400
309	NONE	0000-0633 1658-2400
310	NONE	0000-2400
311	0738-0801 0806-1130 1900-2400	0000-1134 1538-2400
312	0000-0225 1845-2333 2341-2400	0000-2400
313	0000-0230	0000-1905 2133-2400
314	0730-1430	0000-2400
315	1520-2020	0000-0059 0314-2400
316	NONE	0000-0100 0745-1201 1241-2400
317	NONE	0000-0100 1245-1850 2207-2400
318	1850-2250	0000-0100 1513-2124
319	2038-2400	0323-1123 1618-2230
320	0000-0115	0156-1000 1804-2124 2126-2400
321	1615-1900 1910-2345	0000-0505 0545-1345 1730-2400
322	1850-2240	0000-1520 1533-2400

323	NONE	0000-2400
324	1905-2212 2238-2400	0000-1332 1416-2400
325	0850-1415	0000-2400
326	1845-2345	0000-2000
327	0845-1345	0058-1841
328	NONE	0538-2400
329	NONE	0000-0105 1245-1755 2028-2400
330	1835-2235	0000-0147 1352-1958
331	NONE	1521-2245
332	1300-1603 1620-1810 1845-2400	1648-2400
333	0000-0045 1845-2345	0000-0333 1541-2400
334	NONE	0000-0555 1452-2400
335	0815-1700	0000-0806 1418-2400
336	NONE	0000-1115 2056-2400
337	NONE	0000-2400
338	NONE	0000-1744 1800-2254 2323-2400
339	NONE	0000-2342
340	0750-1310 1830-2245	0416-1725
341	NONE	1200-1700

342	0529-1015	1233-1836 2304-2400
343	0530-0945	0000-0825 0830-1341 1426-2400
344	NONE	0000-1446 1530-2400
345	NONE	0000-0203 1508-2400
346	NONE	0000-1055 1412-2400
347	NONE	0000-0643 1336-2400
348	1929-2130	0000-0935 1303-2400
349	NONE	0000-2400
350	NONE	0000-1652 1800-2039 2210-2400
351	NONE	0000-2257
352	1630-2045	0321-2320
353	NONE	1200-1607 1809-2353
354	NONE	1200-1729
355	0020-0445 0545-1105 1255-1730	1337-2117
356	NONE	0700-1358 1425-2400
357	NONE	0000-0047 0624-1340 1431-2400
358	0610-1010	0000-0956 1327-2400
359	NONE	0000-0544

		1248-2400
360	2000-2400	0000-0844 1212-2400
361	0000-0100 0610-0904 0911-1042 1830-2245	0000-2400
362	1830-2245	0000-1607 2157-2400
363	0615-1030	0000-1611 1800-2400
364	NONE	0257-1544 1800-2233
365	NONE	1215-1519 1723-2305
366	0610-1015	1215-1638 2120-2400