

A catalogue of Jovian decametric radio observations from January 1988 to December 1990

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Abstract. — The Nancay observations of Jupiter were started in January 1978; this catalogue is the 5th to be published, and the whole set of observations extends now over more than one Jovian revolution. Each catalogue lists all Jupiter decameter emissions recorded with the Nancay radio spectrograph for two or three years. Jupiter is tracked 8 hours daily throughout the year in the frequency range 10-40 MHz. For each observing day we list the characteristics of the observations, and of the emissions (starting and ending times, central meridian longitude and Io phase, frequency range). Statistics on the probability of occurrence, and on the extension of the sources in longitude, show a good relationship with D_E , the Jovicentric declination of the Earth. Results are also given on the drift of the centroids of the sources in longitude and Io phase with increasing D_E . The results are explained by the geometry of the radiation beams of the Io-A and Io-B sources as viewed from the Earth, and confirm the hollow cone source model. In addition our results are consistent with those already published for observations made from 1957. They show that the system III (1965) rotation period of Jupiter is valid.

Key words: Jupiter — radio emission

1. Introduction

In France, at the Nancay station, a radio spectrograph has been monitoring Jupiter since January 1978. Four catalogues have been published covering the period 1978-1979, 1980-1981, 1982-1984 and 1985-1987 (Leblanc et al. 1981; Leblanc et al. 1983; Leblanc et al. 1989; Leblanc et al. 1990) were already published. At the present time it is the only radio spectrograph monitoring Jupiter daily. It provides a large homogeneous data set giving information on the long-term stability of the Jovian magnetosphere. Moreover this program, in relationship with Ulysses and Galileo Missions would increase the scientific understanding of the Jovian system.

The extensive survey carried out by the Decameter Radio Astronomy Group has been especially important for comparative studies of Jovian events observed simultaneously from Nancay station and from the Voyager spacecraft with the Planetary Radio Astronomy experiment (Poquerusse and Lecacheux 1978; Leblanc & Genova 1981; Barrow et al. 1982; Genova & Aubier 1985; Genova & Calvert 1988). It has been also a good tool for studying the variability of the Jovian Decametric radiation (Genova et al. 1987; Boudjada & Leblanc 1992).

This catalogue covers the period 1988-1990. In the first section the equipment and the observations are briefly described; in the second section, the catalogue is listed, followed by the occurrence diagrams of the observations and emissions. In the last section we give some statistical results which can be interpreted in terms of beaming; conclusions on the rotation period are also given.

2. Equipment and observations

The instrumentation consists of a large collecting array of 144 "Tee-Pee" antennas providing a gain of 24 db in both left-hand and right-hand polarization of the incoming waves (Boischot et al. 1980). The sensitivity with a time constant of 1 sec and an elementary bandwidth of 250 kHz is $8 \cdot 10^{-22} \text{ Wm}^{-2}\text{Hz}^{-1}$. The array is electronically fully steerable and the tracking is about 4 hours on each side of the source meridian transit at Nancay. The array is connected to several swept-frequency spectrographs with different time and spectral resolutions. Jupiter is tracked 8 hours daily throughout the year, in the frequency range 10-40 MHz during nighttime observations, and 20-40 MHz

during daytime observations. Since 1990, all the data has been digitalized and stored in an optical disk.

3. The catalogue

The data are divided into two parts: on the left they correspond to the observations, and on the right to the emissions. For each observing day the catalogue lists the data (Year, Month, Day), the day of year, the beginning and the end of the observing times (hours, minutes), the calculated central meridian longitude (CML) (System III in degrees), the Io phase (in degrees) and the bandwidth within which the observations were carried out (in MHz).

When an emission was observed, we give the starting and ending times (hours, minutes,) the calculated CML and Io phase (degrees) and the frequency range in which this emission occurred (the lowest frequency is generally not intrinsic to the Jovian emission during daytime observations, due to interferences). When an emission or an observation spaned 2400 UT., the two corresponding days are indicated with a cut at 2400 UT. When several emissions were observed during the same day, and if they are separated by more than 15 minutes, they are listed separately and the characteristics of the observations are not repeated. Fig. 1 shows the observation tracks for one year (1988) and Fig. 2 shows the emission tracks plotted for the data set 1978-1988. We have indicated the well-known Io-A, Io-B and Io-C sources. The Io-A' source as defined by Leblanc (1981) with particular spectral characteristics, and occurring in the range 160-200° of Io phase, is clearly seen.

4. Statistical results over one Jovian revolution (1978-1988)

The Jupiter decametric emissions are studied by means of histograms of occurrence probability for intervals of 2° in the Jovian system III longitude (CML) and Io phase. The probability of occurrence is the ratio between the emission time to the observing time for each 2° bin. Boudjada & Leblanc (1992) reported the occurrence probability versus CML and Io phase. Their results are shown in Fig. 3. We note in Fig. 3a, a variation of the occurrence probability and of the width of the sources, and a drift in longitude of the peaks from one year to the other. This is due to the viewing geometry of Jupiter from the earth; a variation of the Jovian declination of the earth (D_E) affects all these 3 parameters as already shown by Gulkis & Carr (1966). Fig. 3b shows the probability of occurrence in Io phase with the Io-B source at about 90°, and Io-A and Io-C sources at about 240°. We note also the drift in Io phase of these sources with D_E .

4.1. Beaming of the emission

Carr et al. (1970) reported a relationship between the occurrence probability of the emission and D_E . They found that the ratio between the occurrence probability at D_E maximum (+3.3°) and D_E minimum (-3.3°) was in the range of 3.5-6 for the A source at peak longitude = 245°, and 3.1 for the B source at peak Io phase = 90°. Boudjada & Leblanc (1992) made statistics over the last Jovian revolution period on the occurrence probability versus D_E for the A and B sources. They find that the ratio between maximum probability and minimum probability is equal to 4.3 for the A source and 3.1 for the B source. Therefore an increase in D_E causes an increase in the probability of emission. This can be understood if the radiation beam is larger for the highest values of positive D_E .

4.2. Width of the beaming in longitude and drift of the centroid of the sources

For the purpose of this paper we define the width of the beam of radiation to be the halfwidth of the A source, where the amplitude is defined as the level of peak emission probability minus the probability level of the null preceding the A source.

Boudjada & Leblanc (1992) found that at D_E -3.3° the beam extends over the longitude range 200-260°, and at D_E +3.3°, it extends over the range 210-300° CML. Therefore the width of the beam is 50 % wider at D_E maximum than at D_E minimum. In addition, the occurrence probability at D_E maximum is about 4 times higher than at D_E minimum. This is an indication that the average radiation intensity is not constant across the beam. We note also that the edges of the beam do not widen symmetrically: the leading edge drifts very little with D_E while the trailing edge drifts markedly by about 40°.

When considering the centroid of the source as defined by the peak probability of occurrence, we note a drift in longitude for the A source with increasing D_E . This drift can be described by the following relationship:

$$\text{CML of the Io-A source} = 4^\circ \times D_E + 243^\circ$$

For the B source the drift is not significant.

4.3. Width of the beam in Io phase and drift of the centroid

The same analysis as above was made to determine the half-width of the beam in Io phase for the A, B and C sources. Boudjada & Leblanc (1992) found that the beams widen with increasing D_E for the 3 sources, but only the inner edges drift with increasing D_E .

The drift in Io phase for the 3 sources was also derived. This drift is negligible for the A source, but is significant for the two other sources. We find the following relationships:

$$\begin{aligned}\phi_{\text{Io-B}} &= -3.1^\circ D_E + 88^\circ \\ \phi_{\text{Io-C}} &= -3.1^\circ D_E + 88^\circ\end{aligned}$$

The drift in Io phase was first noted by Conseil (1972), and then confirmed by Lecacheux (1974) and Thieman & Smith (1975). It has been interpreted by Desch (1978) as an effect of the beaming of the Io-B source in the northern hemisphere and of the Io-C source in the southern hemisphere.

5. Conclusions

Statistics over an eleven-year (1978-1988), homogeneous series of spectral observations at Nancay observatory confirm the increase with D_E of the probability of occurrence, and of the beamwidth in longitude. Both phenomena can be explained on the basis of beaming of the escaping radiation. These results confirm the hollow cone beaming model as first suggested by Dulk (1967), with sources localized in longitude and corotating with the planet. The centroids of the sources are found to drift positively in longitude by some 5° with increasing D_E , and to drift negatively in Io phase by about 2° with increasing D_E . All these results are consistent with previous studies undertaken with different set of observations, and they show that the system III of the rotation period is valid.

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References

- Barrow C.H., Lecacheux A. and Leblanc Y. 1982, A&A 106, 94
- Boisshot A., Rosolen C., Aubier M.G., Daigne G., Genova F., Leblanc Y., Lecacheux A., De La Noe J. and Pedersen B.M. 1980, Icarus 43, 399
- Boudjada M.Y. and Leblanc Y. 1992; Adv. in Space Res. 12, 895
- Carr T.D., Smith A.G., Donnivan F.F., Register H.I. 1970, Radio Sci 5, 495
- Conseil L. 1972, These de 3 em Cycle, Paris
- Desch M.D. 1978, Nat. 272, 111
- Dulk G.A. 1967, Icarus 7, 173
- Genova F. and Calvert W. 1988, J. Geophys. Res. 93, 979
- Genova F. and Aubier M.G. 1985, A&A 150, 139
- Genova F., Zarka P. and Lecacheux A. 1987, in Time variable phenomena in the Jovian system, ed. M.J.S. Belton, NASA SP-494, 156
- Gulkis S. and Carr T.D. 1966, Nat. 154, 257
- Leblanc Y. 1981, J. Geophys. Res. 86, 8546
- Leblanc Y. and Genova F. 1981, J. Geophys. Res. 86, 8564
- Leblanc Y., De La Noe J., Genova F., Gerbault A. and Lecacheux A. 1981, A&AS 46, 135
- Leblanc Y., Gerbault A., Rubio M. and Genova F.: 1983, A&AS 54, 135
- Leblanc Y., Gerbault A. and Lecacheux A. 1989 A&AS 77, 425
- Leblanc Y., Gerbault A., Lecacheux A. and Boudjada M.Y., 1990, A&AS 86, 191
- Lecacheux A. 1974, A&A 37, 301
- Poquerusse M. and Lecacheux A. 1978, A&A 275, 111
- Thieman J.R., Smith A.G. 1975 ApJ 16, 83

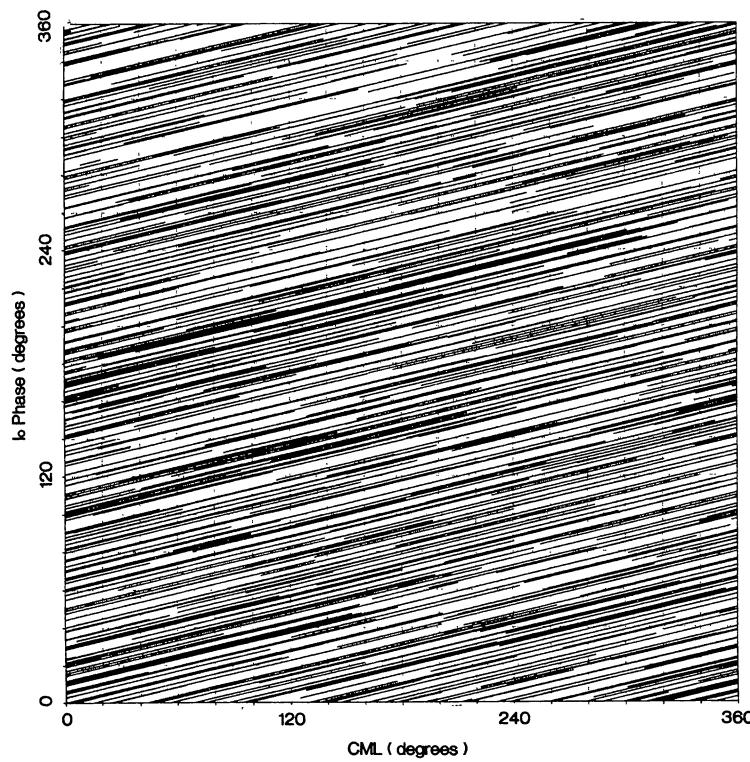


Fig. 1. The observation tracks for one year observations (1988)

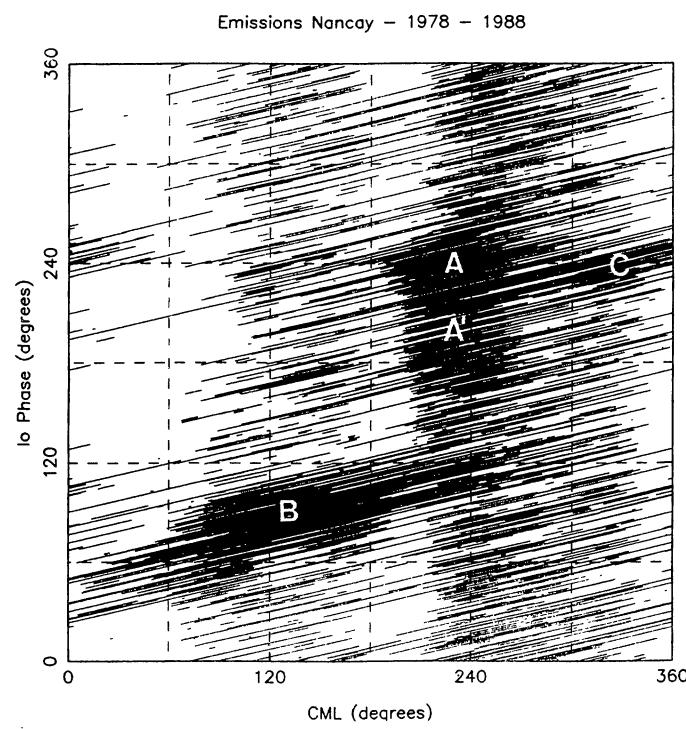


Fig. 2. The emission tracks for 11 years of observations (1978 to 1988)

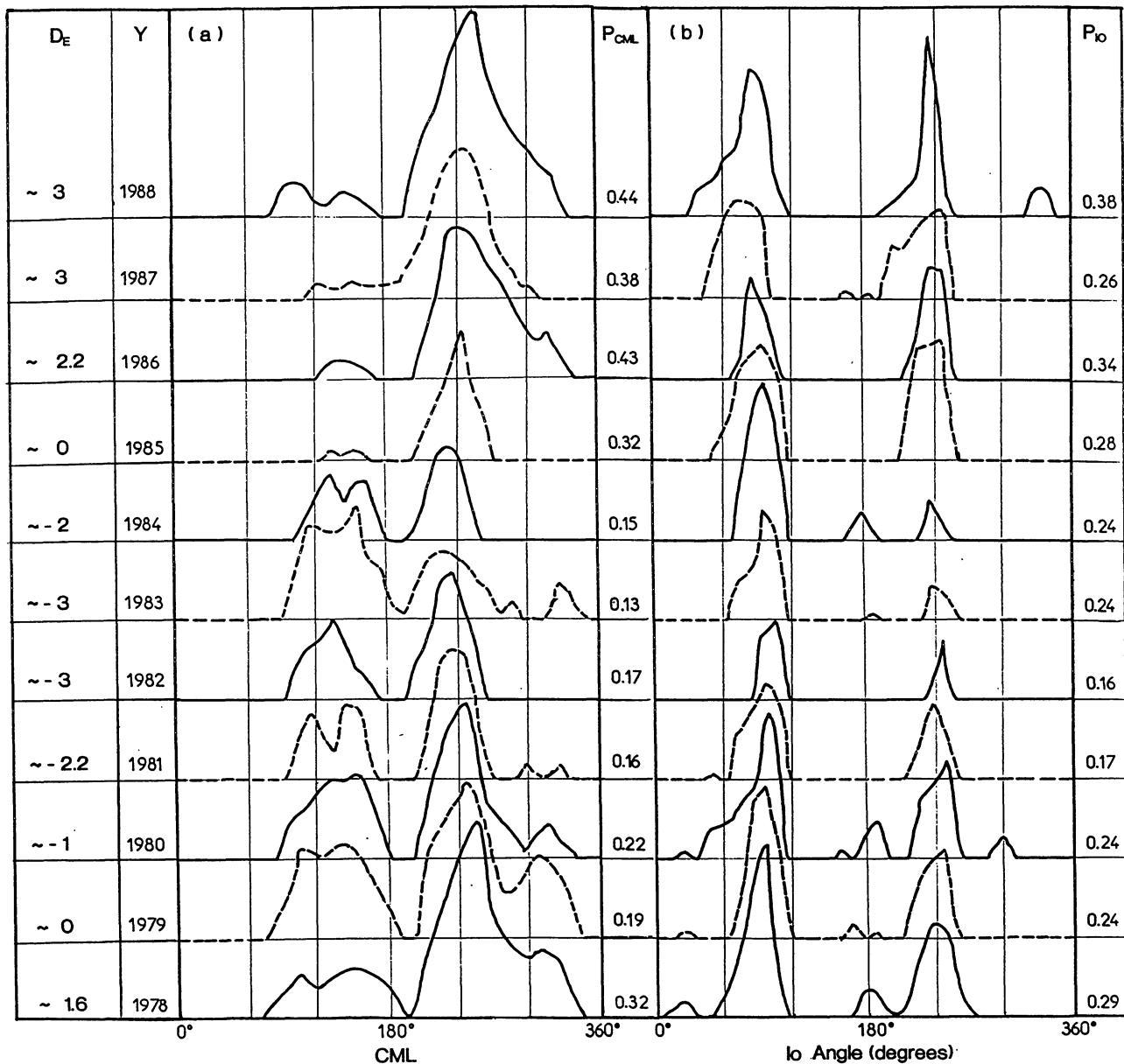


Fig. 3. The occurrence probability, (a) in CML, (b) in Io Phase. The Jovicentric declination of the Earth D_E is indicated on the left column; the values of probability of the peaks at $CML \approx 240^\circ$ (P_{CML}), and at Io phase $\approx 90^\circ$ (P_{Io}) are given on the right columns (after Boudjada & Leblanc 1992)

Catalogue.

