MARS GLOBAL SURVEYOR

LAUNCH

TERMINAL PHASE COUNTDOWN

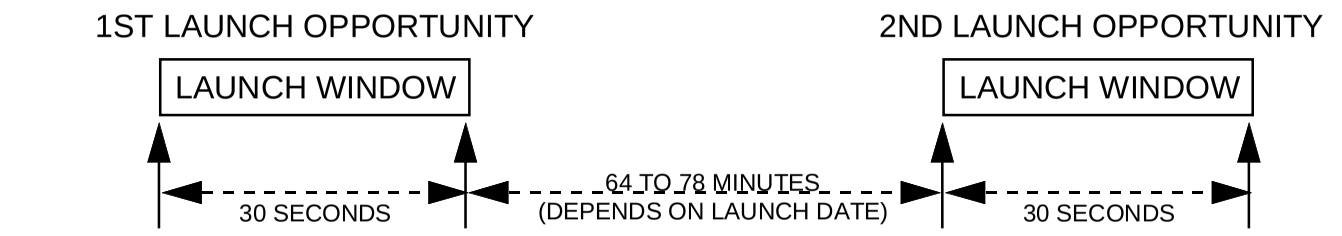
M. D. JOHNSTON

LAUNCH PERIOD

- LAUNCH PERIOD: NOV 6 THROUGH NOV 25, 1996
  - NOV 6 THROUGH NOV 15, 1996
    - TWO OPPORTUNITIES PER DAY
      - BOTH SHORT COAST
      - SATISFIES LAUNCH OPERATIONS CONSTRAINTS
    - LAUNCH AZIMUTHS = 93.0 DEG AND 99.89 DEG
    - PARKING ORBIT INCLINATIONS = 28.470 DEG AND 29.818 DEG
    - DELTA STAGE II PCS (S/C MASS = 1060.0 KG) = 98.6% AND 97.9%
  - NOV 16 THROUGH NOV 25, 1996
    - ONE OPPORTUNITY PER DAY
      - SHORT COAST
    - LAUNCH AZIMUTH = 110.0 DEG
    - PARKING ORBIT INCLINATION = 36.5 DEG (DOG-LEG TRAJECTORY)
    - DELTA STAGE II PCS (S/C MASS = 1060.0) = 97.3%

LAUNCH WINDOW

- LAUNCH WINDOWS (INSTANTANEOUS)
  - THE DESIRED (PLANAR) LAUNCH TIME FOR EACH LAUNCH OPPORTUNITY IS BASED ON A DELTA FLIGHT PROFILE THAT ACHIEVES THE TARGETING CONDITIONS SPECIFIED IN THE MGS FINAL TARGET SPECIFICATION DOCUMENT -- THIS DESIRED (PLANAR) LAUNCH TIME WILL BE SPECIFIED TO THE NEAREST INTEGER SECOND
  - AN OPPORTUNITY TO LAUNCH WILL EXIST 30 SECONDS PRIOR TO THE DESIRED LIFTOFF TIME AND WILL BE USED ONLY IN THE EVENT THE EASTERN TEST RANGE (ETR) ISSUES A COLLISION AVOIDANCE (COLA) WARNING (ACCOMODATES ETR COLA REQUIREMENT)
    - COLA WARNINGS WILL BE ISSUED AT 24 AND 2-HOURS PRIOR TO LAUNCH
      - 24-HOURS PRIOR TO LAUNCH --> PRELIMINARY LAUNCH TIME SELECTED
      - 2-HOURS PRIOR TO LAUNCH --> FINAL LAUNCH TIME SELECTED
  - THE LAUNCH WINDOW FOR EACH LAUNCH OPPORTUNITY WILL OPEN 30 SECONDS BEFORE AND CLOSE AT THE DESIRED LAUNCH TIME