| DATE YY/MM/DD | DOY JJJ | TIME UT HHMM - HHMM | OBSERVATIONS | | | | EMISSIONS | | | | |
|------------------|------------|------------------------|---------------------|-----------|---------|--------------|------------------------|---------------------|---------|-------|--------------|
| | | | CML III (1965.8) | IO | PHASE | WIDTH MHZ | TIME UT HHMM - HHMM | CML III (1965.8) | IO | PHASE | WIDTH MHZ |
| 88/ 1/ 4 | 4 | 15 8 - 2214 | 339 - 242 | 94 - 156 | 15 - 48 | 1817 - 1916 | 249 - 284 | 326 - 334 | 18 - 29 | | |
| 88/ 1/ 5 | 5 | 1621 - 2218 | 179 - 29 | 389 - 358 | 15 - 48 | 1941 - 1946 | 299 - 382 | 337 - 338 | 15 - 19 | | |
| 88/ 1/ 6 | 6 | 1618 - 22 5 | 327 - 177 | 152 - 281 | 15 - 48 | 2014 - 2816 | 319 - 321 | 342 - 342 | 15 - 18 | | |
| 88/ 1/ 7 | 7 | 1654 - 22 3 | 139 - 326 | 1 - 44 | 15 - 48 | 1921 - 2846 | 78 - 129 | 178 - 198 | 18 - 25 | | |
| 88/ 1/ 8 | 8 | 15 5 - 22 8 | 224 - 115 | 189 - 247 | 15 - 48 | 1924 - 2115 | 238 - 297 | 22 - 37 | 17 - 23 | | |
| 88/ 1/ 9 | | | | | | 1510 - 1542 | 227 - 246 | 189 - 194 | 22 - 27 | | |
| 88/ 1/ 10 | | | | | | 1825 - 1831 | 345 - 348 | 217 - 219 | 15 - 17 | | |
| 88/ 1/ 11 | 11 | 1627 - 2149 | 4 - 198 | 98 - 136 | 15 - 48 | 1832 - 1911 | 88 - 184 | 188 - 114 | 21 - 29 | | |
| 88/ 1/ 12 | 12 | 1624 - 2145 | 153 - 347 | 293 - 339 | 15 - 35 | | | | | | |
| 88/ 1/ 13 | 13 | 17 8 - 2139 | 325 - 134 | 142 - 181 | 15 - 48 | 28 7 - 2126 | 78 - 126 | 168 - 179 | 17 - 26 | | |
| 88/ 1/ 14 | 14 | 1618 - 2139 | 98 - 283 | 339 - 24 | 15 - 48 | 28 1 - 2135 | 225 - 282 | 11 - 24 | 28 - 38 | | |
| 88/ 1/ 15 | 15 | 1335 - 2135 | 142 - 72 | 168 - 227 | 15 - 48 | 1519 - 19 8 | 285 - 338 | 174 - 285 | 17 - 33 | | |
| 88/ 1/ 16 | 16 | 1335 - 2135 | 292 - 222 | 3 - 71 | 15 - 48 | 1736 - 18 3 | 78 - 94 | 37 - 41 | 18 - 24 | | |
| 88/ 1/ 17 | 17 | 1335 - 2135 | 83 - 13 | 286 - 274 | 15 - 48 | 1642 - 1929 | 196 - 297 | 233 - 256 | 18 - 37 | | |
| 88/ 1/ 18 | 18 | 15 5 - 2125 | 287 - 158 | 62 - 116 | 15 - 48 | | | | | | |
| 88/ 1/ 19 | 19 | 15 5 - 2126 | 78 - 388 | 266 - 320 | 15 - 48 | 1955 - 2823 | 253 - 278 | 387 - 311 | 18 - 26 | | |
| 88/ 1/ 20 | 20 | 15 5 - 2117 | 228 - 93 | 189 - 162 | 15 - 48 | 1726 - 18 1 | 313 - 334 | 129 - 134 | 17 - 23 | | |
| 88/ 1/ 21 | 21 | 13 6 - 21 6 | 247 - 177 | 342 - 58 | 15 - 48 | | | | | | |
| 88/ 1/ 22 | 22 | 13 6 - 21 6 | 37 - 328 | 186 - 254 | 15 - 48 | 1733 - 1834 | 199 - 236 | 223 - 232 | 18 - 31 | | |
| 88/ 1/ 23 | 23 | 14 2 - 21 8 | 222 - 114 | 37 - 96 | 15 - 48 | | | | | | |
| 88/ 1/ 24 | 24 | 14 2 - 21 8 | 222 - 114 | 37 - 96 | 15 - 48 | | | | | | |
| 88/ 1/ 25 | 25 | 14 2 - 21 8 | 222 - 114 | 37 - 96 | 15 - 48 | | | | | | |
| 88/ 1/ 26 | 26 | 1313 - 28 5 | 342 - 231 | 233 - 292 | 15 - 48 | | | | | | |
| 88/ 1/ 27 | 27 | 1313 - 1618 | 133 - 248 | 77 - 182 | 15 - 48 | 13 5 - 1448 | 128 - 185 | 76 - 89 | 18 - 29 | | |
| 88/ 1/ 28 | 28 | 1249 - 1548 | 269 - 17 | 277 - 302 | 15 - 48 | | | | | | |
| 88/ 1/ 29 | 29 | 1245 - 2846 | 56 - 347 | 119 - 187 | 15 - 48 | 1456 - 15 9 | 136 - 143 | 138 - 148 | 28 - 29 | | |
| 88/ 1/ 30 | 30 | 1245 - 2846 | 287 - 137 | 323 - 31 | 15 - 48 | 1734 - 1815 | 231 - 256 | 168 - 166 | 28 - 28 | | |
| 88/ 1/ 31 | 31 | 1245 - 2846 | 357 - 288 | 166 - 234 | 15 - 48 | 1744 - 1427 | 242 - 268 | 331 - 337 | 28 - 24 | | |
| 88/ 2/ 1 | 32 | 15 5 - 2836 | 132 - 72 | 29 - 76 | 15 - 48 | 1822 - 1944 | 281 - 258 | 214 - 225 | 18 - 38 | | |
| 88/ 2/ 2 | 33 | 16 8 - 2832 | 68 - 228 | 241 - 279 | 15 - 48 | 1538 - 1551 | 247 - 268 | 33 - 36 | 18 - 25 | | |
| 88/ 2/ 3 | 34 | 1258 - 1415 | 96 - 142 | 58 - 69 | 15 - 48 | 16 7 - 1618 | 269 - 271 | 38 - 38 | 18 - 24 | | |
| 88/ 2/ 4 | 35 | 1247 - 2825 | 248 - 156 | 268 - 324 | 15 - 48 | | | | | | |
| 88/ 2/ 5 | 36 | 1222 - 15 8 | 15 - 118 | 188 - 122 | 15 - 48 | | | | | | |
| 88/ 2/ 6 | 37 | 1222 - 2821 | 165 - 95 | 383 - 18 | 15 - 48 | | | | | | |
| 88/ 2/ 7 | 38 | 1222 - 2822 | 315 - 245 | 146 - 214 | 15 - 48 | | | | | | |
| 88/ 2/ 8 | 39 | 12 8 - 1955 | 247 - 178 | 191 - 257 | 15 - 48 | | | | | | |
| 88/ 2/ 9 | 40 | 12 4 - 28 5 | 35 - 326 | 34 - 181 | 15 - 48 | | | | | | |
| 88/ 2/ 10 | 41 | 12 4 - 28 5 | 35 - 326 | 34 - 181 | 15 - 48 | | | | | | |
| 88/ 2/ 11 | 42 | 1335 - 28 2 | 241 - 115 | 258 - 384 | 15 - 48 | 1335 - 1359 | 241 - 255 | 258 - 253 | 19 - 35 | | |
| 88/ 2/ 12 | 43 | 12 2 - 28 8 | 335 - 264 | 88 - 147 | 15 - 48 | 1914 - 1928 | 236 - 244 | 141 - 143 | 28 - 24 | | |
| 88/ 2/ 13 | 44 | 12 8 - 28 2 | 124 - 55 | 283 - 351 | 15 - 48 | 1655 - 1725 | 302 - 328 | 325 - 329 | 16 - 23 | | |
| 88/ 2/ 14 | 45 | 12 8 - 28 8 | 274 - 284 | 126 - 194 | 15 - 48 | 1736 - 1737 | 117 - 118 | 174 - 174 | 16 - 26 | | |
| 88/ 2/ 15 | 46 | 1358 - 1949 | 131 - 348 | 345 - 36 | 15 - 48 | 1648 - 1713 | 234 - 254 | 9 - 14 | 16 - 24 | | |
| 88/ 2/ 16 | 47 | 1145 - 1945 | 206 - 136 | 171 - 238 | 15 - 48 | 1226 - 1248 | 238 - 244 | 176 - 188 | 28 - 25 | | |
| 88/ 2/ 17 | 48 | 1348 - 1611 | 65 - 157 | 38 - 52 | 15 - 48 | | | | | | |
| 88/ 2/ 18 | 49 | 1713 - 1942 | 194 - 284 | 68 - 81 | 15 - 48 | 1832 - 1942 | 242 - 284 | 71 - 81 | 18 - 26 | | |
| 88/ 2/ 19 | 50 | 1414 - 1935 | 27 - 221 | 82 - 127 | 15 - 48 | 1317 - 1522 | 282 - 277 | 238 - 248 | 18 - 35 | | |
| 88/ 2/ 20 | 51 | 1132 - 1935 | 79 - 11 | 262 - 338 | 15 - 48 | 18 8 - 1829 | 168 - 181 | 115 - 118 | 17 - 21 | | |
| 88/ 2/ 21 | 52 | 1132 - 1935 | 229 - 161 | 185 - 173 | 15 - 48 | | | | | | |
| 88/ 2/ 22 | 53 | 1422 - 1926 | 122 - 386 | 333 - 16 | 15 - 48 | 1738 - 1846 | 241 - 282 | 8 - 18 | 18 - 27 | | |
| 88/ 2/ 23 | 54 | 12 4 - 1923 | 189 - 94 | 156 - 218 | 15 - 48 | 1233 - 13 6 | 287 - 227 | 168 - 165 | 19 - 28 | | |
| 88/ 2/ 24 | 55 | 1216 - 1928 | 347 - 243 | 1 - 61 | 15 - 48 | | | | | | |
| 88/ 2/ 25 | 56 | 1116 - 1917 | 181 - 31 | 196 - 264 | 15 - 48 | 1412 - 1537 | 287 - 258 | 221 - 233 | 28 - 32 | | |
| 88/ 2/ 26 | 57 | 1116 - 1917 | 251 - 182 | 39 - 187 | 15 - 48 | 17 8 - 1755 | 99 - 132 | 88 - 96 | 18 - 37 | | |
| 88/ 2/ 27 | 58 | 1116 - 1917 | 41 - 332 | 243 - 311 | 15 - 48 | | | | | | |
| 88/ 2/ 28 | 59 | 1116 - 1917 | 192 - 122 | 86 - 154 | 15 - 48 | | | | | | |
| 88/ 3/ 1 | 60 | 1228 - 19 8 | 171 - 53 | 142 - 198 | 15 - 48 | | | | | | |
| 88/ 3/ 2 | 61 | 1057 - 1857 | 271 - 281 | 333 - 41 | 15 - 48 | | | | | | |
| 88/ 3/ 3 | 62 | 1054 - 1854 | 59 - 349 | 176 - 244 | 15 - 48 | | | | | | |
| 88/ 3/ 4 | 63 | 1051 - 1851 | 288 - 138 | 19 - 87 | 15 - 48 | 1741 - 1812 | 385 - 324 | 233 - 238 | 29 - 33 | | |
| 88/ 3/ 5 | 64 | 1051 - 1851 | 358 - 288 | 222 - 298 | 15 - 48 | 1737 - 1851 | 93 - 138 | 76 - 87 | 28 - 35 | | |
| 88/ 3/ 6 | 65 | 1051 - 1851 | 148 - 78 | 65 - 133 | 15 - 48 | | | | | | |
| 88/ 3/ 7 | 66 | 1130 - 1838 | 112 - 11 | 117 - 178 | 15 - 48 | 1311 - 1338 | 233 - 244 | 85 - 88 | 22 - 29 | | |
| 88/ 3/ 8 | 67 | 1130 - 1838 | 112 - 11 | 117 - 178 | 15 - 48 | 1346 - 1357 | 254 - 261 | 98 - 92 | 22 - 29 | | |
| 88/ 3/ 9 | 68 | 1156 - 1834 | 278 - 159 | 324 - 21 | 15 - 48 | 1356 - 1357 | 281 - 281 | 138 - 138 | 28 - 27 | | |
| 88/ 3/ 10 | 69 | 1032 - 1832 | 18 - 388 | 156 - 224 | 28 - 48 | 1458 - 15 9 | 233 - 245 | 146 - 148 | 28 - 24 | | |
| 88/ 3/ 11 | 70 | 1031 - 1929 | 168 - 133 | 359 - 75 | 15 - 48 | | | | | | |
| 88/ 3/ 12 | 71 | 1025 - 1829 | 314 - 247 | 281 - 278 | 15 - 48 | | | | | | |
| 88/ 3/ 13 | 72 | 1025 - 1829 | 105 - 37 | 45 - 113 | 15 - 48 | | | | | | |
| 88/ 3/ 14 | 73 | 1030 - 1828 | 258 - 182 | 249 - 315 | 15 - 48 | | | | | | |
| 88/ 3/ 15 | 74 | 1123 - 1816 | 88 - 338 | 99 - 158 | 15 - 48 | | | | | | |
| 88/ 3/ 16 | 75 | 1818 - 1818 | 337 - 267 | 136 - 283 | 15 - 48 | 12 8 - 1219 | 187 - 114 | 106 - 187 | 22 - 28 | | |
| 88/ 3/ 17 | 77 | 18 6 - 18 7 | 124 - 55 | 338 - 46 | 15 - 48 | 1254 - 1259 | 135 - 138 | 112 - 113 | 22 - 25 | | |
| 88/ 3/ 18 | 78 | 18 6 - 18 7 | 275 - 285 | 182 - 249 | 15 - 48 | 1454 - 1456 | 288 - 289 | 129 - 129 | 22 - 25 | | |
| 88/ 3/ 19 | 79 | 18 6 - 18 7 | 65 - 356 | 25 - 93 | 15 - 48 | 1618 - 1725 | 199 - 239 | 188 - 197 | 28 - 29 | | |
| 88/ 3/ 20 | 80 | 18 6 - 1758 | 215 - 141 | 228 - 295 | 15 - 48 | 1517 - 1519 | 183 - 184 | 225 - 226 | 28 - 29 | | |
| 88/ 3/ 21 | 81 | 956 - 1755 | 359 - 289 | 78 - 137 | 15 - 35 | 1834 - 1127 | 232 - 264 | 232 - 239 | 22 - 34 | | |
| 88/ 3/ 22 | 82 | 12 4 - 1749 | 17 - 226 | 134 - 183 | 15 - 48 | 1246 - 1321 | 182 - 123 | 94 - 99 | 21 - 35 | | |
| 88/ 3/ 23 | 83 | 1359 - 1746 | 237 - 14 | 354 - 26 | 15 - 48 | | | | | | |
| 88/ 3/ 24 | 84 | 945 - 1746 | 234 - 165 | 161 - 229 | 15 - 48 | 946 - 1836 | 235 - 265 | 162 - 169 | 28 - 27 | | |
| 88/ 3/ 25 | 85 | 1746 - 234 | 24 - 315 | 5 - 73 | 15 - 48 | | | | | | |
| 88/ 3/ 26 | 86 | 1746 - 234 | 213 - 274 | 15 - 48 | | 1838 - 1213 | 287 - 264 | 215 - 229 | 28 - 32 | | |
| 88/ 3/ 27 | 87 | 1828 - 1736 | 196 - 99 | 213 - 274 | 15 - 48 | 1238 - 1242 | 279 - 281 | 232 - 233 | 28 - 27 | | |
| 88/ 3/ 28 | 88 | 18 7 - 1734 | 338 - 248 | 54 - 117 | 15 - 48 | 1259 - 1345 | 292 - 328 | 235 - 242 | 28 - 38 | | |
| 88/ 4/ 1 | 89 | 917 - 1717 | 189 - 119 | 148 - 288 | 15 - 48 | 13 4 - 1548 | 85 - 184 | 79 - 182 | 28 - 37 | | |
| 88/ 4/ 2 | 90 | 917 - 1717 | 339 - 269 | 343 - 51 | 15 - 48 | | | | | | |
| 88/ 4/ 3 | 91 | 917 - 1717 | 129 - 68 | 187 - 254 | 15 - 48 | | | | | | |
| 88/ 4/ 4 | 92 | 917 - 1717 | 129 - 68 | 187 - 254 | 15 - 48 | 1114 - 1259 | 288 - 264 | 28 | | | |

Catalogue. continued

| DATE YY/MM/DD | DOY JJJ | TIME UT HHMM - HHMM | OBSERVATIONS CML III (1965.8) | | | | WIDTH MHZ | TIME UT HHMM - HHMM | EMISSIONS CML III (1965.8) | | | | WIDTH MHZ |
|------------------|------------|------------------------|-------------------------------------|-----------|---------|--|--------------|------------------------|----------------------------------|-------|--|--|--------------|
| | | | IO | PHASE | | | | | IO | PHASE | | | |
| 88/ 4/28 | 118 | 13 8 - 1627 | 154 - 274 | 231 - 259 | 28 - 48 | | | | | | | | |
| 88/ 4/21 | 111 | 13 7 - 1624 | 383 - 62 | 74 - 182 | 15 - 48 | | | | | | | | |
| 88/ 4/23 | 113 | 816 - 1628 | 68 - 8 | 88 - 148 | 15 - 48 | | | | | | | | |
| 88/ 4/24 | 114 | 816 - 1628 | 218 - 151 | 283 - 351 | 15 - 48 | | | | | | | | |
| 88/ 4/25 | 115 | 1222 - 1611 | 157 - 296 | 161 - 193 | 15 - 48 | | | | | | | | |
| 88/ 4/26 | 116 | 946 - 16 8 | 213 - 84 | 342 - 36 | 15 - 48 | | | | | | | | |
| 88/ 4/27 | 117 | 8 5 - 16 5 | 382 - 232 | 171 - 239 | 15 - 48 | | | | | | | | |
| 88/ 4/29 | 119 | 1111 - 16 8 | 355 - 178 | 244 - 285 | 15 - 48 | | | | | | | | |
| 88/ 4/30 | 120 | 756 - 16 8 | 28 - 328 | 68 - 128 | 15 - 48 | | | | | | | | |
| 88/ 5/ 1 | 121 | 756 - 16 8 | 178 - 111 | 263 - 331 | 15 - 48 | | | | | | | | |
| 88/ 5/ 2 | 122 | 13 6 - 1457 | 156 - 223 | 158 - 166 | 15 - 48 | | | | | | | | |
| 88/ 5/ 3 | 123 | 15 5 - 1547 | 385 - 43 | 353 - 16 | 28 - 48 | | | | | | | | |
| 88/ 5/ 4 | 124 | 9 8 - 1544 | 388 - 192 | 162 - 219 | 28 - 48 | | | | | | | | |
| 88/ 5/ 5 | 125 | 815 - 1541 | 71 - 348 | 359 - 62 | 28 - 48 | | | | | | | | |
| 88/ 5/ 6 | 126 | 842 - 1538 | 237 - 129 | 286 - 264 | 28 - 48 | | | | | | | | |
| 88/ 5/ 7 | 129 | 729 - 1538 | 284 - 215 | 85 - 153 | 28 - 48 | | | | | | | | |
| 88/ 5/10 | 130 | 838 - 1527 | 116 - 3 | 298 - 356 | 28 - 48 | | | | | | | | |
| 88/ 5/11 | 131 | 15 5 - 1456 | 167 - 187 | 153 - 178 | 28 - 48 | | | | | | | | |
| 88/ 5/21 | 141 | 758 - 1455 | 381 - 197 | 7 - 67 | 28 - 48 | | | | | | | | |
| 88/ 5/22 | 142 | 658 - 1455 | 59 - 348 | 283 - 278 | 28 - 48 | | | | | | | | |
| 88/ 5/23 | 143 | 658 - 1455 | 218 - 138 | 46 - 114 | 28 - 48 | | | | | | | | |
| 88/ 5/24 | 144 | 656 - 1443 | 359 - 281 | 249 - 315 | 28 - 48 | | | | | | | | |
| 88/ 5/27 | 147 | 714 - 1435 | 181 - 7 | 142 - 284 | 28 - 48 | | | | | | | | |
| 88/ 5/28 | 148 | 635 - 1435 | 227 - 158 | 339 - 47 | 28 - 48 | | | | | | | | |
| 88/ 5/29 | 149 | 635 - 1435 | 18 - 388 | 183 - 258 | 28 - 48 | | | | | | | | |
| 88/ 5/30 | 150 | 635 - 11 8 | 168 - 328 | 26 - 63 | 28 - 48 | | | | | | | | |
| 88/ 6/ 1 | 152 | 635 - 1423 | 109 - 32 | 72 - 139 | 28 - 48 | | | | | | | | |
| 88/ 6/ 3 | 154 | 635 - 1414 | 68 - 327 | 123 - 184 | 28 - 48 | | | | | | | | |
| 88/ 6/ 4 | 155 | 614 - 1414 | 187 - 117 | 319 - 27 | 28 - 48 | | | | | | | | |
| 88/ 6/ 5 | 156 | 614 - 1414 | 337 - 268 | 163 - 238 | 28 - 48 | | | | | | | | |
| 88/ 6/ 6 | 157 | 614 - 14 5 | 128 - 52 | 6 - 72 | 28 - 48 | | | | | | | | |
| 88/ 6/ 7 | 158 | 715 - 14 2 | 315 - 281 | 218 - 275 | 28 - 48 | | | | | | | | |
| 88/ 6/ 8 | 159 | 559 - 1357 | 59 - 348 | 58 - 118 | 28 - 48 | | | | | | | | |
| 88/ 6/10 | 161 | 553 - 1453 | 356 - 323 | 96 - 172 | 28 - 48 | | | | | | | | |
| 88/ 6/11 | 162 | 557 - 1347 | 149 - 73 | 388 - 6 | 28 - 48 | | | | | | | | |
| 88/ 6/12 | 163 | 547 - 1347 | 294 - 224 | 142 - 289 | 28 - 48 | | | | | | | | |
| 88/ 6/13 | 164 | 547 - 1328 | 84 - 358 | 345 - 49 | 28 - 48 | | | | | | | | |
| 88/ 6/14 | 165 | 541 - 13 8 | 231 - 136 | 187 - 249 | 28 - 48 | | | | | | | | |
| 88/ 6/15 | 166 | 718 - 1212 | 88 - 257 | 44 - 06 | 28 - 48 | | | | | | | | |
| 88/ 6/16 | 167 | 534 - 1812 | 167 - 335 | 233 - 272 | 28 - 48 | | | | | | | | |
| 88/ 6/16 | 167 | 1212 - 1335 | 48 - 98 | 289 - 381 | 28 - 48 | | | | | | | | |
| 88/ 6/17 | 168 | 532 - 1335 | 316 - 248 | 76 - 144 | 28 - 48 | | | | | | | | |
| 88/ 6/18 | 169 | 529 - 1329 | 185 - 35 | 279 - 347 | 28 - 48 | | | | | | | | |
| 88/ 6/19 | 170 | 529 - 1329 | 255 - 185 | 122 - 198 | 28 - 48 | | | | | | | | |
| 88/ 6/20 | 171 | 529 - 942 | 45 - 198 | 325 - 1 | 28 - 48 | | | | | | | | |
| 88/ 6/21 | 172 | 528 - 838 | 198 - 385 | 167 - 194 | 28 - 48 | | | | | | | | |
| 88/ 6/22 | 173 | 516 - 838 | 338 - 96 | 18 - 37 | 28 - 48 | | | | | | | | |
| 88/ 6/23 | 174 | 629 - 1828 | 173 - 312 | 224 - 256 | 15 - 48 | | | | | | | | |
| 88/ 6/24 | 175 | 518 - 1318 | 275 - 206 | 56 - 124 | 28 - 48 | | | | | | | | |
| 88/ 6/25 | 176 | 5 7 - 13 7 | 64 - 354 | 259 - 326 | 28 - 48 | | | | | | | | |
| 88/ 6/26 | 177 | 9 7 - 13 7 | 359 - 145 | 136 - 178 | 28 - 48 | | | | | | | | |
| 88/ 6/27 | 178 | 9 7 - 1157 | 158 - 253 | 339 - 3 | 28 - 48 | | | | | | | | |
| 88/ 6/28 | 179 | 458 - 558 | 158 - 186 | 147 - 156 | 15 - 48 | | | | | | | | |
| 88/ 6/28 | 179 | 659 - 182 | 223 - 333 | 164 - 198 | 15 - 48 | | | | | | | | |
| 88/ 6/29 | 180 | 455 - 1819 | 298 - 134 | 358 - 36 | 28 - 48 | | | | | | | | |
| 88/ 6/30 | 181 | 8 8 - 1252 | 288 - 17 | 228 - 261 | 28 - 48 | | | | | | | | |
| 88/ 7/ 1 | 182 | 449 - 1249 | 235 - 166 | 36 - 194 | 28 - 48 | | | | | | | | |
| 88/ 7/ 2 | 183 | 449 - 1249 | 26 - 316 | 239 - 307 | 28 - 48 | | | | | | | | |
| 88/ 7/ 3 | 184 | 449 - 1249 | 176 - 186 | 82 - 158 | 28 - 48 | | | | | | | | |
| 88/ 7/ 4 | 185 | 449 - 748 | 327 - 76 | 286 - 311 | 28 - 48 | | | | | | | | |
| 88/ 7/ 5 | 186 | 436 - 7 8 | 189 - 281 | 127 - 149 | 28 - 48 | | | | | | | | |
| 88/ 7/ 6 | 187 | 433 - 633 | 258 - 338 | 338 - 347 | 15 - 48 | | | | | | | | |
| 88/ 7/ 7 | 188 | 438 - 1238 | 46 - 336 | 173 - 241 | 28 - 48 | | | | | | | | |
| 88/ 7/ 8 | 189 | 427 - 1227 | 195 - 125 | 16 - 84 | 28 - 48 | | | | | | | | |
| 88/ 7/ 9 | 190 | 424 - 1224 | 343 - 274 | 219 - 287 | 28 - 48 | | | | | | | | |
| 88/ 7/10 | 191 | 424 - 1224 | 134 - 64 | 62 - 138 | 28 - 48 | | | | | | | | |
| 88/ 7/11 | 192 | 643 - 7 1 | 8 - 19 | 285 - 288 | 28 - 48 | | | | | | | | |
| 88/ 7/13 | 194 | 411 - 1211 | 217 - 147 | 318 - 18 | 28 - 48 | | | | | | | | |
| 88/ 7/19 | 200 | 352 - 9 9 | 28 - 228 | 87 - 132 | 15 - 48 | | | | | | | | |
| 88/ 7/20 | 201 | 349 - 849 | 177 - 358 | 298 - 333 | 15 - 48 | | | | | | | | |
| 88/ 7/21 | 202 | 345 - 1213 | 325 - 272 | 133 - 285 | 15 - 48 | | | | | | | | |
| 88/ 7/22 | 203 | 342 - 1143 | 113 - 44 | 336 - 44 | 15 - 48 | | | | | | | | |
| 88/ 7/23 | 204 | 339 - 439 | 262 - 298 | 179 - 187 | 15 - 48 | | | | | | | | |
| 88/ 7/24 | 205 | 339 - 439 | 52 - 89 | 22 - 31 | 15 - 48 | | | | | | | | |
| 88/ 7/25 | 206 | 339 - 449 | 283 - 245 | 226 - 235 | 15 - 48 | | | | | | | | |
| 88/ 7/25 | 206 | 632 - 1133 | 387 - 129 | 258 - 293 | 15 - 48 | | | | | | | | |
| 88/ 7/27 | 208 | 329 - 729 | 138 - 283 | 271 - 305 | 15 - 48 | | | | | | | | |
| 88/ 7/28 | 209 | 324 - 1126 | 285 - 217 | 113 - 182 | 15 - 48 | | | | | | | | |
| 88/ 7/29 | 210 | 324 - 1122 | 76 - 6 | 317 - 24 | 15 - 48 | | | | | | | | |
| 88/ 7/30 | 211 | 316 - 1116 | 221 - 151 | 159 - 227 | 15 - 48 | | | | | | | | |
| 88/ 7/31 | 212 | 316 - 838 | 12 - 281 | 2 - 47 | 15 - 48 | | | | | | | | |
| 88/ 8/ 1 | 213 | 3 9 - 11 9 | 158 - 88 | 285 - 273 | 15 - 48 | | | | | | | | |
| 88/ 8/ 2 | 214 | 3 6 - 11 6 | 387 - 237 | 48 - 115 | 15 - 48 | | | | | | | | |
| 88/ 8/ 3 | 215 | 3 9 - 4 6 | 99 - 133 | 251 - 268 | 15 - 48 | | | | | | | | |
| 88/ 8/ 3 | 215 | 6 9 - 11 6 | 288 - 27 | 277 - 319 | 15 - 48 | | | | | | | | |
| 88/ 8/ 4 | 216 | 259 - 1859 | 243 - 173 | 93 - 161 | 15 - 48 | | | | | | | | |
| 88/ 8/ 5 | 217 | 256 - 1856 | 32 - 322 | 296 - 4 | 15 - 48 | | | | | | | | |
| 88/ 8/ 6 | 218 | 256 - 1856 | 182 - 112 | 148 - 287 | 15 - 48 | | | | | | | | |
| 88/ 8/ 7 | 219 | 256 - 1856 | 333 - 263 | 343 - 51 | 15 - 48 | | | | | | | | |
| 88/ 8/ 8 | 220 | 256 - 653 | 123 - 267 | 186 - 228 | 15 - 48 | | | | | | | | |
| 88/ 8/ 8 | 220 | 738 - 1856 | 289 - 53 | 225 - 254 | 15 - 48 | | | | | | | | |
| 88/ 8/ 9 | 221 | 243 - 1843 | 266 - 196 | 28 - 96 | 15 - 48 | | | | | | | | |
| 88/ 8/10 | 222 | 748 - 1823 | 236 - 334 | 273 - 296 | 15 - 48 | | | | | | | | |
| 88/ 8/11 | 223 | 236 - 1838 | 283 - 129 | 74 - 141 | 15 - 48 | | | | | | | | |
| 88/ 8/12 | 224 | 232 - 1832 | 351 - 201 | 277 - 344 | 15 - 48 | | | | | | | | |

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| DATE YY/MM/DD | DOY JJJ | TIME UT HHMM - HHMM | OBSERVATIONS CML III (1965.B) | | | | WIDTH MHZ | EMISSIONS CML III (1965.B) | | | | WIDTH MHZ |
|------------------|------------|------------------------|-------------------------------------|-----------|------------------------|----|--------------|----------------------------------|------------------------|-----------|-----------|--------------|
| | | | IO | PHASE | TIME UT HHMM - HHMM | IO | | PHASE | TIME UT HHMM - HHMM | IO | PHASE | |
| 88/ 8/13 | 225 | 229 - 1829 | 139 - 69 | 119 - 187 | 15 - 48 | | | | 411 - 429 | 142 - 153 | 181 - 183 | 22 - 26 |
| 88/ 8/14 | 226 | 229 - 1829 | 298 - 228 | 323 - 31 | 15 - 48 | | | | 629 - 728 | 225 - 261 | 288 - 288 | 28 - 38 |
| 88/ 8/15 | 227 | 219 - 1819 | 74 - 4 | 165 - 233 | 15 - 48 | | | | 533 - 548 | 342 - 346 | 36 - 37 | 15 - 21 |
| 88/ 8/16 | 228 | 214 - 1814 | 222 - 152 | 8 - 75 | 15 - 48 | | | | 838 - 98 | 94 - 187 | 62 - 65 | 18 - 28 |
| 88/ 8/18 | 230 | 216 - 1815 | 164 - 93 | 55 - 122 | 15 - 48 | | | | 251 - 252 | 185 - 186 | 68 - 68 | 15 - 19 |
| 88/ 8/19 | 231 | 212 - 1812 | 312 - 242 | 257 - 325 | 15 - 48 | | | | 311 - 541 | 197 - 288 | 62 - 84 | 18 - 38 |
| 88/ 8/20 | 232 | 2 5 - 180 5 | 98 - 28 | 180 - 168 | 28 - 48 | | | | 6 7 - 635 | 245 - 261 | 134 - 138 | 28 - 27 |
| 88/ 8/21 | 233 | 2 8 - 18 1 | 246 - 176 | 382 - 18 | 28 - 48 | | | | 2 8 - 219 | 246 - 257 | 382 - 385 | 28 - 25 |
| 88/ 8/22 | 234 | 2 1 - 18 1 | 37 - 327 | 146 - 214 | 28 - 48 | | | | 633 - 818 | 281 - 265 | 184 - 199 | 28 - 28 |
| 88/ 8/23 | 235 | 154 - 954 | 183 - 113 | 348 - 56 | 15 - 48 | | | | 259 - 548 | 222 - 328 | 358 - 28 | 18 - 38 |
| 88/ 8/24 | 236 | 151 - 951 | 332 - 262 | 191 - 259 | 15 - 48 | | | | | | | |
| 88/ 8/25 | 237 | 147 - 947 | 128 - 58 | 34 - 182 | 15 - 48 | | | | 455 - 618 | 234 - 284 | 61 - 73 | 18 - 27 |
| 88/ 8/26 | 238 | 144 - 258 | 269 - 389 | 237 - 247 | 15 - 48 | | | | 7 6 - 714 | 313 - 318 | 79 - 88 | 18 - 26 |
| 88/ 8/26 | 238 | 5 8 - 944 | 27 - 199 | 265 - 385 | 15 - 48 | | | | | | | |
| 88/ 8/27 | 239 | 141 - 941 | 57 - 347 | 88 - 148 | 15 - 48 | | | | 3 1 - 369 | 186 - 141 | 92 - 188 | 19 - 38 |
| 88/ 8/28 | 240 | 141 - 941 | 288 - 138 | 284 - 351 | 15 - 48 | | | | 332 - 425 | 275 - 387 | 299 - 387 | 18 - 22 |
| 88/ 8/29 | 241 | 141 - 241 | 358 - 35 | 127 - 136 | 28 - 48 | | | | | | | |
| 88/ 8/29 | 241 | 715 - 934 | 288 - 284 | 174 - 194 | 28 - 48 | | | | | | | |
| 88/ 8/30 | 242 | 138 - 238 | 142 - 179 | 329 - 337 | 15 - 48 | | | | | | | |
| 88/ 8/30 | 242 | 712 - 815 | 349 - 27 | 17 - 26 | 15 - 48 | | | | | | | |
| 88/ 8/31 | 243 | 138 - 238 | 293 - 329 | 172 - 181 | 15 - 48 | | | | | | | |
| 88/ 8/31 | 243 | 644 - 815 | 123 - 178 | 217 - 238 | 15 - 48 | | | | 856 - 938 | 282 - 223 | 235 - 248 | 28 - 33 |
| 88/ 9/ 1 | 244 | 122 - 222 | 78 - 115 | 15 - 23 | 15 - 48 | | | | 322 - 454 | 151 - 287 | 32 - 45 | 18 - 35 |
| 88/ 9/ 1 | 245 | 548 - 929 | 38 - 163 | 256 - 287 | 15 - 48 | | | | 551 - 614 | 241 - 255 | 53 - 56 | 18 - 23 |
| 88/ 9/ 3 | 246 | 115 - 915 | 15 - 385 | 61 - 128 | 15 - 48 | | | | | | | |
| 88/ 9/ 4 | 247 | 117 - 914 | 167 - 95 | 264 - 332 | 15 - 48 | | | | 2 7 - 588 | 197 - 332 | 271 - 383 | 16 - 36 |
| 88/ 9/ 5 | 248 | 1 9 - 918 | 313 - 244 | 187 - 175 | 15 - 48 | | | | | | | |
| 88/ 9/ 6 | 249 | 634 - 953 | 388 - 68 | 356 - 24 | 15 - 48 | | | | | | | |
| 88/ 9/ 7 | 250 | 638 - 811 | 88 - 149 | 199 - 213 | 15 - 48 | | | | | | | |
| 88/ 9/ 8 | 251 | 857 - 845 | 37 - 328 | 355 - 61 | 15 - 48 | | | | 655 - 7 8 | 254 - 261 | 46 - 48 | 28 - 25 |
| 88/ 9/ 9 | 252 | 853 - 863 | 185 - 116 | 198 - 266 | 16 - 48 | | | | 356 - 424 | 229 - 252 | 224 - 241 | 18 - 33 |
| 88/ 9/10 | 253 | 827 - 827 | 328 - 258 | 38 - 186 | 15 - 48 | | | | 519 - 631 | 137 - 188 | 55 - 72 | 18 - 28 |
| 88/ 9/11 | 254 | 823 - 823 | 188 - 38 | 241 - 389 | 15 - 48 | | | | 338 - 341 | 226 - 228 | 268 - 269 | 15 - 28 |
| 88/ 9/12 | 255 | 815 - 815 | 254 - 184 | 83 - 151 | 15 - 48 | | | | 359 - 4 2 | 239 - 241 | 271 - 272 | 15 - 19 |
| 88/ 9/13 | 256 | 838 - 838 | 58 - 349 | 298 - 358 | 15 - 48 | | | | 236 - 357 | 138 - 179 | 387 - 318 | 15 - 19 |
| 88/ 9/14 | 257 | 834 - 8 7 | 287 - 121 | 133 - 197 | 15 - 48 | | | | 429 - 722 | 198 - 383 | 322 - 347 | 18 - 26 |
| 88/ 9/17 | 260 | 823 - 823 | 292 - 222 | 22 - 89 | 28 - 48 | | | | 336 - 632 | 48 - 165 | 49 - 74 | 21 - 38 |
| 88/ 9/18 | 261 | 823 - 823 | 82 - 12 | 225 - 293 | 28 - 48 | | | | 847 - 159 | 97 - 148 | 228 - 239 | 21 - 27 |
| 88/ 9/19 | 262 | 823 - 823 | 233 - 163 | 69 - 136 | 28 - 48 | | | | 351 - 527 | 288 - 266 | 254 - 268 | 21 - 38 |
| 88/ 9/21 | 264 | 8 5 - 8 5 | 163 - 93 | 113 - 181 | 28 - 48 | | | | 845 - 114 | 246 - 264 | 72 - 76 | 21 - 27 |
| 88/ 9/22 | 265 | 8 8 - 8 8 | 311 - 241 | 316 - 24 | 28 - 48 | | | | 131 - 134 | 215 - 217 | 125 - 126 | 21 - 23 |
| 88/ 9/23 | 266 | 628 - 8 8 | 336 - 32 | 214 - 227 | 28 - 48 | | | | 246 - 4 1 | 261 - 386 | 136 - 146 | 21 - 31 |
| 88/ 9/23 | 266 | 2356 - 24 8 | 250 - 252 | 2 - 3 | 28 - 48 | | | | 419 - 436 | 187 - 118 | 352 - 355 | 21 - 26 |
| 88/ 9/24 | 267 | 8 8 - 756 | 252 - 188 | 3 - 78 | 28 - 48 | | | | 735 - 757 | 226 - 239 | 28 - 23 | 21 - 25 |
| 88/ 9/26 | 269 | 2344 - 24 8 | 334 - 344 | 251 - 253 | 28 - 48 | | | | | | | |
| 88/ 9/27 | 270 | 8 8 - 518 | 344 - 171 | 253 - 297 | 28 - 48 | | | | | | | |
| 88/ 9/27 | 270 | 2348 - 24 8 | 122 - 134 | 94 - 97 | 28 - 48 | | | | 2348 - 24 8 | 122 - 134 | 94 - 97 | 28 - 37 |
| 88/ 9/28 | 271 | 8 8 - 748 | 134 - 52 | 97 - 162 | 28 - 48 | | | | 8 8 - 833 | 134 - 154 | 97 - 181 | 28 - 37 |
| 88/ 9/28 | 271 | 2336 - 24 8 | 278 - 285 | 297 - 388 | 28 - 48 | | | | 251 - 3 3 | 238 - 245 | 121 - 123 | 28 - 24 |
| 88/ 9/28 | 271 | 2336 - 24 8 | 285 - 281 | 388 - 5 | 28 - 48 | | | | 331 - 433 | 262 - 299 | 127 - 135 | 28 - 26 |
| 88/ 9/29 | 272 | 2332 - 24 8 | 59 - 76 | 148 - 144 | 28 - 48 | | | | | | | |
| 88/ 9/29 | 272 | 2332 - 24 8 | 76 - 349 | 144 - 288 | 28 - 48 | | | | 423 - 525 | 235 - 272 | 181 - 198 | 22 - 26 |
| 88/ 9/30 | 273 | 8 8 - 732 | 76 - 349 | 144 - 288 | 28 - 48 | | | | | | | |
| 88/ 9/30 | 273 | 2328 - 24 8 | 287 - 226 | 343 - 347 | 28 - 48 | | | | | | | |
| 88/ 9/30 | 274 | 8 8 - 728 | 226 - 137 | 347 - 51 | 28 - 48 | | | | | | | |
| 88/ 9/30 | 274 | 2324 - 24 8 | 355 - 17 | 186 - 191 | 28 - 48 | | | | | | | |
| 88/ 9/30 | 275 | 8 8 - 724 | 17 - 285 | 191 - 254 | 28 - 48 | | | | | | | |
| 88/ 9/31 | 275 | 2322 - 24 8 | 144 - 167 | 29 - 34 | 28 - 48 | | | | 215 - 257 | 98 - 124 | 218 - 216 | 22 - 29 |
| 88/ 9/31 | 276 | 8 8 - 722 | 167 - 75 | 34 - 97 | 28 - 48 | | | | 451 - 639 | 193 - 258 | 232 - 247 | 22 - 37 |
| 88/ 9/31 | 276 | 2316 - 24 8 | 291 - 318 | 232 - 238 | 28 - 48 | | | | | | | |
| 88/ 9/31 | 277 | 8 8 - 716 | 318 - 222 | 238 - 388 | 28 - 48 | | | | | | | |
| 88/ 9/31 | 277 | 2314 - 24 8 | 16 - 58 | 121 - 129 | 28 - 48 | | | | | | | |
| 88/ 9/31 | 278 | 8 8 - 7 4 | 58 - 386 | 129 - 188 | 28 - 48 | | | | | | | |
| 88/ 9/31 | 278 | 2256 - 24 8 | 162 - 281 | 223 - 332 | 28 - 48 | | | | | | | |
| 88/ 9/31 | 281 | 8 8 - 658 | 281 - 93 | 332 - 31 | 28 - 48 | | | | | | | |
| 88/ 9/31 | 281 | 2255 - 24 8 | 312 - 351 | 166 - 176 | 28 - 48 | | | | | | | |
| 88/ 9/31 | 282 | 8 8 - 655 | 351 - 242 | 176 - 234 | 28 - 48 | | | | | | | |
| 88/ 9/31 | 282 | 2255 - 24 8 | 183 - 142 | 18 - 19 | 28 - 48 | | | | | | | |
| 88/ 9/31 | 283 | 8 8 - 655 | 142 - 33 | 19 - 78 | 28 - 48 | | | | | | | |
| 88/ 9/31 | 283 | 2314 - 24 8 | 265 - 293 | 216 - 223 | 28 - 48 | | | | | | | |
| 88/ 9/31 | 284 | 8 8 - 647 | 293 - 179 | 223 - 288 | 28 - 48 | | | | | | | |
| 88/ 9/31 | 284 | 2243 - 24 8 | 37 - 83 | 55 - 66 | 28 - 48 | | | | | | | |
| 88/ 9/31 | 285 | 8 8 - 643 | 83 - 327 | 66 - 123 | 28 - 48 | | | | | | | |
| 88/ 9/31 | 285 | 2243 - 24 8 | 37 - 83 | 55 - 66 | 28 - 48 | | | | 2331 - 2359 | 275 - 292 | 219 - 223 | 22 - 23 |
| 88/ 9/31 | 285 | 8 8 - 643 | 83 - 327 | 66 - 123 | 28 - 48 | | | | 826 - 126 | 388 - 345 | 226 - 235 | 28 - 31 |
| 88/ 9/31 | 286 | 2239 - 24 8 | 185 - 234 | 258 - 278 | 28 - 48 | | | | 416 - 527 | 235 - 281 | 182 - 113 | 28 - 25 |
| 88/ 9/31 | 286 | 8 8 - 639 | 234 - 115 | 278 - 326 | 28 - 48 | | | | 156 - 241 | 3 - 8 | 239 - 248 | 28 - 22 |
| 88/ 9/31 | 286 | 2239 - 24 8 | 185 - 234 | 258 - 278 | 28 - 48 | | | | 311 - 212 | 277 - 314 | 268 - 278 | 28 - 26 |
| 88/ 9/31 | 287 | 2335 - 24 8 | 332 - 25 | 181 - 113 | 28 - 48 | | | | | | | |
| 88/ 9/31 | 287 | 8 8 - 635 | 25 - 263 | 113 - 169 | 28 - 48 | | | | 134 - 238 | 81 - 128 | 127 - 136 | 22 - 31 |
| 88/ 9/31 | 287 | 2338 - 24 8 | 121 - 157 | 394 - 313 | 28 - 48 | | | | | | | |
| 88/ 9/31 | 288 | 2338 - 24 8 | 271 - 326 | 148 - 161 | 28 - 48 | | | | | | | |
| 88/ 9/31 | 288 | 8 8 - 638 | 326 - 282 | 161 - 216 | 28 - 48 | | | | | | | |
| 88/ 9/31 | 289 | 2238 - 24 8 | 52 - 116 | 351 - 4 | 28 - 48 | | | | 356 - 448 | 188 - 148 | 194 - 281 | 22 - 38 |
| 88/ 9/31 | 289 | 8 8 - 638 | 116 - 352 | 4 - 59 | 28 - 48 | | | | 828 - 847 | 133 - 145 | 8 - 11 | 28 - 34 |
| 88/ 9/31 | 289 | 2217 - 2317 | 285 - 241 | 193 - 282 | 28 - 48 | | | | 249 - 519 | 219 - 389 | 28 - 49 | 22 - 29 |
| 88/ 9/31 | 290 | 2213 - 2313 | 353 - 58 | | | | | | | | | |

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| DATE YY/MM/DD | DOY JJJ | TIME UT HHMM - HHMM | OBSERVATIONS CML III (1965.8) | | | WIDTH MHZ | TIME UT HHMM - HHMM | EMISSIONS CML III (1965.8) | | | WIDTH MHZ |
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| 88/18/21 | 294 | 00 0 - 6 5 | 359 - 228 | 98 - 158 | 28 - 48 | | | 148 - 321 | 218 - 271 | 316 - 338 | 28 - 28 |
| 88/18/21 | 294 | 22 1 - 24 0 | 78 - 158 | 285 - 382 | 28 - 48 | | | 337 - 351 | 281 - 289 | 333 - 335 | 28 - 23 |
| 88/18/22 | 295 | 00 0 - 6 1 | 158 - 8 | 382 - 353 | 28 - 48 | | | 423 - 5 2 | 389 - 332 | 339 - 345 | 28 - 24 |
| 88/18/22 | 295 | 2157 - 24 0 | 226 - 388 | 128 - 146 | 28 - 48 | | | 2251 - 24 0 | 259 - 388 | 136 - 146 | 28 - 24 |
| 88/18/23 | 296 | 00 0 - 557 | 388 - 156 | 146 - 196 | 28 - 48 | | | 0 8 - 5 5 | 388 - 383 | 146 - 146 | 28 - 24 |
| 88/18/23 | 296 | 2153 - 24 0 | 14 - 91 | 331 - 349 | 28 - 48 | | | | | | |
| 88/18/24 | 297 | 00 0 - 553 | 91 - 385 | 349 - 39 | 28 - 48 | | | | | | |
| 88/18/24 | 297 | 2148 - 24 0 | 162 - 242 | 174 - 193 | 28 - 48 | | | 2355 - 2359 | 239 - 241 | 192 - 193 | 28 - 26 |
| 88/18/25 | 298 | 00 0 - 548 | 242 - 92 | 193 - 242 | 28 - 48 | | | | | | |
| 88/18/25 | 298 | 2143 - 24 0 | 318 - 32 | 17 - 36 | 28 - 48 | | | | | | |
| 88/18/26 | 299 | 00 0 - 543 | 32 - 248 | 36 - 85 | 28 - 48 | | | 836 - 148 | 54 - 98 | 41 - 52 | 28 - 26 |
| 88/18/26 | 299 | 2148 - 24 0 | 98 - 183 | 228 - 248 | 25 - 48 | | | 258 - 346 | 148 - 169 | 62 - 68 | 28 - 26 |
| 88/18/27 | 300 | 00 0 - 539 | 183 - 28 | 248 - 288 | 25 - 48 | | | 849 - 148 | 213 - 248 | 247 - 255 | 28 - 35 |
| 88/18/27 | 300 | 2134 - 24 0 | 246 - 334 | 63 - 84 | 28 - 48 | | | 22 4 - 2219 | 264 - 273 | 67 - 69 | 28 - 24 |
| 88/18/28 | 301 | 00 0 - 534 | 334 - 176 | 84 - 131 | 28 - 48 | | | 2358 - 24 0 | 328 - 334 | 82 - 84 | 28 - 22 |
| 88/18/28 | 301 | 2138 - 24 0 | 34 - 124 | 266 - 287 | 28 - 48 | | | 0 0 - 458 | 334 - 154 | 84 - 126 | 28 - 22 |
| 88/18/29 | 302 | 00 0 - 538 | 124 - 324 | 287 - 334 | 28 - 48 | | | | | | |
| 88/18/29 | 302 | 2139 - 2338 | 184 - 257 | 118 - 127 | 28 - 48 | | | 251 - 431 | 228 - 288 | 311 - 325 | 28 - 26 |
| 88/18/30 | 303 | 2139 - 24 0 | 335 - 66 | 313 - 334 | 2 - 4 | | | 2139 - 22 8 | 198 - 287 | 111 - 115 | 28 - 23 |
| 88/18/31 | 304 | 00 0 - 54 | 66 - 68 | 334 - 325 | 2 - 4 | | | | | | |
| 88/18/31 | 304 | 2139 - 24 0 | 126 - 217 | 157 - 178 | 28 - 48 | | | | | | |
| 88/11/ 1 | 385 | 00 0 - 538 | 217 - 56 | 179 - 225 | 28 - 48 | | | | | | |
| 88/11/ 1 | 385 | 2148 - 24 0 | 283 - 7 | 2 - 22 | 28 - 48 | | | | | | |
| 88/11/ 2 | 386 | 00 0 - 538 | 7 - 287 | 22 - 68 | 28 - 48 | | | 128 - 234 | 68 - 188 | 34 - 43 | 28 - 32 |
| 88/11/ 2 | 386 | 2238 - 24 0 | 103 - 158 | 212 - 225 | 28 - 48 | | | 312 - 314 | 123 - 124 | 49 - 49 | 28 - 29 |
| 88/11/ 3 | 387 | 00 0 - 515 | 158 - 348 | 225 - 278 | 28 - 48 | | | 354 - 355 | 149 - 149 | 55 - 55 | 28 - 24 |
| 88/11/ 3 | 387 | 21 4 - 24 0 | 282 - 389 | 44 - 69 | 28 - 48 | | | | | | |
| 88/11/ 4 | 388 | 00 0 - 54 | 389 - 132 | 69 - 112 | 28 - 48 | | | 2133 - 2256 | 228 - 278 | 48 - 68 | 28 - 36 |
| 88/11/ 5 | 389 | 21 0 - 24 0 | 141 - 258 | 91 - 116 | 28 - 48 | | | 2316 - 24 0 | 252 - 389 | 63 - 63 | 28 - 28 |
| 88/11/ 6 | 310 | 00 0 - 458 | 258 - 65 | 116 - 157 | 28 - 48 | | | 2858 - 24 0 | 135 - 258 | 89 - 116 | 28 - 35 |
| 88/11/ 6 | 310 | 2951 - 24 0 | 286 - 41 | 293 - 328 | 28 - 48 | | | 24 1 - 2242 | 317 - 353 | 388 - 389 | 28 - 23 |
| 88/11/ 7 | 311 | 00 0 - 451 | 41 - 217 | 328 - 1 | 28 - 48 | | | 138 - 228 | 95 - 125 | 332 - 339 | 28 - 29 |
| 88/11/ 7 | 311 | 2947 - 23 0 | 75 - 155 | 136 - 155 | 28 - 48 | | | 258 - 252 | 143 - 145 | 344 - 344 | 28 - 24 |
| 88/11/ 8 | 312 | 2942 - 24 0 | 222 - 342 | 339 - 7 | 28 - 48 | | | | | | |
| 88/11/ 9 | 313 | 00 0 - 442 | 342 - 152 | 7 - 47 | 28 - 48 | | | 2121 - 2222 | 246 - 283 | 344 - 353 | 28 - 25 |
| 88/11/ 9 | 313 | 2937 - 24 0 | 10 - 133 | 182 - 211 | 28 - 48 | | | 2258 - 2254 | 388 - 382 | 357 - 358 | 28 - 23 |
| 88/11/10 | 314 | 00 0 - 437 | 133 - 388 | 211 - 258 | 28 - 48 | | | 3 9 - 336 | 96 - 113 | 34 - 37 | 28 - 27 |
| 88/11/10 | 314 | 2933 - 24 0 | 158 - 283 | 25 - 54 | 28 - 48 | | | | | | |
| 88/11/11 | 315 | 00 0 - 433 | 283 - 88 | 54 - 93 | 28 - 48 | | | 2214 - 2313 | 219 - 255 | 39 - 47 | 28 - 26 |
| 88/11/11 | 315 | 2928 - 24 0 | 386 - 74 | 228 - 258 | 28 - 48 | | | 2829 - 2217 | 386 - 12 | 228 - 243 | 28 - 38 |
| 88/11/12 | 316 | 00 0 - 428 | 74 - 236 | 258 - 296 | 28 - 48 | | | 838 - 135 | 92 - 131 | 262 - 271 | 28 - 26 |
| 88/11/12 | 316 | 2924 - 24 0 | 94 - 225 | 71 - 101 | 28 - 48 | | | 2828 - 2313 | 97 - 196 | 71 - 95 | 28 - 33 |
| 88/11/13 | 317 | 00 0 - 428 | 225 - 27 | 181 - 139 | 28 - 48 | | | 2358 - 2351 | 219 - 219 | 188 - 188 | 28 - 25 |
| 88/11/13 | 317 | 2924 - 24 0 | 245 - 15 | 274 - 305 | 28 - 48 | | | 2819 - 2133 | 245 - 337 | 186 - 128 | 28 - 32 |
| 88/11/14 | 318 | 00 0 - 428 | 15 - 177 | 305 - 343 | 28 - 48 | | | 22 5 - 2242 | 386 - 328 | 289 - 294 | 28 - 25 |
| 88/11/14 | 318 | 2915 - 24 0 | 38 - 166 | 117 - 149 | 28 - 48 | | | 3 9 - 318 | 138 - 135 | 332 - 333 | 28 - 25 |
| 88/11/15 | 319 | 00 0 - 415 | 166 - 328 | 149 - 185 | 28 - 48 | | | 2228 - 2233 | 106 - 113 | 134 - 136 | 28 - 25 |
| 88/11/15 | 319 | 2918 - 24 0 | 178 - 317 | 328 - 352 | 28 - 48 | | | 1 2 - 327 | 284 - 291 | 157 - 178 | 28 - 28 |
| 88/11/16 | 320 | 00 0 - 411 | 317 - 108 | 352 - 28 | 28 - 48 | | | 336 - 353 | 297 - 387 | 179 - 182 | 28 - 22 |
| 88/11/16 | 320 | 2918 - 24 0 | 317 - 108 | 352 - 28 | 28 - 48 | | | 2149 - 24 0 | 238 - 317 | 334 - 352 | 28 - 28 |
| 88/11/16 | 320 | 00 0 - 411 | 317 - 108 | 352 - 28 | 28 - 48 | | | 3 7 - 311 | 78 - 72 | 19 - 19 | 28 - 24 |
| 88/11/16 | 320 | 29 6 - 24 0 | 326 - 187 | 163 - 196 | 28 - 48 | | | 355 - 4 0 | 99 - 182 | 25 - 26 | 28 - 28 |
| 88/11/17 | 321 | 00 0 - 4 6 | 187 - 256 | 196 - 231 | 28 - 48 | | | | | | |
| 88/11/17 | 321 | 20 1 - 24 0 | 114 - 258 | 6 - 39 | 28 - 48 | | | | | | |
| 88/11/18 | 322 | 00 0 - 4 2 | 258 - 44 | 39 - 74 | 28 - 48 | | | 2245 - 24 0 | 213 - 258 | 29 - 39 | 28 - 24 |
| 88/11/18 | 322 | 1952 - 24 0 | 259 - 49 | 288 - 243 | 28 - 48 | | | 0 0 - 121 | 258 - 387 | 39 - 51 | 28 - 24 |
| 88/11/19 | 323 | 00 0 - 352 | 49 - 189 | 243 - 276 | 28 - 48 | | | 2151 - 2357 | 331 - 47 | 225 - 243 | 28 - 21 |
| 88/11/19 | 323 | 2853 - 24 0 | 66 - 199 | 68 - 87 | 28 - 48 | | | | | | |
| 88/11/20 | 324 | 00 0 - 358 | 199 - 339 | 87 - 119 | 28 - 48 | | | 2855 - 2131 | 88 - 189 | 61 - 66 | 28 - 26 |
| 88/11/20 | 324 | 2855 - 24 0 | 238 - 358 | 264 - 298 | 28 - 48 | | | 2224 - 2345 | 141 - 198 | 73 - 85 | 28 - 27 |
| 88/11/21 | 325 | 00 0 - 358 | 358 - 129 | 298 - 323 | 28 - 48 | | | 218 - 226 | 283 - 288 | 186 - 187 | 28 - 22 |
| 88/11/21 | 325 | 1940 - 24 0 | 344 - 141 | 97 - 134 | 28 - 48 | | | 2857 - 2222 | 239 - 291 | 264 - 277 | 28 - 23 |
| 88/11/22 | 326 | 00 0 - 348 | 141 - 274 | 134 - 165 | 28 - 48 | | | | | | |
| 88/11/22 | 326 | 1939 - 24 0 | 134 - 291 | 381 - 338 | 28 - 48 | | | | | | |
| 88/11/23 | 327 | 00 0 - 339 | 291 - 64 | 338 - 9 | 28 - 48 | | | | | | |
| 88/11/23 | 327 | 1934 - 24 0 | 281 - 82 | 144 - 181 | 28 - 48 | | | | | | |
| 88/11/24 | 328 | 00 0 - 334 | 82 - 212 | 181 - 212 | 28 - 48 | | | 2018 - 2841 | 383 - 322 | 149 - 153 | 28 - 25 |
| 88/11/25 | 329 | 1926 - 24 0 | 218 - 23 | 198 - 229 | 28 - 48 | | | 1926 - 2146 | 218 - 382 | 198 - 218 | 28 - 38 |
| 88/11/25 | 329 | 00 0 - 326 | 23 - 148 | 229 - 258 | 28 - 48 | | | 22 4 - 2219 | 313 - 322 | 212 - 214 | 28 - 29 |
| 88/11/25 | 329 | 1921 - 24 0 | 5 - 174 | 33 - 72 | 28 - 48 | | | 2818 - 2212 | 48 - 189 | 41 - 57 | 28 - 38 |
| 88/11/26 | 331 | 00 0 - 321 | 174 - 295 | 72 - 101 | 28 - 48 | | | 1 6 - 117 | 214 - 221 | 81 - 83 | 28 - 22 |
| 88/11/26 | 332 | 1912 - 2812 | 381 - 338 | 79 - 87 | 28 - 48 | | | | | | |
| 88/11/27 | 333 | 19 8 - 24 0 | 98 - 266 | 282 - 323 | 15 - 48 | | | 23 6 - 24 0 | 233 - 266 | 315 - 323 | 15 - 27 |
| 88/11/27 | 334 | 19 8 - 3 0 | 266 - 28 | 323 - 358 | 15 - 48 | | | 0 0 - 2 3 | 266 - 348 | 323 - 348 | 15 - 27 |
| 88/11/27 | 334 | 19 3 - 24 0 | 237 - 57 | 125 - 167 | 15 - 48 | | | 1922 - 1929 | 249 - 253 | 127 - 128 | 15 - 25 |
| 88/12/ 1 | 335 | 00 0 - 3 3 | 57 - 167 | 167 - 192 | 15 - 48 | | | | | | |
| 88/12/ 1 | 335 | 1959 - 24 0 | 25 - 287 | 328 - 18 | 15 - 48 | | | | | | |
| 88/12/ 2 | 336 | 00 0 - 259 | 287 - 316 | 10 - 36 | 15 - 48 | | | 818 - 221 | 213 - 293 | 12 - 38 | 15 - 25 |
| 88/12/ 2 | 336 | 1954 - 24 0 | 173 - 358 | 171 - 214 | 15 - 48 | | | | | | |
| 88/12/ 3 | 337 | 00 0 - 254 | 358 - 103 | 214 - 238 | 15 - 48 | | | | | | |
| 88/12/ 3 | 337 | 1849 - 24 0 | 321 - 149 | 13 - 57 | 15 - 48 | | | | | | |
| 88/12/ 4 | 338 | 00 0 - 248 | 149 - 258 | 57 - 81 | 15 - 48 | | | | | | |
| 88/12/ 4 | 338 | 1846 - 24 0 | 118 - 299 | 217 - 261 | 15 - 48 | | | 2849 - 24 0 | 184 - 299 | 234 - 261 | 15 - 38 |
| 88/12/ 5 | 339 | 00 0 - 246 | 299 - 48 | 261 - 285 | 15 - 48 | | | 0 0 - 558 | 299 - 334 | 261 - 269 | 15 - 38 |
| 88/12/ 5 | 339 | 1842 - 24 0 | 258 - 98 | 68 - 105 | 15 - 48 | | | | | | |
| 88/12/ 6 | 340 | 00 0 - 242 | 98 - 188 | 185 - 128 | 15 - 48 | | | | | | |

Catalogue. continued

| DATE YY/MM/DD | DOY JJJ | TIME UT HHMM - HHMM | OBSERVATIONS | | | | WIDTH MHZ | TIME UT HHMM - HHMM | EMISSIONS | | | | WIDTH MHZ |
|------------------|------------|------------------------|---------------------|-----------|---------|---------------------|--------------|------------------------|--------------|-----------|-----------|---------|--------------|
| | | | CML III (1965.8) | IO | PHASE | CML III (1965.8) | | | IO | PHASE | | | |
| 88/12/18 | 344 | 00 00 - 223 | 333 - 59 | 199 - 219 | 15 - 48 | | | 2148 - 2351 | 248 - 327 | 179 - 198 | 15 - 25 | | |
| 88/12/18 | 344 | 1823 - 24 00 | 279 - 123 | 355 - 43 | 15 - 48 | | | | | | | | |
| 88/12/11 | 345 | 00 00 - 223 | 123 - 210 | 43 - 63 | 15 - 48 | | | 2138 - 24 00 | 188 - 274 | 226 - 246 | 17 - 36 | | |
| 88/12/11 | 345 | 1814 - 24 00 | 65 - 274 | 197 - 246 | 15 - 48 | | | | 00 00 - 0226 | 274 - 298 | 246 - 258 | 17 - 36 | |
| 88/12/12 | 346 | 00 00 - 214 | 274 - 355 | 246 - 265 | 15 - 48 | | | 117 - 127 | 328 - 326 | 257 - 259 | 17 - 22 | | |
| 88/12/12 | 346 | 1818 - 24 00 | 213 - 64 | 48 - 98 | 15 - 48 | | | 1927 - 2818 | 259 - 285 | 51 - 57 | 15 - 26 | | |
| 88/12/13 | 347 | 00 00 - 218 | 64 - 143 | 98 - 188 | 15 - 48 | | | 2358 - 24 00 | 58 - 64 | 89 - 98 | 15 - 36 | | |
| 88/12/14 | 348 | 18 1 - 24 00 | 149 - 6 | 86 - 137 | 15 - 48 | | | 18 1 - 2228 | 149 - 305 | 86 - 123 | 15 - 35 | | |
| 88/12/15 | 349 | 00 00 - 2 00 | 6 - 78 | 137 - 154 | 15 - 48 | | | 2252 - 2259 | 325 - 329 | 128 - 129 | 15 - 17 | | |
| 88/12/15 | 349 | 1756 - 24 00 | 296 - 156 | 289 - 341 | 15 - 48 | | | | | | | | |
| 88/12/16 | 350 | 00 00 - 156 | 156 - 226 | 341 - 357 | 15 - 48 | | | 1748 - 19 6 | 291 - 339 | 288 - 299 | 16 - 27 | | |
| 88/12/16 | 350 | 1752 - 24 00 | 84 - 387 | 132 - 184 | 15 - 48 | | | 2141 - 24 00 | 72 - 156 | 321 - 341 | 16 - 38 | | |
| 88/12/17 | 351 | 00 00 - 152 | 387 - 15 | 184 - 288 | 15 - 48 | | | 2115 - 24 00 | 287 - 387 | 161 - 184 | 18 - 27 | | |
| 88/12/17 | 351 | 1747 - 24 00 | 232 - 98 | 335 - 28 | 15 - 48 | | | 00 00 - 128 | 387 - 355 | 184 - 196 | 18 - 27 | | |
| 88/12/17 | 351 | 1747 - 24 00 | 198 - 387 | 335 - 28 | 15 - 48 | | | 149 - 152 | 13 - 15 | 288 - 288 | 18 - 19 | | |
| 88/12/18 | 352 | 00 00 - 152 | 98 - 165 | 28 - 44 | 15 - 48 | | | 18 0 - 1836 | 248 - 262 | 337 - 342 | 16 - 26 | | |
| 88/12/18 | 352 | 1743 - 24 00 | 28 - 248 | 178 - 231 | 15 - 48 | | | 19 8 - 2834 | 281 - 333 | 347 - 359 | 16 - 29 | | |
| 88/12/19 | 353 | 00 00 - 144 | 248 - 311 | 231 - 246 | 15 - 48 | | | | | | | | |
| 88/12/19 | 353 | 1739 - 24 00 | 168 - 39 | 21 - 75 | 15 - 48 | | | 2157 - 2223 | 324 - 348 | 58 - 61 | 17 - 22 | | |
| 88/12/28 | 354 | 00 00 - 139 | 39 - 99 | 75 - 89 | 15 - 48 | | | 23 4 - 2342 | 5 - 28 | 67 - 73 | 17 - 21 | | |
| 88/12/28 | 354 | 1735 - 24 00 | 317 - 189 | 224 - 279 | 15 - 48 | | | 00 00 - 139 | 57 - 99 | 79 - 89 | 15 - 39 | | |
| 88/12/21 | 355 | 00 00 - 135 | 189 - 247 | 279 - 292 | 15 - 48 | | | | | | | | |
| 88/12/21 | 355 | 1738 - 24 00 | 184 - 348 | 67 - 122 | 15 - 48 | | | 1835 - 1938 | 143 - 177 | 76 - 84 | 17 - 27 | | |
| 88/12/22 | 356 | 00 00 - 138 | 348 - 34 | 122 - 135 | 15 - 48 | | | 2233 - 2253 | 287 - 299 | 118 - 113 | 15 - 21 | | |
| 88/12/22 | 356 | 1726 - 24 00 | 252 - 131 | 278 - 326 | 15 - 48 | | | | | | | | |
| 88/12/23 | 357 | 00 00 - 126 | 131 - 182 | 326 - 338 | 15 - 48 | | | | | | | | |
| 88/12/23 | 357 | 1722 - 24 00 | 48 - 281 | 113 - 169 | 15 - 48 | | | 2318 - 2351 | 251 - 276 | 162 - 168 | 16 - 28 | | |
| 88/12/24 | 358 | 00 00 - 122 | 281 - 331 | 169 - 181 | 15 - 48 | | | 00 15 - 115 | 298 - 326 | 171 - 188 | 16 - 23 | | |
| 88/12/24 | 358 | 1717 - 24 00 | 188 - 72 | 316 - 13 | 15 - 48 | | | | | | | | |
| 88/12/25 | 359 | 00 00 - 117 | 72 - 118 | 13 - 24 | 15 - 48 | | | | | | | | |
| 88/12/25 | 359 | 1714 - 24 00 | 337 - 222 | 159 - 217 | 15 - 48 | | | 2321 - 24 00 | 199 - 222 | 211 - 217 | 16 - 31 | | |
| 88/12/26 | 360 | 00 00 - 113 | 222 - 266 | 217 - 227 | 15 - 48 | | | 00 00 - 113 | 222 - 266 | 217 - 227 | 16 - 31 | | |
| 88/12/26 | 360 | 17 9 - 24 00 | 124 - 13 | 2 - 68 | 15 - 48 | | | 1935 - 2143 | 213 - 298 | 23 - 41 | 15 - 29 | | |
| 88/12/27 | 361 | 00 00 - 1 9 | 13 - 55 | 68 - 78 | 15 - 48 | | | 00 44 - 046 | 39 - 52 | 66 - 67 | 15 - 28 | | |
| 88/12/27 | 361 | 17 4 - 24 00 | 272 - 163 | 285 - 264 | 15 - 48 | | | 1816 - 1847 | 315 - 334 | 215 - 219 | 18 - 22 | | |
| 88/12/28 | 362 | 00 00 - 1 4 | 163 - 282 | 264 - 273 | 15 - 48 | | | 23 1 - 2358 | 128 - 162 | 255 - 263 | 18 - 23 | | |
| 88/12/28 | 362 | 17 0 - 24 00 | 68 - 314 | 48 - 187 | 15 - 48 | | | 1915 - 20 4 | 142 - 171 | 67 - 74 | 16 - 23 | | |
| 88/12/29 | 363 | 00 00 - 1 0 | 314 - 358 | 187 - 116 | 15 - 48 | | | 2112 - 24 00 | 212 - 314 | 83 - 107 | 16 - 26 | | |
| 88/12/29 | 363 | 17 0 - 24 00 | 314 - 358 | 187 - 116 | 15 - 48 | | | 00 00 - 118 | 314 - 356 | 187 - 117 | 16 - 26 | | |

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| DATE YY/MM/DD | DOY JJJ | TIME UT HHMM - HHMM | OBSERVATIONS | | | | WIDTH MHZ | TIME UT HHMM - HHMM | EMISSIONS | | | | WIDTH MHZ |
|------------------|------------|------------------------|---------------------|-----------|-----------|---------------------|--------------|------------------------|-----------|---------|--|--|--------------|
| | | | CML III (1965.8) | IO | PHASE | CML III (1965.8) | | | IO | PHASE | | | |
| 89/ 1/ 3 | 3 | 1635 - 24 8 | 228 - 137 | 186 - 248 | 15 - 48 | 1643 - 2317 | 233 - 111 | 187 - 242 | 15 - 28 | | | | |
| 89/ 1/ 4 | 4 | 8 8 - 835 | 137 - 158 | 248 - 253 | 15 - 48 | | | | | | | | |
| 89/ 1/ 4 | 4 | 1631 - 24 8 | 16 - 288 | 29 - 92 | 15 - 48 | 1747 - 24 8 | 62 - 288 | 39 - 92 | 16 - 26 | | | | |
| 89/ 1/ 5 | 5 | 8 8 - 831 | 288 - 387 | 92 - 96 | 15 - 48 | 8 8 - 818 | 288 - 294 | 92 - 93 | 16 - 26 | | | | |
| 89/ 1/ 5 | 5 | 1627 - 24 8 | 164 - 78 | 231 - 296 | 15 - 48 | 1658 - 21 6 | 183 - 333 | 236 - 271 | 18 - 35 | | | | |
| 89/ 1/ 6 | 6 | 8 8 - 827 | 78 - 95 | 296 - 299 | 15 - 48 | | | | | | | | |
| 89/ 1/ 6 | 6 | 1623 - 24 8 | 313 - 229 | 74 - 139 | 15 - 48 | 1954 - 24 8 | 88 - 229 | 184 - 139 | 15 - 24 | | | | |
| 89/ 1/ 7 | 7 | 8 8 - 823 | 229 - 243 | 139 - 142 | 15 - 48 | 8 8 - 824 | 229 - 243 | 139 - 142 | 15 - 24 | | | | |
| 89/ 1/ 7 | 7 | 1623 - 24 8 | 183 - 19 | 278 - 343 | 15 - 48 | 1958 - 2355 | 228 - 16 | 387 - 342 | 18 - 26 | | | | |
| 89/ 1/ 8 | 8 | 8 8 - 823 | 19 - 33 | 343 - 346 | 15 - 48 | | | | | | | | |
| 89/ 1/ 8 | 8 | 1623 - 24 8 | 254 - 178 | 121 - 186 | 28 - 48 | | | | | | | | |
| 89/ 1/ 9 | 9 | 8 8 - 823 | 178 - 184 | 186 - 189 | 28 - 48 | | | | | | | | |
| 89/ 1/ 9 | 9 | 1619 - 24 8 | 36 - 328 | 323 - 38 | 15 - 48 | 2158 - 24 8 | 242 - 328 | 11 - 38 | 17 - 23 | | | | |
| 89/ 1/10 | 10 | 8 8 - 818 | 328 - 326 | 38 - 31 | 15 - 48 | 8 8 - 818 | 328 - 326 | 38 - 31 | 17 - 23 | | | | |
| 89/ 1/10 | 10 | 1616 - 24 8 | 184 - 111 | 166 - 233 | 15 - 48 | 1814 - 1826 | 262 - 269 | 184 - 186 | 19 - 24 | | | | |
| 89/ 1/11 | 11 | 8 8 - 816 | 111 - 114 | 233 - 234 | 15 - 48 | | | | | | | | |
| 89/ 1/11 | 11 | 16 3 - 24 8 | 333 - 261 | 9 - 77 | 15 - 48 | 2246 - 24 8 | 217 - 261 | 66 - 77 | 16 - 23 | | | | |
| 89/ 1/12 | 12 | 8 8 - 8 3 | 261 - 263 | 77 - 77 | 15 - 48 | 8 8 - 8 3 | 261 - 263 | 77 - 77 | 16 - 23 | | | | |
| 89/ 1/12 | 12 | 1559 - 2359 | 121 - 51 | 212 - 288 | 15 - 48 | 1838 - 2848 | 212 - 296 | 233 - 253 | 18 - 34 | | | | |
| 89/ 1/13 | 13 | 1554 - 2354 | 269 - 199 | 55 - 123 | 15 - 48 | 2257 - 2357 | 14 - 58 | 271 - 288 | 16 - 24 | | | | |
| 89/ 1/13 | 13 | 2315 - 2354 | 321 - 235 | 175 - 197 | 175 - 197 | 2315 - 2351 | 175 - 197 | 117 - 122 | 18 - 22 | | | | |
| 89/ 1/14 | 14 | 1551 - 2358 | 57 - 347 | 258 - 326 | 15 - 48 | 1632 - 2254 | 82 - 313 | 264 - 318 | 16 - 23 | | | | |
| 89/ 1/15 | 15 | 1551 - 2358 | 288 - 137 | 181 - 159 | 28 - 48 | | | | | | | | |
| 89/ 1/16 | 16 | 1542 - 24 8 | 353 - 294 | 384 - 14 | 28 - 48 | 1943 - 2153 | 138 - 217 | 338 - 356 | 18 - 27 | | | | |
| 89/ 1/17 | 17 | 8 8 - 842 | 294 - 319 | 14 - 28 | 28 - 48 | | | | | | | | |
| 89/ 1/17 | 17 | 1539 - 24 8 | 141 - 94 | 147 - 218 | 28 - 48 | 1728 - 28 2 | 283 - 388 | 161 - 184 | 18 - 25 | | | | |
| 89/ 1/18 | 18 | 8 8 - 838 | 84 - 187 | 218 - 223 | 28 - 48 | | | | | | | | |
| 89/ 1/18 | 18 | 1534 - 24 8 | 289 - 235 | 358 - 61 | 28 - 48 | 2127 - 2225 | 142 - 177 | 39 - 48 | 16 - 28 | | | | |
| 89/ 1/19 | 19 | 8 8 - 834 | 235 - 255 | 61 - 66 | 28 - 48 | 2313 - 24 8 | 286 - 235 | 54 - 61 | 17 - 27 | | | | |
| 89/ 1/19 | 19 | 1538 - 24 8 | 77 - 25 | 192 - 265 | 28 - 48 | 1848 - 2258 | 192 - 343 | 219 - 255 | 15 - 33 | | | | |
| 89/ 1/20 | 20 | 8 8 - 838 | 25 - 43 | 265 - 269 | 28 - 48 | | | | | | | | |
| 89/ 1/20 | 20 | 1526 - 24 8 | 225 - 176 | 35 - 188 | 28 - 48 | 2854 - 2334 | 63 - 168 | 82 - 184 | 17 - 35 | | | | |
| 89/ 1/21 | 21 | 8 8 - 826 | 176 - 191 | 188 - 112 | 28 - 48 | 2853 - 2242 | 213 - 279 | 285 - 388 | 14 - 26 | | | | |
| 89/ 1/21 | 21 | 1522 - 24 8 | 13 - 326 | 238 - 311 | 28 - 48 | | | | | | | | |
| 89/ 1/22 | 22 | 8 8 - 822 | 326 - 339 | 311 - 315 | 28 - 48 | | | | | | | | |
| 89/ 1/22 | 22 | 1522 - 24 8 | 164 - 117 | 82 - 155 | 28 - 48 | | | | | | | | |
| 89/ 1/23 | 23 | 8 8 - 822 | 117 - 138 | 155 - 158 | 28 - 48 | | | | | | | | |
| 89/ 1/23 | 23 | 1515 - 24 8 | 318 - 267 | 284 - 358 | 28 - 48 | 2341 - 2357 | 256 - 265 | 356 - 358 | 18 - 23 | | | | |
| 89/ 1/24 | 24 | 8 8 - 815 | 267 - 276 | 358 - 1 | 28 - 48 | | | | | | | | |
| 89/ 1/24 | 24 | 1511 - 24 8 | 98 - 58 | 127 - 282 | 28 - 48 | 1828 - 2155 | 212 - 342 | 154 - 184 | 17 - 27 | | | | |
| 89/ 1/25 | 25 | 8 8 - 811 | 58 - 64 | 282 - 283 | 28 - 48 | | | | | | | | |
| 89/ 1/26 | 26 | 16 1 - 24 8 | 69 - 358 | 181 - 249 | 28 - 48 | 1928 - 2357 | 194 - 357 | 218 - 248 | 16 - 28 | | | | |
| 89/ 1/27 | 27 | 8 8 - 8 3 | 358 - 8 | 249 - 249 | 28 - 48 | | | | | | | | |
| 89/ 1/27 | 27 | 1512 - 24 8 | 198 - 149 | 18 - 92 | 28 - 48 | 1928 - 2359 | 348 - 148 | 53 - 92 | 16 - 34 | | | | |
| 89/ 1/28 | 28 | 1512 - 24 8 | 348 - 299 | 221 - 296 | 28 - 48 | 28 1 - 2258 | 155 - 262 | 252 - 287 | 14 - 27 | | | | |
| 89/ 1/28 | 28 | 1548 - 2359 | 383 - 248 | 273 - 342 | 28 - 48 | 1948 - 2358 | 83 - 239 | 386 - 342 | 16 - 26 | | | | |
| 89/ 1/31 | 31 | 1456 - 24 8 | 62 - 31 | 189 - 186 | 28 - 48 | 1632 - 21 4 | 128 - 284 | 123 - 161 | 17 - 34 | | | | |
| 89/ 2/ 1 | 32 | 1442 - 2339 | 284 - 168 | 311 - 26 | 28 - 48 | | | | | | | | |
| 89/ 2/ 2 | 33 | 1437 - 2348 | 351 - 319 | 153 - 238 | 28 - 48 | 2819 - 2239 | 198 - 282 | 282 - 221 | 18 - 28 | | | | |
| 89/ 2/ 3 | 34 | 1658 - 2335 | 222 - 187 | 16 - 73 | 28 - 48 | 1958 - 2338 | 331 - 189 | 41 - 73 | 16 - 24 | | | | |
| 89/ 2/ 4 | 35 | 1658 - 2258 | 12 - 238 | 219 - 278 | 28 - 48 | 1913 - 2328 | 99 - 248 | 239 - 274 | 18 - 28 | | | | |
| 89/ 2/ 5 | 36 | 1425 - 2225 | 75 - 5 | 42 - 118 | 28 - 48 | 1858 - 2135 | 235 - 335 | 79 - 183 | 15 - 24 | | | | |
| 89/ 2/ 6 | 37 | 1438 - 2222 | 228 - 154 | 246 - 313 | 28 - 48 | | | | | | | | |
| 89/ 2/ 7 | 38 | 1552 - 2318 | 68 - 338 | 181 - 164 | 28 - 48 | 1553 - 2223 | 69 - 385 | 181 - 156 | 16 - 36 | | | | |
| 89/ 2/ 8 | 39 | 1448 - 2315 | 175 - 127 | 294 - 7 | 28 - 48 | 16 8 - 1615 | 224 - 233 | 386 - 389 | 24 - 26 | | | | |
| 89/ 2/ 9 | 40 | 1448 - 2318 | 326 - 274 | 138 - 218 | 28 - 48 | 2112 - 2321 | 283 - 287 | 193 - 213 | 17 - 26 | | | | |
| 89/ 2/10 | 41 | 1523 - 23 7 | 142 - 63 | 347 - 53 | 28 - 48 | 18 8 - 1824 | 237 - 252 | 9 - 13 | 21 - 27 | | | | |
| 89/ 2/11 | 42 | 14 7 - 23 7 | 247 - 213 | 188 - 256 | 28 - 48 | 28 1 - 212 | 181 - 143 | 238 - 240 | 21 - 24 | | | | |
| 89/ 2/13 | 44 | 1418 - 2259 | 189 - 149 | 227 - 302 | 28 - 48 | 1518 - 16 8 | 225 - 268 | 235 - 244 | 38 - 34 | | | | |
| 89/ 2/14 | 45 | 1445 - 2253 | 1 - 296 | 75 - 144 | 28 - 48 | 1618 - 18 8 | 69 - 119 | 91 - 143 | 24 - 34 | | | | |
| 89/ 2/16 | 47 | 1445 - 2245 | 381 - 232 | 122 - 198 | 28 - 48 | 2155 - 2243 | 281 - 238 | 183 - 198 | 28 - 26 | | | | |
| 89/ 2/17 | 48 | 1442 - 2241 | 98 - 19 | 325 - 33 | 28 - 48 | | | | | | | | |
| 89/ 2/18 | 49 | 1438 - 2238 | 238 - 168 | 168 - 236 | 28 - 48 | | | | | | | | |
| 89/ 2/19 | 50 | 15 5 - 22 5 | 45 - 298 | 15 - 74 | 28 - 48 | 28 7 - 2159 | 227 - 295 | 58 - 74 | 28 - 38 | | | | |
| 89/ 2/21 | 52 | 1331 - 2231 | 138 - 185 | 205 - 281 | 28 - 48 | 1746 - 1911 | 83 - 134 | 85 - 97 | 18 - 34 | | | | |
| 89/ 2/22 | 53 | 1337 - 2224 | 82 - 41 | 253 - 327 | 28 - 48 | | | | | | | | |
| 89/ 2/24 | 55 | 1317 - 2117 | 11 - 381 | 297 - 4 | 28 - 48 | | | | | | | | |
| 89/ 2/28 | 59 | 1312 - 21 3 | 249 - 174 | 29 - 96 | 28 - 48 | 1837 - 1849 | 86 - 93 | 75 - 77 | 26 - 38 | | | | |
| 89/ 3/ 1 | 60 | 13 8 - 21 8 | 33 - 323 | 231 - 299 | 28 - 48 | 1943 - 21 3 | 126 - 174 | 85 - 96 | 28 - 34 | | | | |
| 89/ 3/ 2 | 61 | 13 8 - 21 8 | 183 - 113 | 74 - 142 | 28 - 48 | | | | | | | | |
| 89/ 3/ 3 | 62 | 1348 - 2853 | 357 - 259 | 283 - 345 | 28 - 48 | | | | | | | | |
| 89/ 3/ 4 | 63 | 1428 - 2153 | 172 - 86 | 132 - 196 | 28 - 48 | | | | | | | | |
| 89/ 3/ 5 | 64 | 1326 - 2845 | 298 - 195 | 329 - 38 | 28 - 48 | | | | | | | | |
| 89/ 3/ 6 | 65 | 13 8 - 2845 | 64 - 345 | 168 - 233 | 28 - 48 | 1647 - 1821 | 281 - 258 | 288 - 213 | 24 - 27 | | | | |
| 89/ 3/ 7 | 66 | 1248 - 2848 | 282 - 133 | 8 - 76 | 28 - 48 | | | | | | | | |
| 89/ 3/ 8 | 67 | 1327 - 2836 | 21 - 288 | 218 - 279 | 28 - 48 | | | | | | | | |
| 89/ 3/ 9 | 68 | 14 8 - 2832 | 191 - 68 | 66 - 122 | 28 - 48 | | | | | | | | |
| 89/ 3/10 | 69 | 1329 - 2829 | 323 - 217 | 265 - 324 | 28 - 48 | | | | | | | | |
| 89/ 3/11 | 70 | 1227 - 2824 | 76 - 4 | 188 - 167 | 28 - 48 | | | | | | | | |
| 89/ 3/12 | 71 | 1223 - 2821 | 224 - 153 | 383 - 18 | 28 - 48 | | | | | | | | |
| 89/ 3/13 | 72 | 1343 - 2836 | 62 - 388 | 157 - 215 | 28 - 48 | 1537 - 1644 | 131 - 172 | 173 - 183 | 28 - 38 | | | | |
| 89/ 3/14 | 73 | 1348 - 2116 | 211 - 126 | 8 - 64 | 28 - 48 | 1655 - 1659 | 329 - 331 | 84 - 82 | 54 - 54 | 22 - 24 | | | |
| 89/ 3/15 | 74 | 1361 - 2813</td | | | | | | | | | | | |

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|------------------|------------|------------------------|---------------------|-----------|---------|--------------|------------------------|---------------------|---------|-------|--------------|
| | | | CML III (1965.0) | IO | PHASE | WIDTH MHZ | | CML III (1965.0) | IO | PHASE | WIDTH MHZ |
| 89/ 4/11 | 181 | 1224 - 1847 | 53 - 285 | 282 - 336 | 27 - 48 | | | | | | |
| 89/ 4/12 | 182 | 1456 - 1844 | 158 - 73 | 112 - 179 | 28 - 48 | | | | | | |
| 89/ 4/13 | 183 | 1123 - 1848 | 317 - 221 | 328 - 21 | 28 - 48 | | | | | | |
| 89/ 4/14 | 184 | 1837 - 1837 | 79 - 9 | 156 - 224 | 28 - 48 | 14 1 - 15 9 | 283 - 244 | 185 - 195 | 22 - 24 | | |
| 89/ 4/15 | 185 | 1834 - 1834 | 228 - 158 | 359 - 67 | 28 - 48 | | | | | | |
| 89/ 4/16 | 186 | 1831 - 1831 | 16 - 386 | 282 - 278 | 28 - 48 | 1516 - 17 8 | 188 - 251 | 242 - 257 | 24 - 35 | | |
| 89/ 4/17 | 187 | 1121 - 1829 | 197 - 95 | 52 - 113 | 28 - 48 | | | | | | |
| 89/ 4/18 | 188 | 1825 - 1825 | 313 - 21 | 288 - 308 | 28 - 48 | | | | | | |
| 89/ 4/19 | 189 | 1822 - 1822 | 182 - 32 | 291 - 158 | 28 - 48 | | | | | | |
| 89/ 4/20 | 190 | 1838 - 1828 | 257 - 181 | 295 - 1 | 28 - 48 | | | | | | |
| 89/ 4/21 | 191 | 1816 - 1816 | 39 - 329 | 336 - 284 | 28 - 48 | 1443 - 1531 | 288 - 229 | 174 - 181 | 24 - 27 | | |
| 89/ 4/22 | 192 | 1812 - 1812 | 186 - 117 | 339 - 47 | 28 - 48 | | | | | | |
| 89/ 4/23 | 193 | 13 - 18 8 | 83 - 264 | 207 - 249 | 28 - 48 | | | | | | |
| 89/ 4/24 | 194 | 1815 - 18 6 | 129 - 53 | 26 - 92 | 28 - 48 | | | | | | |
| 89/ 4/25 | 195 | 18 5 - 18 3 | 273 - 282 | 288 - 295 | 28 - 48 | 1836 - 11 5 | 292 - 389 | 232 - 236 | 38 - 32 | | |
| 89/ 4/26 | 196 | 18 8 - 18 1 | 68 - 351 | 78 - 138 | 28 - 48 | 1849 - 13 2 | 98 - 178 | 77 - 96 | 26 - 35 | | |
| 89/ 4/27 | 197 | 958 - 1858 | 289 - 139 | 273 - 341 | 28 - 48 | | | | | | |
| 89/ 4/28 | 198 | 1828 - 1755 | 13 - 288 | 128 - 184 | 28 - 48 | | | | | | |
| 89/ 4/29 | 199 | 946 - 1751 | 143 - 76 | 318 - 27 | 28 - 48 | | | | | | |
| 89/ 4/30 | 200 | 949 - 1747 | 295 - 224 | 162 - 229 | 28 - 48 | 1711 - 1747 | 282 - 224 | 224 - 229 | 24 - 31 | | |
| 89/ 5/ 1 | 201 | 14 8 - 1745 | 92 - 13 | 7 - 72 | 28 - 48 | | | | | | |
| 89/ 5/ 2 | 202 | 943 - 1743 | 232 - 162 | 288 - 275 | 28 - 48 | 958 - 1228 | 241 - 327 | 218 - 238 | 24 - 38 | | |
| 89/ 5/ 3 | 203 | 948 - 1739 | 28 - 318 | 58 - 118 | 28 - 48 | 1111 - 1322 | 75 - 154 | 63 - 82 | 24 - 38 | | |
| 89/ 5/ 4 | 204 | 922 - 1722 | 191 - 121 | 187 - 255 | 28 - 48 | | | | | | |
| 89/ 5/ 5 | 205 | 924 - 1716 | 133 - 58 | 234 - 381 | 28 - 48 | | | | | | |
| 89/ 5/ 6 | 206 | 913 - 1713 | 276 - 286 | 76 - 144 | 28 - 48 | | | | | | |
| 89/ 5/ 7 | 207 | 9 9 - 16 9 | 64 - 318 | 279 - 338 | 28 - 48 | | | | | | |
| 89/ 5/ 8 | 208 | 9 5 - 16 5 | 212 - 186 | 121 - 181 | 28 - 48 | | | | | | |
| 89/ 5/ 9 | 209 | 9 1 - 16 1 | 8 - 254 | 324 - 23 | 28 - 48 | | | | | | |
| 89/ 5/ 10 | 210 | 9 2 - 17 8 | 151 - 88 | 167 - 235 | 28 - 48 | | | | | | |
| 89/ 5/ 11 | 211 | 858 - 1658 | 299 - 229 | 18 - 78 | 28 - 48 | 18 7 - 1832 | 348 - 356 | 28 - 23 | 28 - 32 | | |
| 89/ 5/ 12 | 212 | 1802 - 1655 | 128 - 17 | 222 - 201 | 28 - 48 | 1226 - 1329 | 215 - 253 | 243 - 252 | 24 - 36 | | |
| 89/ 5/ 13 | 213 | 819 - 1619 | 69 - 359 | 127 - 195 | 28 - 48 | | | | | | |
| 89/ 5/ 14 | 214 | 808 - 1617 | 288 - 148 | 344 - 38 | 28 - 48 | | | | | | |
| 89/ 5/ 15 | 215 | 814 - 918 | 6 - 45 | 173 - 182 | 28 - 48 | | | | | | |
| 89/ 5/ 16 | 216 | 8 7 - 16 8 | 383 - 233 | 218 - 286 | 28 - 48 | 1239 - 14 7 | 187 - 168 | 257 - 269 | 22 - 34 | | |
| 89/ 5/ 17 | 217 | 803 - 1634 | 48 - 337 | 193 - 268 | 28 - 48 | 1539 - 16 6 | 216 - 232 | 282 - 286 | 24 - 32 | | |
| 89/ 5/ 18 | 218 | 938 - 13 8 | 231 - 358 | 44 - 74 | 28 - 48 | | | | | | |
| 89/ 5/ 19 | 219 | 819 - 1619 | 69 - 359 | 127 - 195 | 28 - 48 | | | | | | |
| 89/ 5/ 20 | 220 | 808 - 1617 | 288 - 148 | 344 - 38 | 28 - 48 | | | | | | |
| 89/ 5/ 21 | 221 | 814 - 918 | 6 - 45 | 173 - 182 | 28 - 48 | | | | | | |
| 89/ 5/ 22 | 222 | 1424 - 1643 | 105 - 251 | 338 - 12 | 28 - 48 | 1554 - 1623 | 222 - 239 | 5 - 9 | 28 - 25 | | |
| 89/ 5/ 23 | 223 | 144 - 1637 | 347 - 188 | 11 - 58 | 28 - 48 | 1323 - 1418 | 221 - 258 | 234 - 248 | 24 - 35 | | |
| 89/ 5/ 24 | 224 | 145 - 1634 | 48 - 337 | 193 - 268 | 28 - 48 | 1445 - 15 7 | 271 - 284 | 245 - 248 | 28 - 32 | | |
| 89/ 5/ 25 | 225 | 146 - 1634 | 231 - 358 | 44 - 74 | 28 - 48 | | | | | | |
| 89/ 5/ 26 | 226 | 158 - 13 8 | 231 - 358 | 44 - 74 | 28 - 48 | | | | | | |
| 89/ 5/ 27 | 227 | 159 - 13 8 | 231 - 358 | 44 - 74 | 28 - 48 | | | | | | |
| 89/ 5/ 28 | 228 | 159 - 13 8 | 231 - 358 | 44 - 74 | 28 - 48 | | | | | | |
| 89/ 5/ 29 | 229 | 159 - 13 8 | 231 - 358 | 44 - 74 | 28 - 48 | | | | | | |
| 89/ 5/ 30 | 230 | 159 - 13 8 | 231 - 358 | 44 - 74 | 28 - 48 | | | | | | |
| 89/ 5/ 31 | 231 | 159 - 13 8 | 231 - 358 | 44 - 74 | 28 - 48 | | | | | | |
| 89/ 6/ 1 | 232 | 159 - 13 8 | 231 - 358 | 44 - 74 | 28 - 48 | | | | | | |
| 89/ 6/ 2 | 233 | 159 - 13 8 | 231 - 358 | 44 - 74 | 28 - 48 | | | | | | |
| 89/ 6/ 3 | 234 | 159 - 13 8 | 231 - 358 | 44 - 74 | 28 - 48 | | | | | | |
| 89/ 6/ 4 | 235 | 159 - 13 8 | 231 - 358 | 44 - 74 | 28 - 48 | | | | | | |
| 89/ 6/ 5 | 236 | 159 - 13 8 | 231 - 358 | 44 - 74 | 28 - 48 | | | | | | |
| 89/ 6/ 6 | 237 | 159 - 13 8 | 231 - 358 | 44 - 74 | 28 - 48 | | | | | | |
| 89/ 6/ 7 | 238 | 159 - 13 8 | 231 - 358 | 44 - 74 | 28 - 48 | | | | | | |
| 89/ 6/ 8 | 239 | 159 - 13 8 | 231 - 358 | 44 - 74 | 28 - 48 | | | | | | |
| 89/ 6/ 9 | 240 | 159 - 13 8 | 231 - 358 | 44 - 74 | 28 - 48 | | | | | | |
| 89/ 6/ 10 | 241 | 159 - 13 8 | 231 - 358 | 44 - 74 | 28 - 48 | | | | | | |
| 89/ 6/ 11 | 242 | 159 - 13 8 | 231 - 358 | 44 - 74 | 28 - 48 | | | | | | |
| 89/ 6/ 12 | 243 | 159 - 13 8 | 231 - 358 | 44 - 74 | 28 - 48 | | | | | | |
| 89/ 6/ 13 | 244 | 159 - 13 8 | 231 - 358 | 44 - 74 | 28 - 48 | | | | | | |
| 89/ 6/ 14 | 245 | 159 - 13 8 | 231 - 358 | 44 - 74 | 28 - 48 | | | | | | |
| 89/ 6/ 15 | 246 | 159 - 13 8 | 231 - 358 | 44 - 74 | 28 - 48 | | | | | | |
| 89/ 6/ 16 | 247 | 159 - 13 8 | 231 - 358 | 44 - 74 | 28 - 48 | | | | | | |
| 89/ 6/ 17 | 248 | 159 - 13 8 | 231 - 358 | 44 - 74 | 28 - 48 | | | | | | |
| 89/ 6/ 18 | 249 | 319 - 1114 | 13 - 388 | 58 - 117 | 28 - 48 | 8 9 - 1118 | 82 - 192 | 82 - 187 | 28 - 34 | | |
| 89/ 6/ 19 | 250 | 315 - 1115 | 161 - 91 | 253 - 321 | 28 - 48 | 746 - 915 | 196 - 258 | 184 - 197 | 22 - 28 | | |
| 89/ 6/ 20 | 251 | 312 - 1112 | 318 - 248 | 96 - 164 | 28 - 48 | 1811 - 1856 | 74 - 182 | 48 - 56 | 24 - 27 | | |
| 89/ 6/ 21 | 252 | 312 - 1112 | 188 - 31 | 299 - 7 | 28 - 48 | | | | | | |

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|------------------|------------|------------------------|---------------------|-----------|--------------|---------------------|------------------------|--------------|---------------------|----------|--------------|
| | | | CML III (1965.0) | IO PHASE | WIDTH MHZ | CML III (1965.0) | IO PHASE | WIDTH MHZ | CML III (1965.0) | IO PHASE | WIDTH MHZ |
| 89/9/18 | 253 | 3 8 - 11 8 | 248 - 179 | 142 - 218 | 28 - 48 | | | | | | |
| 89/9/11 | 254 | 3 4 - 11 8 | 37 - 324 | 345 - 52 | 28 - 48 | | | | | | |
| 89/9/12 | 255 | 259 - 1859 | 184 - 114 | 188 - 255 | 28 - 48 | | | | | | |
| 89/9/13 | 256 | 255 - 1855 | 332 - 262 | 30 - 98 | 28 - 48 | 327 - 437 | 281 - 243 | 191 - 281 | 18 - 22 | | |
| 89/9/14 | 257 | 252 - 1852 | 121 - 51 | 233 - 381 | 28 - 48 | 7 2 - 751 | 121 - 151 | 65 - 72 | 22 - 33 | | |
| 89/9/15 | 258 | 249 - 1849 | 269 - 280 | 76 - 144 | 28 - 48 | | | | | | |
| 89/9/16 | 259 | 245 - 1845 | 57 - 348 | 279 - 347 | 28 - 48 | 758 - 848 | 247 - 272 | 323 - 329 | 22 - 26 | | |
| 89/9/17 | 260 | 241 - 1841 | 285 - 136 | 122 - 198 | 28 - 48 | | | | | | |
| 89/9/18 | 261 | 635 - 1838 | 137 - 284 | 358 - 33 | 28 - 48 | | | | | | |
| 89/9/19 | 262 | 235 - 1835 | 143 - 73 | 168 - 236 | 28 - 48 | 436 - 728 | 216 - 328 | 185 - 289 | 13 - 25 | | |
| 89/9/20 | 263 | 232 - 1832 | 292 - 222 | 11 - 79 | 28 - 48 | 6 8 - 741 | 62 - 118 | 41 - 54 | 28 - 26 | | |
| 89/9/21 | 264 | 228 - 1828 | 88 - 18 | 214 - 281 | 28 - 48 | 522 - 734 | 185 - 265 | 238 - 257 | 18 - 37 | | |
| 89/9/22 | 265 | 225 - 1825 | 228 - 158 | 57 - 124 | 28 - 48 | 225 - 516 | 228 - 332 | 57 - 81 | 16 - 22 | | |
| 89/9/23 | 266 | 221 - 1822 | 16 - 387 | 259 - 327 | 28 - 48 | | | | | | |
| 89/9/24 | 267 | 217 - 1817 | 164 - 95 | 182 - 178 | 28 - 48 | 357 - 549 | 225 - 293 | 116 - 132 | 28 - 26 | | |
| 89/9/25 | 268 | 213 - 1813 | 313 - 243 | 345 - 13 | 28 - 48 | | | | | | |
| 89/9/26 | 269 | 211 - 1811 | 192 - 32 | 148 - 216 | 28 - 48 | 236 - 354 | 117 - 164 | 152 - 163 | 16 - 18 | | |
| | | | | | | 458 - 7 3 | 283 - 278 | 172 - 189 | 18 - 25 | | |
| 89/9/27 | 278 | 2 7 - 18 7 | 250 - 188 | 351 - 59 | 28 - 48 | 2 8 - 522 | 251 - 8 | 351 - 19 | 14 - 26 | | |
| 89/9/28 | 271 | 2 4 - 18 4 | 39 - 329 | 194 - 262 | 28 - 48 | 613 - 828 | 189 - 266 | 229 - 247 | 28 - 35 | | |
| 89/9/29 | 272 | 2 8 - 18 8 | 187 - 117 | 37 - 145 | 28 - 48 | 253 - 548 | 219 - 328 | 44 - 68 | 18 - 26 | | |
| 89/9/30 | 273 | 157 - 957 | 335 - 266 | 248 - 386 | 28 - 48 | 157 - 356 | 335 - 47 | 248 - 257 | 17 - 22 | | |
| 89/10/1 | 274 | 153 - 953 | 124 - 54 | 83 - 158 | 28 - 48 | 157 - 5 3 | 126 - 238 | 83 - 189 | 28 - 29 | | |
| 89/10/2 | 275 | 158 - 835 | 272 - 157 | 286 - 343 | 28 - 48 | | | | | | |
| 89/10/3 | 276 | 146 - 946 | 68 - 351 | 129 - 196 | 2 - 48 | 328 - 425 | 117 - 156 | 142 - 151 | 18 - 28 | | |
| | | | | | | 651 - 718 | 245 - 256 | 172 - 174 | 24 - 26 | | |
| 89/10/4 | 277 | 142 - 942 | 288 - 139 | 331 - 39 | 28 - 48 | | | | | | |
| 89/10/5 | 278 | 139 - 939 | 337 - 287 | 174 - 242 | 28 - 48 | | | | | | |
| 89/10/6 | 279 | 135 - 935 | 145 - 75 | 17 - 85 | 28 - 48 | 321 - 435 | 289 - 254 | 32 - 43 | 17 - 28 | | |
| 89/10/7 | 280 | 132 - 932 | 294 - 224 | 228 - 288 | 28 - 48 | 213 - 4 8 | 319 - 24 | 226 - 241 | 18 - 22 | | |
| 89/10/8 | 281 | 128 - 928 | 82 - 12 | 63 - 131 | 28 - 48 | 235 - 416 | 123 - 184 | 73 - 87 | 18 - 27 | | |
| 89/10/9 | 282 | 124 - 924 | 238 - 168 | 266 - 334 | 28 - 48 | 321 - 351 | 381 - 319 | 283 - 287 | 28 - 24 | | |
| 89/10/10 | 283 | 120 - 920 | 10 - 389 | 109 - 177 | 28 - 48 | | | | | | |
| 89/10/11 | 284 | 117 - 917 | 167 - 97 | 312 - 28 | 28 - 48 | 243 - 4 5 | 219 - 269 | 324 - 336 | 16 - 26 | | |
| 89/10/12 | 285 | 213 - 426 | 352 - 72 | 163 - 182 | 28 - 48 | | | | | | |
| 89/10/13 | 286 | 118 - 918 | 104 - 34 | 358 - 66 | 28 - 48 | | | | | | |
| 89/10/14 | 287 | 116 - 916 | 252 - 182 | 281 - 269 | 28 - 48 | 1 6 - 318 | 252 - 327 | 281 - 219 | 18 - 28 | | |
| 89/10/15 | 288 | 12 - 92 | 48 - 331 | 44 - 111 | 28 - 48 | 1 3 - 437 | 11 - 178 | 44 - 74 | 18 - 28 | | |
| 89/10/16 | 289 | 458 - 828 | 188 - 96 | 246 - 389 | 28 - 48 | 147 - 421 | 218 - 5 | 253 - 275 | 28 - 32 | | |
| 89/10/17 | 290 | 855 - 855 | 337 - 267 | 98 - 157 | 28 - 48 | 4 6 - 547 | 93 - 154 | 117 - 22 | 22 - 24 | | |
| | | | | | | 711 - 818 | 285 - 245 | 143 - 152 | 28 - 22 | | |
| 89/10/18 | 291 | 858 - 858 | 125 - 55 | 292 - 8 | 28 - 48 | | | | | | |
| 89/10/19 | 292 | 847 - 847 | 274 - 284 | 135 - 283 | 28 - 48 | 453 - 5 6 | 62 - 78 | 178 - 172 | 28 - 22 | | |
| 89/10/20 | 293 | 843 - 844 | 62 - 352 | 338 - 46 | 28 - 48 | 152 - 251 | 183 - 139 | 348 - 356 | 17 - 27 | | |
| 89/10/21 | 294 | 839 - 839 | 218 - 148 | 181 - 249 | 28 - 48 | 455 - 634 | 214 - 274 | 14 - 28 | 17 - 24 | | |
| 89/10/22 | 295 | 835 - 835 | 358 - 288 | 24 - 92 | 28 - 48 | 836 - 246 | 359 - 77 | 24 - 43 | 16 - 18 | | |
| | | | | | | 641 - 7 6 | 219 - 234 | 76 - 79 | 18 - 26 | | |
| 89/10/23 | 296 | 831 - 831 | 146 - 76 | 227 - 295 | 28 - 48 | 128 - 551 | 176 - 348 | 234 - 272 | 14 - 36 | | |
| 89/10/24 | 297 | 828 - 828 | 295 - 225 | 78 - 138 | 28 - 48 | 833 - 5 2 | 298 - 181 | 71 - 189 | 12 - 28 | | |
| 89/10/25 | 298 | 824 - 824 | 83 - 13 | 273 - 341 | 28 - 48 | 213 - 216 | 149 - 151 | 288 - 289 | 14 - 16 | | |
| 89/10/26 | 299 | 828 - 828 | 231 - 162 | 116 - 184 | 28 - 48 | 124 - 554 | 278 - 73 | 125 - 163 | 16 - 19 | | |
| | | | | | | 223 - 328 | 386 - 345 | 133 - 142 | 16 - 24 | | |
| 89/10/27 | 300 | 816 - 816 | 19 - 318 | 319 - 27 | 28 - 48 | 134 - 236 | 67 - 184 | 330 - 339 | 16 - 24 | | |
| 89/10/28 | 301 | 812 - 812 | 168 - 98 | 162 - 238 | 28 - 48 | 128 - 411 | 131 - 162 | 345 - 352 | 16 - 24 | | |
| 89/10/29 | 302 | 812 - 812 | 318 - 248 | 5 - 73 | 28 - 48 | 812 - 122 | 318 - 1 | 5 - 15 | 16 - 24 | | |
| | | | | | | 246 - 349 | 51 - 89 | 27 - 36 | 16 - 28 | | |
| 89/10/30 | 303 | 812 - 812 | 189 - 39 | 289 - 277 | 28 - 48 | 128 - 553 | 158 - 315 | 210 - 257 | 18 - 34 | | |
| 89/10/31 | 304 | 812 - 812 | 250 - 198 | 52 - 128 | 28 - 48 | 647 - 6 7 | 182 - 114 | 188 - 182 | 28 - 36 | | |
| 89/10/32 | 304 | 256 - 24 8 | 45 - 43 | 254 - 254 | 28 - 48 | | | | | | |
| 89/11/1 | 305 | 815 - 756 | 43 - 331 | 254 - 321 | 28 - 48 | | | | | | |
| 89/11/2 | 306 | 815 - 756 | 191 - 193 | 97 - 98 | 28 - 48 | | | | | | |
| 89/11/3 | 306 | 2435 - 24 8 | 335 - 344 | 299 - 381 | 28 - 48 | | | | | | |
| 89/11/4 | 307 | 817 - 745 | 344 - 265 | 381 - 7 | 28 - 48 | | | | | | |
| 89/11/5 | 307 | 2345 - 24 8 | 126 - 135 | 143 - 145 | 28 - 48 | | | | | | |
| 89/11/6 | 308 | 818 - 745 | 135 - 56 | 145 - 218 | 28 - 48 | 225 - 349 | 222 - 273 | 165 - 177 | 16 - 27 | | |
| 89/11/7 | 308 | 2348 - 24 8 | 273 - 285 | 345 - 348 | 28 - 48 | | | | | | |
| 89/11/8 | 313 | 813 - 725 | 168 - 77 | 82 - 145 | 28 - 48 | | | | | | |
| 89/11/9 | 313 | 2328 - 24 8 | 294 - 318 | 288 - 286 | 28 - 48 | 155 - 438 | 237 - 336 | 99 - 122 | 13 - 24 | | |
| 89/11/10 | 314 | 814 - 728 | 318 - 224 | 206 - 348 | 28 - 48 | | | | | | |
| 89/11/11 | 314 | 2316 - 24 8 | 83 - 189 | 123 - 129 | 28 - 48 | 326 - 351 | 83 - 98 | 315 - 318 | 28 - 25 | | |
| 89/11/11 | 315 | 816 - 716 | 189 - 13 | 129 - 191 | 28 - 48 | | | | | | |
| 89/11/12 | 315 | 2312 - 24 8 | 231 - 268 | 326 - 333 | 28 - 48 | 222 - 535 | 195 - 312 | 149 - 177 | 14 - 27 | | |
| 89/11/12 | 316 | 816 - 712 | 268 - 161 | 333 - 34 | 28 - 48 | | | | | | |
| 89/11/13 | 316 | 2316 - 24 8 | 19 - 58 | 169 - 176 | 28 - 48 | | | | | | |
| 89/11/13 | 317 | 817 - 7 8 | 58 - 348 | 176 - 237 | 28 - 48 | 217 - 515 | 133 - 241 | 196 - 221 | 28 - 33 | | |
| 89/11/14 | 318 | 231 - 24 8 | 167 - 281 | 12 - 28 | 28 - 48 | | | | | | |
| | | | 281 - 97 | 28 - 88 | 849 - 116 | 231 - 247 | 27 - 31 | 16 - 26 | | | |
| | | | | | 156 - 312 | 271 - 317 | 36 - 47 | 16 - 22 | | | |
| 89/11/14 | 318 | 2259 - 24 8 | 315 - 352 | 215 - 224 | 28 - 48 | | | | | | |
| 89/11/15 | 319 | 817 - 7 8 | 352 - 246 | 224 - 283 | 28 - 48 | 117 - 544 | 38 - 288 | 234 - 272 | 13 - 33 | | |
| 89/11/16 | 319 | 2255 - 24 8 | 183 - 142 | 58 - 67 | 28 - 48 | 2256 - 24 8 | 184 - 142 | 58 - 67 | 15 - 26 | | |
| 89/11/16 | 320 | 818 - 656 | 142 - 34 | 67 - 126 | 28 - 48 | 818 - 432 | 153 - 387 | 78 - 186 | 16 - 27 | | |
| 89/11/16 | 320 | 2251 - 24 8 | 251 - 293 | 261 - 271 | 28 - 48 | | | | | | |
| 89/11/17 | 321 | 819 - 651 | 293 - 181 | 271 - 329 | 28 - 48 | 8 8 - 316 | 293 - 51 | 271 - 298 | 13 - 26 | | |
| 89/11/17 | 321 | 2247 - 24 8 | 39 - 84 | 184 - 114 | 28 - 48 | | | | | | |
| 89/11/18 | 322 | 818 - 647 | 84 - 330 | 114 - 172 | 28 - 48 | 835 - 1 5 | 185 - 123 | 119 - 123 | 18 - 28 | | |
| 89/11/18 | 322 | 2247 - 24 8 | 198 - 234 | 388 - 318 | 28 - 48 | 2322 - 24 8 | 211 - 234 | 312 - 318 | 16 - 24 | | |
| 89/11/19 | 323 | 818 - 647 | 234 - 128 | 318 - 15 | 28 - 48 | 8 8 - 256 | 234 - 341 | 318 - 343 | 14 - 26 | | |
| | | | | | 325 - 6 9 | 358 - 97 | 347 - 18 | 14 - 27 | | | |
| 89/11/19 | 323 | 2239 - 24 8 | 336 - 25 | 158 - 161 | 28 - 48 | | | | | | |
| 89/11/20 | 324 | 818 - 639 | 25 - 266 | 161 - 218 | 28 - 48 | 548 - 6 6 | 235 - 246 | 211 - 213 | 28 - 23 | | |
| 89/11/21 | 325 | 818 - 634 | 1 | | | | | | | | |

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| DATE YY/MM/DD | DOY JJJ | TIME UT HHMM - HHMM | OBSERVATIONS | | | | TIME UT HHMM - HHMM | EMISSIONS | | | |
|------------------|------------|------------------------|---------------------|-------------|--------------|---------------------|------------------------|-------------|--------------|--|--|
| | | | CML III (1965.8) | IO PHASE | WIDTH MHZ | CML III (1965.8) | | IO PHASE | WIDTH MHZ | | |
| 89/11/24 | 328 | 2218 - 24 0 | 357 - 58 | 85 - 99 | 20 - 40 | | | | | | |
| 89/11/25 | 329 | 0 0 - 617 | 58 - 286 | 99 - 153 | 20 - 40 | 835 - 324 | 79 - 182 | 184 - 128 | 16 - 22 | | |
| | | | | | | 445 - 556 | 231 - 274 | 148 - 150 | 15 - 26 | | |
| 89/11/25 | 329 | 22 0 - 24 0 | 141 - 289 | 287 - 303 | 20 - 40 | | | | | | |
| 89/11/26 | 330 | 0 0 - 6 0 | 289 - 71 | 303 - 355 | 20 - 40 | 858 - 423 | 239 - 8 | 318 - 348 | 18 - 25 | | |
| 89/11/26 | 330 | 22 4 - 24 0 | 289 - 0 | 138 - 146 | 20 - 40 | | | | | | |
| 89/11/27 | 331 | 0 0 - 6 4 | 0 - 220 | 146 - 198 | 20 - 40 | | | | | | |
| 89/11/27 | 331 | 22 4 - 24 0 | 00 - 158 | 334 - 350 | 20 - 40 | | | | | | |
| 89/11/28 | 332 | 0 0 - 6 5 | 158 - 11 | 350 - 42 | 20 - 40 | | | | | | |
| 89/11/28 | 332 | 22 0 - 24 0 | 220 - 301 | 177 - 194 | 20 - 40 | 22 0 - 22 7 | 220 - 233 | 177 - 178 | 21 - 26 | | |
| 89/11/29 | 333 | 0 0 - 6 0 | 301 - 159 | 194 - 245 | 20 - 40 | 428 - 534 | 183 - 143 | 232 - 241 | 16 - 24 | | |
| 89/11/29 | 333 | 2156 - 24 0 | 17 - 92 | 20 - 37 | 20 - 40 | | | | | | |
| 89/11/30 | 334 | 0 0 - 556 | 92 - 387 | 37 - 88 | 20 - 40 | 124 - 5 7 | 142 - 277 | 49 - 81 | 14 - 29 | | |
| 89/11/30 | 334 | 2151 - 24 0 | 164 - 242 | 223 - 241 | 20 - 40 | | | | | | |
| 89/12/1 | 335 | 0 0 - 551 | 242 - 95 | 241 - 290 | 20 - 40 | | | | | | |
| 89/12/1 | 335 | 2146 - 24 0 | 312 - 33 | 65 - 84 | 20 - 40 | | | | | | |
| 89/12/2 | 336 | 0 0 - 546 | 33 - 242 | 84 - 133 | 20 - 40 | 1 7 - 546 | 73 - 242 | 94 - 133 | 16 - 38 | | |
| 89/12/2 | 336 | 2146 - 24 0 | 183 - 184 | 269 - 288 | 20 - 40 | | | | | | |
| 89/12/3 | 337 | 0 0 - 546 | 184 - 33 | 288 - 337 | 20 - 40 | 1 5 - 5 0 | 223 - 5 | 297 - 338 | 12 - 25 | | |
| 89/12/3 | 337 | 2142 - 24 0 | 251 - 334 | 112 - 132 | 20 - 40 | 2146 - 2340 | 253 - 327 | 113 - 138 | 14 - 23 | | |
| 89/12/4 | 338 | 0 0 - 544 | 334 - 182 | 132 - 180 | 20 - 40 | 432 - 544 | 139 - 182 | 170 - 188 | 18 - 25 | | |
| 89/12/4 | 338 | 2134 - 24 0 | 37 - 125 | 315 - 335 | 20 - 40 | 22 3 - 24 0 | 54 - 125 | 319 - 335 | 12 - 26 | | |
| 89/12/5 | 339 | 0 0 - 535 | 125 - 328 | 335 - 23 | 20 - 40 | 0 0 - 534 | 125 - 327 | 335 - 22 | 14 - 27 | | |
| 89/12/5 | 339 | 2129 - 24 0 | 184 - 276 | 157 - 179 | 20 - 40 | 2159 - 24 0 | 283 - 276 | 162 - 179 | 18 - 28 | | |
| 89/12/6 | 340 | 0 0 - 529 | 276 - 115 | 179 - 225 | 20 - 40 | 0 0 - 518 | 276 - 188 | 175 - 224 | 12 - 28 | | |
| 89/12/6 | 340 | 2125 - 24 0 | 333 - 66 | 1 - 22 | 20 - 40 | | | | | | |
| 89/12/7 | 341 | 0 0 - 526 | 66 - 263 | 22 - 69 | 20 - 40 | 2 3 - 526 | 141 - 263 | 40 - 69 | 14 - 28 | | |
| 89/12/7 | 341 | 2129 - 24 0 | 120 - 217 | 283 - 226 | 20 - 40 | 2134 - 24 0 | 129 - 217 | 285 - 226 | 16 - 24 | | |
| 89/12/8 | 342 | 0 0 - 528 | 217 - 51 | 226 - 271 | 20 - 40 | 0 0 - 521 | 217 - 321 | 226 - 258 | 14 - 31 | | |
| 89/12/8 | 342 | 2116 - 24 0 | 269 - 8 | 46 - 70 | 20 - 40 | 2124 - 24 0 | 273 - 8 | 49 - 70 | 16 - 24 | | |
| 89/12/9 | 343 | 0 0 - 516 | 8 - 199 | 70 - 114 | 20 - 40 | 0 0 - 515 | 8 - 198 | 70 - 114 | 18 - 38 | | |
| 89/12/9 | 343 | 2112 - 24 0 | 57 - 150 | 258 - 273 | 20 - 40 | 2138 - 24 0 | 68 - 150 | 252 - 273 | 15 - 27 | | |
| 89/12/10 | 344 | 0 0 - 512 | 158 - 347 | 273 - 317 | 20 - 40 | | | | | | |
| 89/12/10 | 344 | 21 8 - 24 0 | 295 - 389 | 93 - 117 | 20 - 40 | | | | | | |
| 89/12/11 | 345 | 0 0 - 508 | 389 - 135 | 117 - 160 | 20 - 40 | 0 0 - 132 | 309 - 5 | 117 - 138 | 14 - 27 | | |
| 89/12/11 | 345 | 21 8 - 24 0 | 356 - 160 | 296 - 321 | 20 - 40 | 2325 - 24 0 | 79 - 180 | 316 - 321 | 16 - 38 | | |
| 89/12/12 | 346 | 0 0 - 508 | 100 - 286 | 321 - 4 | 20 - 40 | 347 - 5 7 | 237 - 285 | 353 - 4 | 20 - 38 | | |
| 89/12/12 | 346 | 21 3 - 24 0 | 143 - 258 | 139 - 164 | 20 - 40 | 2238 - 24 0 | 281 - 258 | 153 - 164 | 13 - 26 | | |
| 89/12/13 | 347 | 0 0 - 503 | 250 - 74 | 164 - 287 | 20 - 40 | 0 0 - 659 | 250 - 286 | 164 - 172 | 16 - 38 | | |
| 89/12/13 | 347 | 2058 - 24 0 | 291 - 41 | 342 - 8 | 20 - 40 | 2058 - 2154 | 291 - 325 | 342 - 358 | 16 - 22 | | |
| 89/12/14 | 348 | 0 0 - 458 | 41 - 221 | 8 - 50 | 20 - 40 | 0 0 - 354 | 41 - 183 | 0 - 41 | 13 - 26 | | |
| 89/12/14 | 348 | 2054 - 24 0 | 79 - 192 | 185 - 211 | 20 - 40 | 2247 - 2339 | 148 - 179 | 281 - 288 | 14 - 21 | | |
| 89/12/15 | 349 | 0 0 - 454 | 192 - 10 | 211 - 253 | 20 - 40 | | | | | | |
| 89/12/15 | 349 | 2049 - 24 0 | 227 - 342 | 28 - 55 | 20 - 40 | 2049 - 24 0 | 227 - 342 | 28 - 55 | 13 - 26 | | |
| 89/12/16 | 350 | 0 0 - 449 | 342 - 157 | 55 - 96 | 20 - 40 | 0 13 - 649 | 358 - 12 | 57 - 62 | 20 - 26 | | |
| 89/12/16 | 350 | 2044 - 24 0 | 15 - 133 | 231 - 259 | 20 - 40 | 23 7 - 2342 | 181 - 122 | 251 - 256 | 16 - 22 | | |
| 89/12/17 | 351 | 0 0 - 444 | 133 - 295 | 259 - 299 | 20 - 40 | 0 0 - 649 | 133 - 163 | 259 - 266 | 13 - 26 | | |
| 89/12/17 | 351 | 2044 - 24 0 | 165 - 284 | 75 - 162 | 20 - 40 | | | | | | |
| 89/12/18 | 352 | 0 0 - 444 | 284 - 96 | 182 - 142 | 20 - 40 | 316 - 422 | 42 - 82 | 130 - 139 | 16 - 38 | | |
| 89/12/18 | 352 | 2041 - 24 0 | 314 - 75 | 278 - 306 | 20 - 40 | | | | | | |
| 89/12/19 | 353 | 0 0 - 441 | 75 - 244 | 386 - 346 | 20 - 40 | | | | | | |
| 89/12/19 | 353 | 2031 - 24 0 | 99 - 225 | 120 - 149 | 20 - 40 | | | | | | |
| 89/12/20 | 354 | 0 0 - 431 | 225 - 29 | 149 - 168 | 20 - 40 | 0 9 - 637 | 231 - 248 | 151 - 155 | 14 - 16 | | |
| 89/12/20 | 354 | 2027 - 24 0 | 247 - 16 | 323 - 353 | 20 - 40 | 2038 - 2236 | 254 - 325 | 325 - 341 | 14 - 22 | | |
| 89/12/21 | 355 | 0 0 - 427 | 16 - 177 | 353 - 31 | 20 - 40 | | | | | | |
| 89/12/21 | 355 | 2022 - 24 0 | 35 - 167 | 166 - 197 | 20 - 40 | 2228 - 2342 | 186 - 156 | 183 - 194 | 14 - 28 | | |
| 89/12/22 | 356 | 0 0 - 422 | 167 - 325 | 197 - 234 | 20 - 40 | | | | | | |
| 89/12/22 | 356 | 2018 - 24 0 | 183 - 317 | 9 - 40 | 20 - 40 | | | | | | |
| 89/12/23 | 357 | 0 0 - 418 | 317 - 113 | 40 - 77 | 20 - 40 | 0 21 - 418 | 330 - 113 | 43 - 77 | 18 - 34 | | |
| 89/12/23 | 357 | 2013 - 24 0 | 331 - 108 | 212 - 244 | 20 - 40 | 0 0 - 413 | 188 - 261 | 244 - 288 | 13 - 34 | | |
| 89/12/24 | 358 | 0 0 - 413 | 188 - 261 | 244 - 290 | 20 - 40 | | | | | | |
| 89/12/24 | 358 | 20 9 - 24 0 | 119 - 259 | 55 - 80 | 20 - 40 | 355 - 4 8 | 41 - 49 | 121 - 123 | 16 - 24 | | |
| 89/12/25 | 359 | 0 0 - 4 9 | 259 - 49 | 80 - 123 | 20 - 40 | | | | | | |
| 89/12/25 | 359 | 20 8 - 24 0 | 267 - 49 | 258 - 291 | 20 - 40 | 355 - 4 8 | 41 - 49 | 121 - 123 | 16 - 24 | | |
| 89/12/26 | 360 | 0 0 - 4 5 | 49 - 197 | 291 - 326 | 20 - 40 | | | | | | |
| 89/12/26 | 360 | 1955 - 24 0 | 52 - 200 | 100 - 135 | 20 - 40 | 2051 - 2146 | 86 - 119 | 100 - 116 | 16 - 28 | | |
| 89/12/27 | 361 | 0 0 - 355 | 200 - 342 | 135 - 168 | 20 - 40 | | | | | | |
| 89/12/27 | 361 | 1950 - 24 0 | 199 - 351 | 303 - 338 | 20 - 40 | 23 5 - 24 0 | 317 - 351 | 331 - 338 | 18 - 38 | | |
| 89/12/28 | 362 | 0 0 - 351 | 351 - 130 | 338 - 11 | 20 - 40 | 0 0 - 244 | 351 - 98 | 338 - 2 | 16 - 24 | | |
| 89/12/28 | 362 | 1946 - 24 0 | 348 - 141 | 146 - 182 | 20 - 40 | | | | | | |
| 89/12/29 | 363 | 0 0 - 346 | 141 - 278 | 182 - 214 | 20 - 40 | 0 0 - 347 | 141 - 279 | 182 - 214 | 16 - 38 | | |
| 89/12/29 | 363 | 1942 - 24 0 | 136 - 292 | 349 - 26 | 20 - 40 | 2239 - 24 0 | 243 - 292 | 14 - 26 | 20 - 22 | | |
| 89/12/30 | 364 | 0 0 - 342 | 292 - 66 | 26 - 57 | 20 - 40 | | | | | | |
| 89/12/30 | 364 | 1938 - 24 0 | 284 - 83 | 192 - 229 | 20 - 40 | 2021 - 2112 | 310 - 341 | 198 - 286 | 18 - 25 | | |
| 89/12/31 | 365 | 0 0 - 338 | 83 - 214 | 229 - 268 | 20 - 40 | 0 0 - 333 | 83 - 211 | 229 - 259 | 14 - 22 | | |

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| DATE YY/MM/DD | DOY JJJ | TIME UT HHMM - HHMM | OBSERVATIONS | | | | WIDTH MHZ | EMISSIONS | | | | WIDTH MHZ |
|------------------|------------|------------------------|---------------------|-----------|---------|---------------------|--------------|-------------|-----------|-----------|---------|--------------|
| | | | CML III (1965.0) | IO | PHASE | CML III (1965.0) | | IO | PHASE | | | |
| 98/ 1/ 1 | 1 | 1938 - 24 0 | 221 - 24 | 238 - 277 | 10 - 40 | | | | | | | |
| 98/ 1/ 2 | 2 | 08 0 - 330 | 24 - 151 | 277 - 386 | 10 - 40 | | | | | | | |
| 98/ 1/ 2 | 2 | 1924 - 24 0 | 8 - 175 | 81 - 120 | 10 - 40 | | | | | | | |
| 98/ 1/ 3 | 3 | 08 0 - 324 | 175 - 298 | 120 - 149 | 10 - 40 | | | | | | | |
| 98/ 1/ 3 | 3 | 1920 - 24 0 | 156 - 325 | 284 - 324 | 10 - 40 | | | 2121 - 2350 | 229 - 324 | 301 - 324 | 13 - 26 | |
| 98/ 1/ 4 | 4 | 08 0 - 326 | 325 - 86 | 324 - 352 | 10 - 40 | | | 128 - 315 | 18 - 83 | 336 - 351 | 14 - 24 | |
| 98/ 1/ 4 | 4 | 1915 - 24 0 | 384 - 116 | 127 - 167 | 10 - 40 | | | | | | | |
| 98/ 1/ 5 | 5 | 08 0 - 315 | 116 - 234 | 167 - 195 | 10 - 40 | | | | | | | |
| 98/ 1/ 5 | 5 | 1918 - 24 0 | 91 - 267 | 338 - 11 | 10 - 40 | | | 2230 - 24 0 | 212 - 267 | 358 - 11 | 14 - 18 | |
| 98/ 1/ 6 | 6 | 08 0 - 318 | 267 - 21 | 11 - 38 | 10 - 40 | | | 010 - 310 | 273 - 21 | 12 - 38 | 16 - 24 | |
| 98/ 1/ 6 | 6 | 19 6 - 24 0 | 239 - 57 | 173 - 215 | 10 - 40 | | | 1920 - 2130 | 248 - 327 | 175 - 193 | 13 - 25 | |
| 98/ 1/ 7 | 7 | 19 4 - 24 0 | 29 - 288 | 16 - 58 | 10 - 40 | | | 08 0 - 2 9 | 57 - 135 | 215 - 233 | 13 - 26 | |
| 98/ 1/ 7 | 7 | 18 8 - 24 0 | 288 - 319 | 58 - 84 | 10 - 40 | | | 115 - 250 | 253 - 311 | 69 - 82 | 14 - 25 | |
| 98/ 1/ 8 | 8 | 08 0 - 3 4 | 193 - 359 | 219 - 262 | 10 - 40 | | | 1939 - 2352 | 281 - 354 | 225 - 261 | 13 - 31 | |
| 98/ 1/ 8 | 8 | 1857 - 24 0 | 359 - 106 | 262 - 287 | 10 - 40 | | | 010 - 236 | 5 - 93 | 263 - 284 | 13 - 27 | |
| 98/ 1/ 9 | 9 | 08 0 - 257 | 323 - 149 | 62 - 186 | 10 - 40 | | | 2210 - 24 0 | 83 - 149 | 90 - 106 | 14 - 24 | |
| 98/ 1/ 9 | 9 | 1852 - 24 0 | 149 - 256 | 186 - 131 | 10 - 40 | | | | | | | |
| 98/ 1/10 | 10 | 08 0 - 257 | 149 - 256 | 186 - 131 | 10 - 40 | | | | | | | |
| 98/ 1/10 | 10 | 1848 - 24 0 | 111 - 380 | 265 - 389 | 10 - 40 | | | 2143 - 24 0 | 217 - 380 | 290 - 389 | 14 - 22 | |
| 98/ 1/11 | 11 | 08 0 - 248 | 380 - 41 | 309 - 333 | 10 - 40 | | | 08 0 - 248 | 380 - 41 | 380 - 333 | 10 - 36 | |
| 98/ 1/11 | 11 | 1843 - 24 0 | 259 - 98 | 180 - 153 | 10 - 40 | | | | | | | |
| 98/ 1/12 | 12 | 08 0 - 243 | 98 - 189 | 153 - 176 | 10 - 40 | | | 08 0 - 126 | 98 - 142 | 153 - 165 | 13 - 26 | |
| 98/ 1/12 | 12 | 1839 - 24 0 | 47 - 241 | 311 - 356 | 10 - 40 | | | 2324 - 24 0 | 219 - 241 | 351 - 356 | 13 - 25 | |
| 98/ 1/13 | 13 | 08 0 - 239 | 241 - 337 | 356 - 19 | 10 - 40 | | | 134 - 229 | 298 - 331 | 10 - 17 | 14 - 18 | |
| 98/ 1/13 | 13 | 1834 - 24 0 | 195 - 32 | 154 - 280 | 10 - 40 | | | 1918 - 2122 | 221 - 296 | 160 - 178 | 15 - 26 | |
| 98/ 1/14 | 14 | 08 0 - 234 | 32 - 125 | 200 - 222 | 10 - 40 | | | | | | | |
| 98/ 1/14 | 14 | 1830 - 24 0 | 343 - 182 | 357 - 44 | 10 - 40 | | | 08 0 - 157 | 32 - 182 | 200 - 217 | 13 - 25 | |
| 98/ 1/15 | 15 | 08 0 - 238 | 182 - 273 | 44 - 65 | 10 - 40 | | | | | | | |
| 98/ 1/15 | 15 | 1825 - 24 0 | 130 - 333 | 200 - 247 | 10 - 40 | | | 23 4 - 2335 | 299 - 318 | 239 - 244 | 16 - 22 | |
| 98/ 1/16 | 16 | 08 0 - 225 | 333 - 61 | 247 - 268 | 10 - 40 | | | | | | | |
| 98/ 1/16 | 16 | 1821 - 24 0 | 279 - 124 | 43 - 91 | 10 - 40 | | | 2250 - 24 0 | 81 - 124 | 81 - 91 | 16 - 31 | |
| 98/ 1/17 | 17 | 08 0 - 221 | 124 - 289 | 91 - 111 | 10 - 40 | | | 08 0 - 827 | 124 - 148 | 91 - 95 | 16 - 31 | |
| 98/ 1/17 | 17 | 1817 - 24 0 | 67 - 274 | 246 - 294 | 10 - 40 | | | 1947 - 21 5 | 121 - 168 | 259 - 270 | 18 - 28 | |
| 98/ 1/18 | 18 | 08 0 - 217 | 274 - 357 | 294 - 314 | 10 - 40 | | | 23 3 - 24 0 | 248 - 274 | 206 - 294 | 16 - 24 | |
| 98/ 1/18 | 18 | 1812 - 24 0 | 214 - 65 | 89 - 138 | 10 - 40 | | | 08 0 - 147 | 274 - 339 | 294 - 389 | 16 - 24 | |
| 98/ 1/19 | 19 | 08 0 - 212 | 65 - 145 | 138 - 157 | 10 - 40 | | | 21 3 - 24 0 | 280 - 387 | 287 - 232 | 14 - 28 | |
| 98/ 1/19 | 19 | 18 8 - 24 0 | 3 - 215 | 292 - 342 | 10 - 40 | | | 08 0 - 159 | 387 - 19 | 232 - 249 | 14 - 28 | |
| 98/ 1/20 | 20 | 08 0 - 2 9 | 215 - 293 | 342 - 0 | 10 - 40 | | | 1921 - 2152 | 238 - 322 | 84 - 185 | 16 - 24 | |
| 98/ 1/20 | 20 | 18 4 - 24 0 | 151 - 6 | 135 - 185 | 10 - 40 | | | 08 7 - 2 8 | 220 - 293 | 343 - 0 | 13 - 36 | |
| 98/ 1/21 | 21 | 08 0 - 2 4 | 6 - 81 | 105 - 283 | 10 - 40 | | | | | | | |
| 98/ 1/22 | 22 | 1855 - 24 0 | 123 - 387 | 189 - 232 | 10 - 40 | | | 21 3 - 24 0 | 280 - 387 | 287 - 232 | 14 - 28 | |
| 98/ 1/23 | 23 | 08 0 - 255 | 387 - 53 | 232 - 257 | 10 - 40 | | | 08 0 - 159 | 387 - 19 | 232 - 249 | 14 - 28 | |
| 98/ 1/25 | 25 | 1844 - 24 0 | 208 - 39 | 78 - 123 | 10 - 40 | | | 1921 - 2152 | 238 - 322 | 84 - 185 | 16 - 24 | |
| 98/ 1/26 | 26 | 08 0 - 241 | 39 - 136 | 123 - 146 | 10 - 40 | | | | | | | |
| 98/ 1/26 | 26 | 1737 - 24 0 | 318 - 190 | 272 - 327 | 10 - 40 | | | 123 - 240 | 89 - 136 | 135 - 146 | 16 - 26 | |
| 98/ 1/27 | 27 | 08 0 - 137 | 198 - 248 | 327 - 348 | 10 - 40 | | | | | | | |
| 98/ 1/29 | 29 | 1824 - 24 0 | 78 - 281 | 178 - 217 | 10 - 40 | | | | | | | |
| 98/ 1/30 | 30 | 08 0 - 224 | 281 - 0 | 217 - 238 | 10 - 40 | | | | | | | |
| 98/ 1/30 | 30 | 1719 - 24 0 | 189 - 72 | 4 - 61 | 10 - 40 | | | 2359 - 24 0 | 71 - 72 | 61 - 61 | 16 - 38 | |
| 98/ 1/31 | 31 | 08 0 - 119 | 72 - 120 | 61 - 72 | 10 - 40 | | | 08 0 - 152 | 72 - 140 | 61 - 77 | 16 - 38 | |
| 98/ 1/31 | 31 | 1716 - 24 0 | 338 - 222 | 287 - 264 | 10 - 40 | | | 21 7 - 2156 | 118 - 147 | 240 - 247 | 20 - 38 | |
| 98/ 2/ 1 | 32 | 08 0 - 116 | 222 - 258 | 264 - 275 | 10 - 40 | | | | | | | |
| 98/ 2/ 1 | 32 | 1711 - 24 0 | 126 - 13 | 58 - 180 | 10 - 40 | | | 2811 - 2838 | 235 - 246 | 76 - 78 | 17 - 22 | |
| 98/ 2/ 2 | 33 | 08 0 - 111 | 13 - 56 | 188 - 118 | 10 - 40 | | | | | | | |
| 98/ 2/ 2 | 33 | 17 7 - 24 0 | 274 - 164 | 253 - 312 | 10 - 40 | | | | | | | |
| 98/ 2/ 3 | 34 | 08 0 - 1 7 | 164 - 284 | 312 - 321 | 10 - 40 | | | | | | | |
| 98/ 2/ 3 | 34 | 17 3 - 24 0 | 62 - 314 | 96 - 155 | 10 - 40 | | | 2138 - 24 0 | 228 - 314 | 135 - 155 | 14 - 23 | |
| 98/ 2/ 4 | 35 | 08 0 - 1 3 | 314 - 352 | 155 - 164 | 10 - 40 | | | | | | | |
| 98/ 2/ 4 | 35 | 1859 - 24 0 | 293 - 185 | 316 - 359 | 10 - 40 | | | | | | | |
| 98/ 2/ 5 | 36 | 08 0 - 159 | 195 - 140 | 359 - 7 | 10 - 40 | | | | | | | |
| 98/ 2/ 5 | 36 | 1655 - 24 0 | 350 - 255 | 142 - 282 | 10 - 40 | | | 23 7 - 24 0 | 223 - 255 | 195 - 282 | 16 - 26 | |
| 98/ 2/ 6 | 37 | 08 0 - 155 | 255 - 288 | 282 - 219 | 10 - 40 | | | 08 0 - 259 | 255 - 291 | 282 - 211 | 16 - 26 | |
| 98/ 2/ 8 | 39 | 1646 - 24 0 | 294 - 196 | 188 - 249 | 10 - 40 | | | | | | | |
| 98/ 2/ 8 | 39 | 1642 - 24 0 | 196 - 224 | 249 - 256 | 10 - 40 | | | | | | | |
| 98/ 2/ 9 | 40 | 08 0 - 842 | 62 - 347 | 31 - 93 | 10 - 40 | | | 1828 - 1854 | 146 - 162 | 46 - 50 | 20 - 28 | |
| 98/ 2/ 9 | 40 | 1638 - 24 0 | 230 - 137 | 234 - 296 | 10 - 40 | | | 2847 - 23 6 | 230 - 314 | 66 - 85 | 16 - 24 | |
| 98/ 2/10 | 41 | 08 0 - 838 | 137 - 169 | 296 - 382 | 10 - 40 | | | | | | | |
| 98/ 2/12 | 43 | 1634 - 24 0 | 319 - 229 | 124 - 187 | 10 - 40 | | | | | | | |
| 98/ 2/13 | 44 | 08 0 - 825 | 229 - 244 | 187 - 198 | 10 - 40 | | | | | | | |
| 98/ 2/13 | 44 | 1621 - 24 0 | 182 - 19 | 326 - 38 | 10 - 40 | | | 1958 - 2158 | 233 - 386 | 356 - 13 | 18 - 24 | |
| 98/ 2/14 | 45 | 08 0 - 821 | 19 - 32 | 38 - 33 | 10 - 40 | | | 1958 - 2158 | 233 - 386 | 356 - 13 | 18 - 24 | |
| 98/ 2/14 | 45 | 1626 - 24 0 | 127 - 52 | 261 - 328 | 10 - 40 | | | 2248 - 2349 | 122 - 163 | 223 - 232 | 14 - 28 | |
| 98/ 2/15 | 46 | 08 0 - 817 | 178 - 188 | 234 - 236 | 10 - 40 | | | 1935 - 1958 | 252 - 266 | 298 - 294 | 18 - 22 | |
| 98/ 2/15 | 46 | 1614 - 24 0 | 39 - 328 | 12 - 77 | 10 - 40 | | | 19 7 - 1928 | 143 - 156 | 36 - 39 | 21 - 22 | |
| 98/ 2/16 | 47 | 16 9 - 24 0 | 186 - 111 | 214 - 281 | 10 - 40 | | | 22 4 - 2354 | 250 - 317 | 61 - 77 | 16 - 26 | |
| 98/ 2/17 | 48 | 08 0 - 8 9 | 111 - 116 | 281 - 282 | 10 - 40 | | | | | | | |
| 98/ 2/17 | 48 | 16 9 - 24 0 | 337 - 261 | 58 - 124 | 10 - 40 | | | 1626 - 2853 | 196 - 358 | 217 - 254 | 18 - 32 | |
| 98/ 2/18 | 49 | 08 0 - 8 9 | 261 - 267 | 124 - 126 | 10 - 40 | | | | | | | |
| 98/ 2/18 | 49 | 16 9 - 24 0 | 127 - 52 | 261 - 328 | 10 - 40 | | | 08 0 - 80 | 82 - 261 | 82 - 124 | 12 - 36 | |
| 98/ 2/19 | 50 | 08 0 - 8 9 | 52 - 57 | 328 - 329 | 10 - 40 | | | 08 0 - 80 | 261 - 266 | 124 - 126 | 12 - 36 | |
| 98/ 2/19 | 50 | 1557 - 2357 | 270 - 291 | 183 - 171 | 10 - 40 | | | 1935 - 1958 | 252 - 266 | 298 - 294 | 18 - 22 | |
| 98/ 2/20 | 51 | 08 0 - 849 | 58 - 349 | 386 - 14 | 10 - 40 | | | 08 4 - 816 | 285 - 212 | 172 - 174 | 20 - 25 | |
| 98/ 2/21 | 52 | 1949 - 2349 | 352 - 137 | 183 - 217 | 10 - 40 | | | 2135 - 2328 | 265 - 329 | 354 - 9 | 16 - 24 | |
| 98/ 2/22 | 53 | 1545 - 2223 | 355 - 235 | 352 - 48 | 10 - 40 | | | | | | | |
| 98/ 2/23 | 54 | 1541 - 2341 | 143 - 73 | 195 - 263 | 10 - 40 | | | 08 3 - 2156 | 381 - 9 | | | |

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| DATE YY/MM/DD | DOY JJJ | TIME UT HHMM - HHMM | OBSERVATIONS | | | | TIME UT HHMM - HHMM | EMISSIONS | | | |
|------------------|------------|---------------------------|---------------------|-----------|---------|--------------|---------------------------|---------------------|---------|-------|--------------|
| | | | CML III (1965.8) | IO | PHASE | WIDTH MHZ | | CML III (1965.8) | IO | PHASE | WIDTH MHZ |
| 98/ 3/15 | 74 | 1425 - 2225 | 225 - 156 | 293 - 1 | 18 - 48 | 2147 - 2224 | 133 - 155 | 355 - 1 | 28 - 28 | | |
| 98/ 3/16 | 75 | 1424 - 2224 | 15 - 305 | 136 - 284 | 18 - 48 | | | | | | |
| 98/ 3/19 | 78 | 1438 - 2218 | 115 - 28 | 28 - 92 | 18 - 48 | | | | | | |
| 98/ 3/20 | 79 | 14 6 - 18 6 | 246 - 31 | 227 - 261 | 18 - 48 | | | | | | |
| 98/ 3/21 | 80 | 14 3 - 22 3 | 34 - 325 | 19 - 138 | 18 - 48 | 1518 - 18 8 | 88 - 182 | 81 - 185 | 28 - 37 | | |
| 98/ 3/22 | 81 | 14 6 - 22 8 | 187 - 113 | 274 - 341 | 18 - 48 | | | | | | |
| 98/ 3/23 | 82 | 14 8 - 2156 | 333 - 261 | 117 - 184 | 18 - 48 | | | | | | |
| 98/ 3/26 | 85 | 1346 - 2146 | 56 - 346 | 5 - 73 | 18 - 48 | | | | | | |
| 98/ 3/27 | 86 | 1342 - 2142 | 284 - 134 | 288 - 275 | 18 - 48 | 1428 - 1517 | 227 - 261 | 213 - 221 | 29 - 31 | | |
| 98/ 3/28 | 87 | 1345 - 2139 | 356 - 283 | 51 - 118 | 18 - 48 | 1629 - 1834 | 95 - 171 | 75 - 92 | 28 - 32 | | |
| | | | | | | 28 6 - 2138 | 226 - 282 | 185 - 118 | 18 - 26 | | |
| 98/ 3/29 | 88 | 1424 - 2135 | 178 - 71 | 268 - 321 | 18 - 48 | | | | | | |
| 98/ 3/30 | 89 | 1331 - 2131 | 288 - 218 | 96 - 164 | 18 - 48 | | | | | | |
| 98/ 3/31 | 90 | 1518 - 2138 | 139 - 8 | 314 - 7 | 18 - 48 | | | | | | |
| 98/ 4/ 2 | 92 | 1321 - 2121 | 13 - 383 | 345 - 53 | 18 - 48 | | | | | | |
| 98/ 4/ 3 | 93 | 1318 - 2118 | 162 - 92 | 188 - 256 | 18 - 48 | | | | | | |
| 98/ 4/ 4 | 94 | 1314 - 2115 | 318 - 241 | 31 - 99 | 18 - 48 | 1813 - 19 8 | 131 - 164 | 73 - 81 | 22 - 27 | | |
| 98/ 4/ 5 | 95 | 1556 - 2118 | 198 - 28 | 257 - 381 | 18 - 48 | | | | | | |
| 98/ 4/ 6 | 96 | 13 8 - 21 8 | 247 - 177 | 76 - 144 | 18 - 48 | | | | | | |
| 98/ 4/ 7 | 97 | 13 5 - 21 8 | 35 - 327 | 279 - 348 | 18 - 48 | | | | | | |
| 98/ 4/ 8 | 98 | 13 8 - 21 8 | 183 - 113 | 122 - 198 | 18 - 48 | | | | | | |
| 98/ 4/ 9 | 99 | 1257 - 2857 | 331 - 261 | 325 - 33 | 18 - 48 | | | | | | |
| 98/ 4/10 | 100 | 1328 - 2853 | 135 - 49 | 172 - 236 | 18 - 48 | | | | | | |
| 98/ 4/11 | 101 | 13 8 - 2838 | 274 - 186 | 12 - 76 | 18 - 48 | | | | | | |
| 98/ 4/12 | 102 | 1246 - 2846 | 56 - 346 | 213 - 281 | 18 - 48 | 1728 - 18 4 | 221 - 248 | 252 - 258 | 28 - 37 | | |
| 98/ 4/13 | 103 | 1243 - 2843 | 284 - 134 | 56 - 124 | 18 - 48 | 1516 - 1539 | 297 - 318 | 78 - 81 | 24 - 28 | | |
| | | | | | | 1958 - 2843 | 102 - 134 | 117 - 124 | 18 - 34 | | |
| 98/ 4/14 | 104 | 1239 - 2839 | 352 - 282 | 259 - 327 | 18 - 48 | | | | | | |
| 98/ 4/15 | 105 | 1248 - 2848 | 143 - 73 | 183 - 178 | 18 - 48 | | | | | | |
| 98/ 4/16 | 106 | 1248 - 2848 | 293 - 223 | 386 - 14 | 18 - 48 | | | | | | |
| 98/ 4/17 | 107 | 1235 - 2831 | 81 - 8 | 149 - 216 | 18 - 48 | 1558 - 18 8 | 283 - 277 | 177 - 194 | 26 - 28 | | |
| 98/ 4/18 | 108 | 1227 - 2827 | 226 - 156 | 351 - 59 | 18 - 48 | | | | | | |
| 98/ 4/19 | 109 | 1224 - 2824 | 15 - 385 | 194 - 261 | 18 - 48 | 1711 - 1858 | 188 - 253 | 234 - 249 | 28 - 34 | | |
| 98/ 4/20 | 110 | 1221 - 2821 | 163 - 93 | 37 - 184 | 18 - 48 | | | | | | |
| 98/ 4/21 | 111 | 1217 - 2817 | 311 - 241 | 239 - 387 | 18 - 48 | | | | | | |
| 98/ 4/22 | 112 | 1213 - 2813 | 99 - 29 | 82 - 158 | 18 - 48 | 1221 - 1438 | 184 - 182 | 83 - 181 | 24 - 33 | | |
| 98/ 4/23 | 113 | 1211 - 2811 | 248 - 178 | 285 - 353 | 18 - 48 | | | | | | |
| 98/ 4/24 | 114 | 12 7 - 28 7 | 36 - 326 | 128 - 196 | 18 - 48 | 1745 - 18 3 | 248 - 251 | 176 - 178 | 24 - 18 | | |
| 98/ 4/25 | 115 | 12 4 - 28 4 | 184 - 114 | 331 - 39 | 18 - 48 | | | | | | |
| 98/ 4/26 | 116 | 12 8 - 28 1 | 337 - 263 | 175 - 241 | 18 - 48 | 13 1 - 1357 | 9 - 43 | 182 - 198 | 29 - 35 | | |
| 98/ 4/27 | 117 | 1157 - 1958 | 121 - 51 | 15 - 84 | 18 - 48 | | | | | | |
| 98/ 4/28 | 118 | 1153 - 1958 | 269 - 281 | 219 - 287 | 18 - 48 | | | | | | |
| 98/ 4/29 | 119 | 1148 - 1958 | 286 - 142 | 265 - 334 | 18 - 48 | 1242 - 1333 | 239 - 278 | 273 - 288 | 24 - 27 | | |
| 98/ 5/ 1 | 121 | 1148 - 1948 | 356 - 287 | 188 - 176 | 18 - 48 | | | | | | |
| 98/ 5/ 2 | 122 | 1148 - 1942 | 147 - 73 | 312 - 19 | 18 - 48 | | | | | | |
| 98/ 5/ 3 | 123 | 1138 - 1942 | 291 - 79 | 154 - 180 | 18 - 48 | | | | | | |
| 98/ 5/ 4 | 124 | 1135 - 1935 | 88 - 18 | 356 - 64 | 18 - 48 | 1618 - 1625 | 251 - 255 | 36 - 37 | 22 - 27 | | |
| 98/ 5/ 5 | 125 | 1132 - 1938 | 228 - 157 | 199 - 267 | 18 - 48 | | | | | | |
| 98/ 5/ 6 | 126 | 1128 - 1755 | 16 - 258 | 42 - 97 | 18 - 48 | | | | | | |
| 98/ 5/ 7 | 127 | 1125 - 1923 | 164 - 93 | 245 - 312 | 18 - 48 | | | | | | |
| 98/ 5/ 9 | 129 | 1128 - 1246 | 182 - 154 | 291 - 383 | 18 - 48 | | | | | | |
| 98/ 5/10 | 130 | 1116 - 1916 | 258 - 188 | 134 - 281 | 18 - 48 | | | | | | |
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| 98/ 5/15 | 135 | 11 7 - 19 7 | 276 - 286 | 69 - 136 | 18 - 48 | | | | | | |
| 98/ 5/16 | 136 | 1222 - 1857 | 111 - 350 | 283 - 338 | 18 - 48 | | | | | | |
| 98/ 5/17 | 137 | 1053 - 1854 | 298 - 139 | 113 - 181 | 18 - 48 | | | | | | |
| 98/ 5/18 | 138 | 1051 - 1851 | 357 - 287 | 316 - 24 | 18 - 48 | | | | | | |
| 98/ 5/19 | 139 | 1048 - 1848 | 145 - 76 | 159 - 227 | 18 - 48 | | | | | | |
| 98/ 5/21 | 141 | 1042 - 1842 | 82 - 13 | 285 - 273 | 18 - 48 | | | | | | |
| 98/ 5/22 | 142 | 1043 - 1838 | 233 - 168 | 48 - 115 | 18 - 48 | 14 8 - 1558 | 287 - 269 | 234 - 248 | 28 - 32 | | |
| 98/ 5/23 | 143 | 1035 - 1835 | 19 - 389 | 258 - 318 | 18 - 48 | | | | | | |
| 98/ 5/24 | 144 | 1032 - 1832 | 167 - 97 | 93 - 161 | 18 - 48 | | | | | | |
| 98/ 5/25 | 145 | 1029 - 1829 | 316 - 246 | 296 - 4 | 18 - 48 | | | | | | |
| 98/ 5/26 | 146 | 1026 - 1826 | 164 - 34 | 139 - 287 | 18 - 48 | | | | | | |
| 98/ 5/27 | 147 | 1023 - 1823 | 253 - 183 | 342 - 58 | 18 - 48 | | | | | | |
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| 98/ 5/30 | 150 | 1015 - 1817 | 339 - 270 | 231 - 299 | 18 - 48 | | | | | | |
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| 98/ 6/ 5 | 156 | 956 - 1756 | 149 - 79 | 8 - 75 | 18 - 48 | | | | | | |
| 98/ 6/ 6 | 157 | 953 - 1753 | 297 - 227 | 218 - 278 | 18 - 48 | | | | | | |
| 98/ 6/ 7 | 158 | 958 - 1758 | 86 - 16 | 53 - 121 | 18 - 48 | | | | | | |
| 98/ 6/ 8 | 159 | 947 - 1747 | 234 - 164 | 256 - 324 | 18 - 48 | | | | | | |
| 98/ 6/ 9 | 160 | 943 - 1743 | 22 - 212 | 99 - 167 | 18 - 48 | | | | | | |
| 98/ 6/10 | 161 | 939 - 1739 | 178 - 108 | 381 - 9 | 18 - 48 | | | | | | |
| 98/ 6/11 | 162 | 938 - 1738 | 328 - 258 | 145 - 212 | 18 - 48 | | | | | | |
| 98/ 6/12 | 163 | 935 - 1735 | 188 - 38 | 347 - 55 | 18 - 48 | 1245 - 13 2 | 223 - 233 | 14 - 17 | 26 - 38 | | |
| | | | | | | 1334 - 1347 | 253 - 261 | 21 - 23 | 28 - 26 | | |
| 98/ 6/13 | 164 | 932 - 1732 | 257 - 187 | 198 - 258 | 18 - 48 | | | | | | |
| 98/ 6/14 | 165 | 929 - 1729 | 45 - 335 | 33 - 181 | 18 - 48 | 1431 - 15 5 | 228 - 248 | 76 - 81 | 22 - 28 | | |
| 98/ 6/15 | 166 | 1614 - 1726 | 223 - 124 | 243 - 384 | 18 - 48 | 934 - 1142 | 199 - 276 | 237 - 255 | 22 - 38 | | |
| 98/ 6/16 | 167 | 922 - 1722 | 343 - 272 | 29 - 146 | 18 - 48 | | | | | | |
| 98/ 6/17 | 168 | 918 - 1718 | 129 - 68 | 281 - 349 | 18 - 48 | | | | | | |
| 98/ 6/18 | 169 | 917 - 1717 | 279 - 289 | 125 - 192 | 18 - 48 | | | | | | |
| 98/ 6/19 | 170 | 916 - 1714 | 69 - 358 | 328 - 35 | 18 - 48 | | | | | | |
| 98/ 6/20 | 171 | 911 - 1711 | 216 - 146 | 178 - 238 | 18 - 48 | | | | | | |
| 98/ 6/21 | 172 | 915 - 17 8 | 9 - 295 | 14 - 81 | 18 - 48 | | | | | | |
| 98/ 6/22 | 173 | 9 5 - 17 5 | 153 - 83 | 216 - 284 | 18 - 48 | 1826 - 1149 | 282 - 252 | 227 - 239 | 24 - 34 | | |
| | | | | | | 1322 - 1348 | 308 - 319 | 252 - 255 | 23 - 27 | | |
| 98/ 6/23 | 174 | 9 1 - 1113 | 381 - 24 | 59 - 78 | 18 - 48 | | | | | | |
| 98/ 6/24 | 175 | 857 - 1657 | 89 - 19 | 261 - 329 | 18 - 48 | | | | | | |
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|------------------|------------|------------------------|---------------------|-----------|---------|--------------|------------------------|---------------------|---------|-------|--------------|
| | | | CHL III (1965.0) | IO | PHASE | | | CHL III (1965.0) | IO | PHASE | |
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| 98/7/13 | 194 | 9 2 - 16 2 | 67 - 321 | 164 - 223 | 18 - 48 | | | | | | |
| 98/7/14 | 195 | 758 - 1558 | 179 - 189 | 358 - 66 | 18 - 48 | | | | | | |
| 98/7/15 | 196 | 754 - 1554 | 327 - 257 | 281 - 269 | 18 - 48 | | | | | | |
| 98/7/16 | 197 | 8 7 - 1553 | 125 - 47 | 46 - 112 | 18 - 48 | | | | | | |
| 98/7/17 | 198 | 758 - 1558 | 265 - 195 | 247 - 315 | 18 - 48 | | | | | | |
| 98/7/18 | 199 | 748 - 1548 | 54 - 344 | 98 - 158 | 18 - 48 | 1457 - 15 3 | 314 - 317 | 158 - 151 | 38 - 34 | | |
| 98/7/19 | 200 | 749 - 1545 | 285 - 133 | 293 - 8 | 18 - 48 | | | | | | |
| 98/7/20 | 201 | 749 - 1542 | 356 - 281 | 137 - 283 | 18 - 48 | | | | | | |
| 98/7/21 | 202 | 737 - 1537 | 139 - 69 | 338 - 46 | 18 - 48 | | | | | | |
| 98/7/22 | 203 | 733 - 1533 | 286 - 217 | 181 - 249 | 18 - 48 | | | | | | |
| 98/7/23 | 211 | 8 9 - 13 8 | 71 - 247 | 12 - 53 | 18 - 48 | | | | | | |
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| 98/8/ 4 | 216 | 755 - 1455 | 94 - 348 | 306 - 6 | 18 - 48 | 12 3 - 1224 | 244 - 257 | 341 - 344 | 23 - 28 | | |
| 98/8/ 5 | 217 | 751 - 1451 | 242 - 136 | 149 - 288 | 18 - 48 | 8 8 - 838 | 247 - 266 | 158 - 165 | 28 - 25 | | |
| 98/8/ 6 | 218 | 751 - 1558 | 32 - 322 | 352 - 68 | 18 - 48 | | | | | | |
| 98/8/ 7 | 219 | 835 - 1447 | 289 - 74 | 282 - 254 | 18 - 48 | 9 8 - 958 | 224 - 255 | 285 - 212 | 28 - 38 | | |
| 98/8/ 8 | 220 | 734 - 1444 | 323 - 223 | 37 - 97 | 18 - 48 | | | | | | |
| 98/8/ 9 | 221 | 713 - 1448 | 188 - 18 | 237 - 388 | 18 - 48 | | | | | | |
| 98/8/10 | 222 | 718 - 1439 | 249 - 168 | 88 - 143 | 18 - 48 | | | | | | |
| 98/8/12 | 224 | 631 - 1431 | 166 - 96 | 121 - 189 | 18 - 48 | | | | | | |
| 98/8/13 | 225 | 914 - 1438 | 55 - 246 | 347 - 32 | 18 - 48 | | | | | | |
| 98/8/14 | 226 | 627 - 1426 | 184 - 34 | 167 - 234 | 18 - 48 | | | | | | |
| 98/8/15 | 227 | 624 - 1425 | 253 - 184 | 18 - 78 | 18 - 48 | | | | | | |
| 98/8/16 | 228 | 619 - 1419 | 48 - 338 | 212 - 288 | 18 - 48 | 1847 - 1143 | 282 - 236 | 258 - 258 | 23 - 34 | | |
| 98/8/17 | 229 | 617 - 1417 | 189 - 119 | 55 - 123 | 18 - 48 | | | | | | |
| 98/8/18 | 230 | 614 - 1414 | 338 - 268 | 258 - 326 | 18 - 48 | | | | | | |
| 98/8/19 | 231 | 618 - 1418 | 128 - 56 | 181 - 169 | 18 - 48 | | | | | | |
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| 98/8/21 | 233 | 6 5 - 14 5 | 63 - 354 | 147 - 214 | 18 - 48 | 958 - 1025 | 284 - 221 | 108 - 183 | 24 - 29 | | |
| 98/8/22 | 234 | 6 2 - 14 2 | 212 - 142 | 358 - 57 | 18 - 48 | 654 - 727 | 243 - 263 | 357 - 2 | 18 - 24 | | |
| 98/8/23 | 235 | 559 - 1359 | 1 - 291 | 192 - 268 | 18 - 48 | 1117 - 1142 | 193 - 288 | 237 - 241 | 23 - 27 | | |
| 98/8/24 | 236 | 956 - 1356 | 294 - 79 | 69 - 103 | 18 - 48 | | | | | | |
| 98/8/25 | 237 | 553 - 1353 | 298 - 228 | 238 - 306 | 18 - 48 | | | | | | |
| 98/8/26 | 238 | 549 - 1349 | 86 - 16 | 81 - 149 | 18 - 48 | 6 4 - 852 | 95 - 196 | 83 - 187 | 18 - 34 | | |
| 98/8/27 | 239 | 545 - 1345 | 234 - 164 | 284 - 251 | 18 - 48 | 1848 - 1135 | 282 - 235 | 169 - 176 | 24 - 28 | | |
| 98/8/28 | 240 | 544 - 1344 | 23 - 313 | 127 - 194 | 18 - 48 | | | | | | |
| 98/8/29 | 241 | 548 - 1348 | 171 - 181 | 329 - 37 | 18 - 48 | 13 8 - 1335 | 228 - 249 | 235 - 248 | 28 - 34 | | |
| 98/8/30 | 242 | 537 - 1337 | 328 - 258 | 172 - 248 | 18 - 48 | | | | | | |
| 98/9/ 1 | 243 | 534 - 1334 | 188 - 39 | 15 - 83 | 18 - 48 | | | | | | |
| 98/9/ 3 | 246 | 931 - 1331 | 343 - 128 | 299 - 332 | 18 - 48 | | | | | | |
| 98/9/ 4 | 247 | 522 - 1322 | 343 - 273 | 187 - 174 | 18 - 48 | | | | | | |
| 98/9/ 5 | 248 | 519 - 1319 | 131 - 61 | 318 - 17 | 18 - 48 | | | | | | |
| 98/9/ 6 | 249 | 516 - 1316 | 208 - 218 | 152 - 228 | 18 - 48 | | | | | | |
| 98/9/ 7 | 250 | 513 - 1313 | 68 - 359 | 355 - 63 | 18 - 48 | | | | | | |
| 98/9/ 8 | 251 | 5 9 - 13 9 | 216 - 146 | 198 - 266 | 18 - 48 | 511 - 546 | 218 - 239 | 198 - 283 | 23 - 27 | | |
| 98/9/ 9 | 252 | 5 5 - 13 5 | 294 - 1 | 41 - 109 | 18 - 48 | | | | | | |
| 98/9/10 | 253 | 152 - 132 | 152 - 82 | 244 - 311 | 18 - 48 | | | | | | |
| 98/9/11 | 254 | 459 - 1259 | 301 - 232 | 87 - 154 | 18 - 48 | | | | | | |
| 98/9/12 | 255 | 456 - 1256 | 98 - 28 | 289 - 357 | 18 - 48 | | | | | | |
| 98/9/13 | 256 | 453 - 1253 | 239 - 169 | 132 - 288 | 18 - 48 | | | | | | |
| 98/9/14 | 257 | 458 - 1258 | 27 - 317 | 335 - 43 | 18 - 48 | | | | | | |
| 98/9/15 | 258 | 447 - 1247 | 176 - 186 | 178 - 246 | 18 - 48 | | | | | | |
| 98/9/17 | 268 | 439 - 1239 | 112 - 42 | 224 - 291 | 18 - 48 | | | | | | |
| 98/9/18 | 269 | 438 - 1238 | 262 - 192 | 67 - 135 | 18 - 48 | | | | | | |
| 98/9/19 | 270 | 435 - 1235 | 58 - 348 | 278 - 338 | 18 - 48 | | | | | | |
| 98/9/20 | 271 | 431 - 1231 | 198 - 128 | 113 - 188 | 18 - 48 | | | | | | |
| 98/9/21 | 274 | 852 - 1228 | 146 - 277 | 353 - 23 | 18 - 48 | 1857 - 1149 | 222 - 253 | 18 - 18 | 25 - 28 | | |
| 98/9/22 | 265 | 425 - 1225 | 135 - 66 | 158 - 226 | 18 - 48 | 6 8 - 752 | 198 - 261 | 173 - 188 | 17 - 28 | | |
| 98/9/23 | 266 | 421 - 1221 | 283 - 214 | 1 1 - 69 | 18 - 48 | | | | | | |
| 98/9/24 | 267 | 417 - 1217 | 71 - 2 | 284 - 272 | 18 - 48 | 727 - 936 | 186 - 264 | 231 - 249 | 18 - 36 | | |
| 98/9/25 | 268 | 415 - 1215 | 221 - 151 | 47 - 115 | 18 - 48 | 456 - 548 | 245 - 272 | 53 - 59 | 18 - 22 | | |
| 98/9/26 | 269 | 412 - 1212 | 9 - 299 | 258 - 318 | 18 - 48 | 412 - 424 | 9 - 17 | 258 - 251 | 16 - 21 | | |
| 98/9/27 | 270 | 4 9 - 12 9 | 158 - 88 | 93 - 168 | 18 - 48 | 4 9 - 443 | 158 - 178 | 93 - 98 | 22 - 32 | | |
| 98/9/28 | 271 | 4 6 - 12 6 | 387 - 237 | 296 - 3 | 18 - 48 | | | | | | |
| 98/9/29 | 272 | 4 2 - 12 6 | 95 - 27 | 138 - 287 | 18 - 48 | | | | | | |
| 98/9/30 | 273 | 358 - 1158 | 243 - 173 | 341 - 49 | 18 - 48 | | | | | | |
| 98/10/ 1 | 274 | 354 - 1154 | 31 - 321 | 184 - 252 | 18 - 48 | | | | | | |
| 98/10/ 2 | 275 | 352 - 1152 | 108 - 118 | 27 - 95 | 18 - 48 | | | | | | |
| 98/10/ 3 | 276 | 349 - 1028 | 328 - 285 | 238 - 285 | 18 - 48 | | | | | | |
| 98/10/ 4 | 277 | 346 - 1146 | 117 - 47 | 73 - 141 | 18 - 48 | 418 - 618 | 132 - 284 | 76 - 93 | 18 - 28 | | |
| 98/10/ 5 | 278 | 342 - 1143 | 265 - 196 | 276 - 344 | 18 - 48 | 418 - 431 | 287 - 295 | 281 - 283 | 18 - 22 | | |
| 98/10/ 6 | 279 | 339 - 1139 | 54 - 344 | 119 - 186 | 18 - 48 | 4 6 - 5 5 | 78 - 186 | 122 - 131 | 18 - 23 | | |
| 98/10/ 7 | 280 | 335 - 1135 | 282 - 132 | 321 - 29 | 18 - 48 | 4 8 - 516 | 222 - 263 | 326 - 336 | 17 - 25 | | |
| 98/10/ 8 | 281 | 331 - 1131 | 358 - 288 | 164 - 232 | 18 - 48 | | | | | | |
| 98/10/ 9 | 282 | 329 - 1129 | 139 - 69 | 7 - 75 | 18 - 48 | | | | | | |
| 98/10/10 | 283 | 326 - 1126 | 288 - 218 | 218 - 278 | 18 - 48 | 354 - 5 7 | 385 - 349 | 214 - 224 | 16 - 24 | | |
| 98/10/11 | 284 | 323 - 1123 | 76 - 7 | 53 - 121 | 18 - 48 | 323 - 551 | 76 - 166 | 53 - 74 | 16 - 28 | | |
| 98/10/12 | 285 | 319 - 1119 | 224 - 155 | 256 - 324 | 18 - 48 | 319 - 553 | 224 - 318 | 256 - 278 | 15 - 28 | | |
| 98/10/13 | 286 | 316 - 1116 | 13 - 383 | 99 - 167 | 18 - 48 | | | | | | |
| 98/10/14 | 287 | 312 - 1112 | 161 - 91 | 382 - 9 | 18 - 48 | | | | | | |
| 98/10/15 | 288 | 3 8 - 11 8 | 389 - 239 | 144 - 212 | 18 - 48 | | | | | | |
| 98/10/16 | 289 | 3 5 - 11 5 | 98 - 28 | 347 - 55 | 18 - 48 | | | | | | |
| 98/10/17 | 290 | 3 2 - 11 2 | 247 - 177 | 198 - 258 | 18 - 48 | | | | | | |
| 98/10/18 | 291 | 258 - 1058 | 35 - 325 | 33 - 181 | 18 - 48 | | | | | | |
| 98/10/19 | 292 | 255 - 1055 | 183 - 113 | 236 - 384 | 18 - 48 | 3 2 - 526 | 188 - 275 | 237 - 257 | 16 - 36 | | |
| 98/10/20 | 293 | 252 - 1052 | 332 - 262 | 79 - 147 | 18 - 48 | 432 - 515 | 32 - 58 | 93 - 99 | 14 - 18 | | |
| 98/10/21 | 294 | 248 - 1048 | 128 - 58 | 282 - 358 | 18 - 48 | | | | | | |
| 98/10/22 | 295 | 244 - 1044 | 268 - 198 | 125 - 193 | 18 - 48 | 438 - 458 | 337 - 349 | 141 - 144 | 12 - 17 | | |
| 98/10/23 | 296 | 241 - 1041 | 57 - 347 | 328 - 36 | 18 - 48 | 238 - 545 | 286 - 319 | 171 - 197 | 14 - 28 | | |
| 98/10/24 | 297 | 238 - 1038 | 296 - 136 | 171 - 239 | 18 - 48 | 428 - 519 | 63 - 93 | 38 - 37 | 18 - 26 | | |
| 98/10/25 | 298 | 234 - 1034 | 354 - 284 | 14 - 81 | 18 - 48 | 445 - 6 7 | 223 - 273 | 235 - 247 | 15 - 36 | | |

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| DATE YY/MM/DD | DOY JJJ | TIME UT HHMM - HHMM | OBSERVATIONS | | | WIDTH MHZ | TIME UT HHMM - HHMM | EMISSIONS | | | WIDTH MHZ |
|------------------|------------|------------------------|---------------------|-----------|---------|--------------|------------------------|---------------------|---------|-------|--------------|
| | | | CML III (1965.8) | IO | PHASE | | | CML III (1965.8) | IO | PHASE | |
| 98/11/15 | 319 | 118 - 918 | 229 - 159 | 315 - 23 | 18 - 48 | 123 - 323 | 232 - 384 | 315 - 332 | 15 - 25 | | |
| 98/11/16 | 320 | 115 - 915 | 18 - 388 | 158 - 226 | 18 - 48 | 325 - 548 | 96 - 178 | 176 - 195 | 14 - 28 | | |
| 98/11/17 | 321 | 111 - 911 | 166 - 96 | 1 - 69 | 18 - 48 | 243 - 537 | 221 - 327 | 14 - 38 | 14 - 28 | | |
| 98/11/18 | 322 | 117 - 97 | 328 - 244 | 285 - 271 | 18 - 48 | 428 - 62 | 75 - 132 | 232 - 245 | 13 - 28 | | |
| 98/11/19 | 323 | 13 - 93 | 182 - 32 | 46 - 114 | 18 - 48 | 428 - 658 | 221 - 276 | 74 - 87 | 13 - 25 | | |
| 98/11/20 | 324 | 18 - 98 | 251 - 181 | 258 - 317 | 18 - 48 | 859 - 23 | 258 - 289 | 249 - 258 | 12 - 26 | | |
| 98/11/21 | 325 | 22 - 95 | 252 - 252 | 187 - 117 | 18 - 48 | 255 - 43 | 328 - 1 | 266 - 275 | 16 - 23 | | |
| 98/11/22 | 326 | 852 - 852 | 187 - 117 | 295 - 3 | 18 - 48 | 155 - 68 | 285 - 13 | 384 - 339 | 14 - 26 | | |
| 98/11/23 | 327 | 848 - 848 | 335 - 266 | 138 - 286 | 18 - 48 | 848 - 221 | 335 - 32 | 138 - 151 | 14 - 19 | | |
| | | | | | | 411 - 515 | 98 - 137 | 167 - 176 | 14 - 26 | | |
| | | | | | | 651 - 715 | 98 - 217 | 198 - 195 | 21 - 27 | | |
| 98/11/24 | 328 | 844 - 844 | 123 - 54 | 341 - 49 | 18 - 48 | 111 - 135 | 140 - 154 | 345 - 348 | 14 - 21 | | |
| 98/11/25 | 329 | 848 - 848 | 272 - 282 | 184 - 252 | 18 - 48 | 325 - 559 | 221 - 314 | 4 - 28 | 13 - 38 | | |
| 98/11/26 | 330 | 836 - 848 | 68 - 352 | 27 - 95 | 18 - 48 | 135 - 425 | 385 - 48 | 192 - 216 | 14 - 21 | | |
| 98/11/27 | 331 | 88 - 831 | 189 - 138 | 225 - 298 | 18 - 48 | 548 - 614 | 248 - 284 | 71 - 78 | 16 - 23 | | |
| 98/11/28 | 332 | 828 - 828 | 356 - 286 | 73 - 141 | 18 - 48 | 425 - 435 | 198 - 248 | 59 - 61 | 15 - 17 | | |
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| 98/11/38 | 334 | 821 - 85 | 293 - 214 | 119 - 184 | 18 - 48 | 240 - 240 | 629 - 17 | 139 - 171 | 12 - 28 | | |
| 98/12/1 | 335 | 817 - 817 | 81 - 12 | 322 - 39 | 18 - 48 | 848 - 21 | 335 - 95 | 325 - 341 | 14 - 24 | | |
| 98/12/1 | 335 | 812 - 817 | 78 - 12 | 321 - 38 | 18 - 48 | 334 - 334 | 524 - 267 | 358 - 358 | 13 - 24 | | |
| 98/12/2 | 336 | 813 - 813 | 238 - 168 | 165 - 233 | 18 - 48 | 819 - 846 | 233 - 249 | 166 - 169 | 17 - 26 | | |
| | | | | | | 213 - 522 | 382 - 56 | 182 - 208 | 13 - 19 | | |
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| 98/12/3 | 337 | 89 - 89 | 18 - 388 | 8 - 76 | 18 - 48 | 822 - 648 | 327 - 195 | 57 - 118 | 12 - 37 | | |
| 98/12/5 | 339 | 81 - 81 | 314 - 244 | 54 - 121 | 18 - 48 | | | | | | |
| 98/12/5 | 339 | 2357 - 24 | 182 - 184 | 257 - 257 | 18 - 48 | 2 - 5 | 637 - 338 | 135 - 118 | 14 - 28 | | |
| 98/12/6 | 340 | 88 - 757 | 184 - 33 | 257 - 324 | 18 - 48 | 128 - 428 | 153 - 261 | 268 - 294 | 12 - 29 | | |
| 98/12/6 | 340 | 2357 - 24 | 253 - 255 | 188 - 181 | 18 - 48 | 518 - 628 | 292 - 334 | 381 - 311 | 28 - 24 | | |
| 98/12/7 | 341 | 88 - 753 | 255 - 181 | 181 - 167 | 18 - 48 | | | | | | |
| 98/12/7 | 341 | 2349 - 24 | 39 - 45 | 383 - 384 | 18 - 48 | 124 - 256 | 96 - 152 | 316 - 329 | 16 - 26 | | |
| 98/12/8 | 342 | 88 - 749 | 45 - 329 | 384 - 18 | 18 - 48 | 443 - 638 | 216 - 281 | 344 - 359 | 12 - 26 | | |
| 98/12/8 | 342 | 2345 - 24 | 107 - 196 | 145 - 148 | 18 - 48 | | | | | | |
| 98/12/9 | 343 | 88 - 745 | 196 - 117 | 148 - 213 | 18 - 48 | 813 - 432 | 284 - 8 | 149 - 186 | 12 - 27 | | |
| 98/12/9 | 343 | 2341 - 24 | 335 - 347 | 348 - 351 | 18 - 48 | | | | | | |
| 98/12/10 | 344 | 88 - 741 | 347 - 265 | 351 - 56 | 18 - 48 | | | | | | |
| 98/12/10 | 344 | 2337 - 24 | 123 - 137 | 191 - 195 | 18 - 48 | | | | | | |
| 98/12/11 | 345 | 88 - 737 | 137 - 54 | 195 - 259 | 18 - 48 | 128 - 628 | 186 - 7 | 286 - 248 | 12 - 36 | | |
| 98/12/11 | 345 | 2333 - 24 | 272 - 208 | 34 - 38 | 18 - 48 | | | | | | |
| 98/12/12 | 346 | 88 - 733 | 288 - 282 | 38 - 182 | 18 - 48 | 812 - 74 | 295 - 184 | 48 - 98 | 12 - 34 | | |
| 98/12/12 | 346 | 2329 - 24 | 68 - 79 | 237 - 242 | 18 - 48 | | | | | | |
| 98/12/13 | 347 | 88 - 729 | 79 - 358 | 242 - 385 | 18 - 48 | 432 - 453 | 243 - 256 | 288 - 283 | 16 - 28 | | |
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| 98/12/13 | 347 | 2325 - 24 | 288 - 229 | 88 - 85 | 18 - 48 | | | | | | |
| 98/12/14 | 348 | 88 - 725 | 229 - 138 | 85 - 148 | 18 - 48 | 824 - 145 | 244 - 293 | 89 - 188 | 14 - 26 | | |
| 98/12/14 | 348 | 2328 - 24 | 356 - 28 | 283 - 289 | 18 - 48 | | | | | | |
| 98/12/15 | 349 | 88 - 728 | 28 - 286 | 289 - 351 | 18 - 48 | 228 - 357 | 184 - 163 | 389 - 322 | 12 - 28 | | |
| | | | | | | 52 - 632 | 282 - 257 | 332 - 344 | 12 - 25 | | |
| 98/12/17 | 351 | 23 8 - 24 | 88 - 112 | 172 - 188 | 18 - 48 | | | | | | |
| 98/12/18 | 352 | 88 - 78 | 112 - 11 | 188 - 248 | 18 - 48 | 2 1 - 547 | 185 - 322 | 197 - 229 | 13 - 33 | | |
| 98/12/18 | 352 | 23 4 - 24 | 229 - 262 | 15 - 23 | 18 - 48 | 2238 - 24 | 213 - 262 | 11 - 23 | 12 - 31 | | |
| 98/12/19 | 353 | 88 - 74 | 262 - 159 | 23 - 83 | 18 - 48 | 88 - 634 | 262 - 141 | 23 - 79 | 12 - 31 | | |
| 98/12/19 | 353 | 23 8 - 24 | 17 - 53 | 218 - 227 | 18 - 48 | | | | | | |
| 98/12/20 | 354 | 88 - 78 | 53 - 387 | 227 - 286 | 18 - 48 | 128 - 254 | 181 - 158 | 238 - 251 | 16 - 24 | | |
| 98/12/20 | 354 | 2255 - 24 | 164 - 284 | 61 - 78 | 18 - 48 | | | | | | |
| 98/12/21 | 355 | 88 - 655 | 284 - 95 | 78 - 129 | 18 - 48 | 829 - 341 | 221 - 337 | 74 - 181 | 13 - 25 | | |
| | | | | | | 4 6 - 636 | 352 - 47 | 185 - 118 | 15 - 17 | | |
| 98/12/21 | 355 | 2251 - 24 | 313 - 354 | 264 - 274 | 18 - 48 | | | | | | |
| 98/12/22 | 356 | 88 - 651 | 354 - 243 | 274 - 332 | 18 - 48 | 128 - 325 | 43 - 118 | 285 - 383 | 14 - 28 | | |
| 98/12/22 | 356 | 2247 - 24 | 181 - 145 | 187 - 117 | 18 - 48 | | | | | | |
| 98/12/23 | 357 | 88 - 647 | 145 - 31 | 117 - 175 | 18 - 48 | 145 - 342 | 289 - 279 | 132 - 149 | 14 - 24 | | |
| 98/12/23 | 357 | 2243 - 24 | 249 - 296 | 318 - 321 | 18 - 48 | | | | | | |
| 98/12/24 | 358 | 88 - 643 | 296 - 179 | 321 - 18 | 18 - 48 | | | | | | |
| 98/12/24 | 358 | 2238 - 24 | 37 - 85 | 153 - 164 | 18 - 48 | | | | | | |
| 98/12/25 | 359 | 88 - 638 | 86 - 327 | 164 - 221 | 18 - 48 | 148 - 229 | 152 - 176 | 188 - 186 | 13 - 22 | | |
| 98/12/25 | 359 | 2234 - 24 | 185 - 237 | 356 - 8 | 18 - 48 | | | | | | |
| 98/12/26 | 360 | 88 - 634 | 237 - 115 | 8 - 64 | 18 - 48 | #36 - 252 | 259 - 341 | 13 - 32 | 15 - 19 | | |
| 98/12/26 | 360 | 2238 - 24 | 333 - 28 | 199 - 212 | 18 - 48 | | | | | | |
| 98/12/27 | 361 | 88 - 638 | 28 - 264 | 212 - 267 | 18 - 48 | 128 - 246 | 76 - 128 | 223 - 235 | 13 - 17 | | |
| | | | | | | 315 - 553 | 146 - 241 | 239 - 262 | 13 - 29 | | |
| | | | | | | 2227 - 2356 | 122 - 176 | 42 - 55 | 16 - 23 | | |
| 98/12/27 | 361 | 2226 - 24 | 122 - 178 | 42 - 55 | 18 - 48 | | | | | | |
| 98/12/28 | 362 | 88 - 626 | 178 - 52 | 55 - 110 | 18 - 48 | 114 - 453 | 223 - 356 | 66 - 97 | 14 - 22 | | |
| 98/12/28 | 362 | 2222 - 24 | 278 - 329 | 245 - 259 | 18 - 48 | 2217 - 24 | 267 - 329 | 244 - 259 | 14 - 19 | | |
| 98/12/29 | 363 | 88 - 622 | 329 - 288 | 259 - 313 | 18 - 48 | 88 - 238 | 329 - 68 | 259 - 288 | 14 - 19 | | |
| | | | | | | 328 - 538 | 95 - 169 | 288 - 385 | 16 - 26 | | |
| 98/12/29 | 363 | 2218 - 24 | 58 - 128 | 88 - 182 | 18 - 48 | 2254 - 24 | 88 - 128 | 93 - 182 | 14 - 34 | | |
| 98/12/30 | 364 | 88 - 618 | 128 - 348 | 182 - 156 | 18 - 48 | | | | | | |
| 98/12/30 | 364 | 2214 - 24 | 286 - 278 | 291 - 306 | 18 - 48 | 2322 - 24 | 247 - 278 | 381 - 386 | 15 - 23 | | |
| 98/12/31 | 365 | 88 - 614 | 278 - 137 | 386 - 359 | 18 - 48 | 88 - 23 | 278 - 345 | 386 - 323 | 15 - 23 | | |
| | | | | | | 88 - 8 | 242 - 242 | 241 - 241 | 8 - 8 | | |