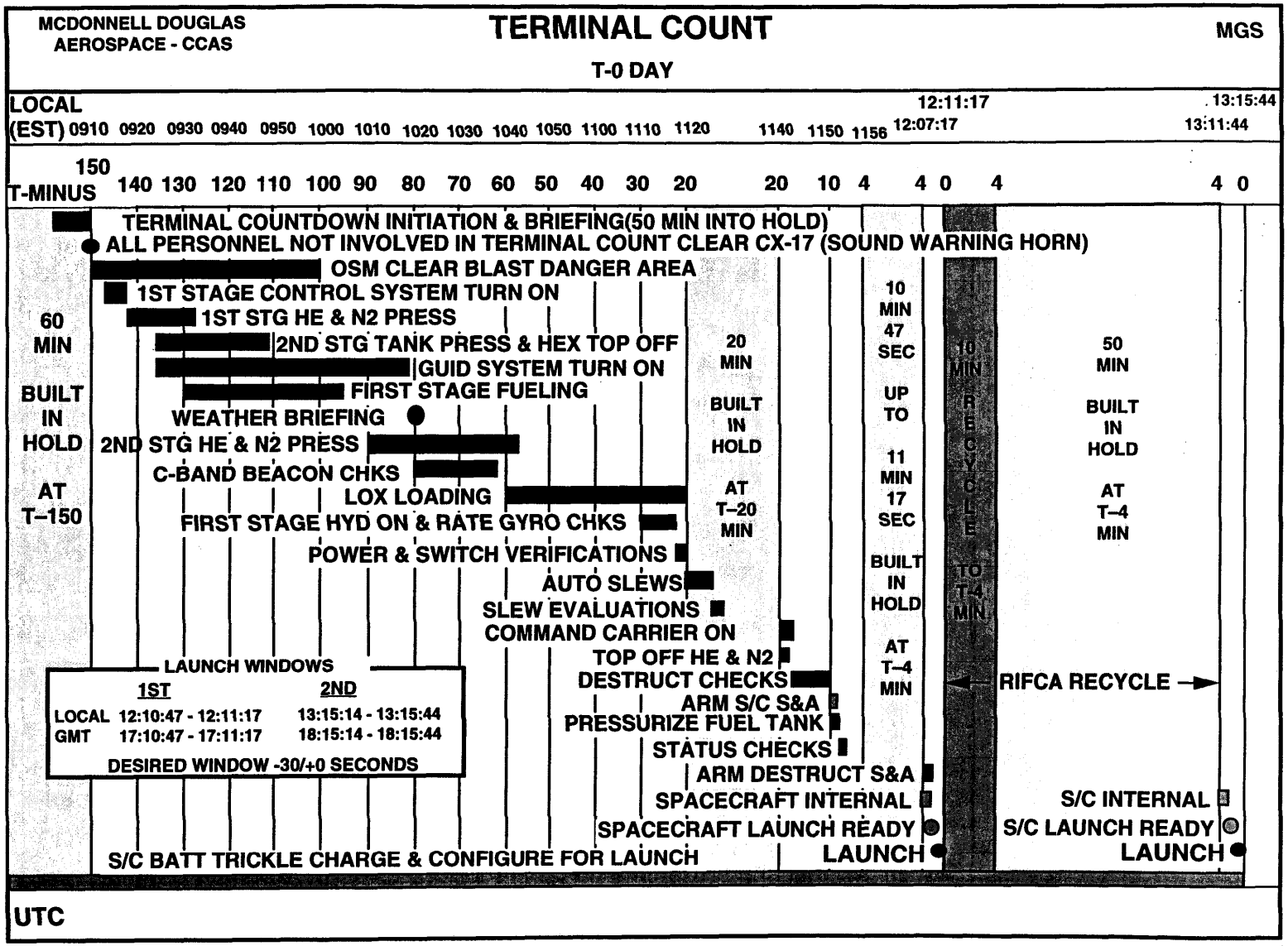
November 6, 1996 (Launch Period Open)		COLA LAUNCH TIME	DESIRED LAUNCH TIME		COLA LAUNCH TIME	DESIRED LAUNCH TIME
	EST	12:10:47	12:11:17	EST	13:15:14	13:15:44
	UTC	17:10:47	17:11:17	UTC	18:15:14	15:15:44

TERMINAL COUNT (1 OF 2)

- TERMINAL COUNT
  - THREE BUILT-IN HOLDS DURING THE TERMINAL COUNT
    - 60 MINUTE BUILT IN HOLD AT T-150 MINUTES
    - 20 MINUTE BUILT IN HOLD AT T-20 MINUTES
    - 10 MINUTE BUILT IN HOLD AT T-4 MINUTES
  - THE COUNTDOWN PRIOR TO THE HOLD AT T-4 MINUTES WILL BE BASED ON A LIFTOFF AT THE INTEGER MINUTE PRECEEDING (OR AT) THE LAUNCH WINDOW'S OPENING
  - THE T-4 MINUTE HOLD WILL BE EXTENDED TO ADJUST THE LIFTOFF TIME TO THE DESIRED (OR COLA REQUIRED) TIME OF THAT DAY'S FIRST LAUNCH (OR ONLY) LAUNCH OPPORTUNITY
    - THIS HOLD WILL ALSO BE EXTENDED WHEN THE TIME OF LIFTOFF MUST BE DELAYED TO THE DESIRED (OR COLA REQUIRED) TIME OF THAT DAY'S SECOND LAUNCH OPPORTUNITY
    - IF THE COUNTDOWN PROCEEDS PAST T-4 MINUTES AND THE LAUNCH MUST THEN BE DELAYED TO THE SECOND LAUNCH OPPORTUNITY, THE COUNTDOWN WILL RECYCLE TO THE HOLD AT T-4 MINUTES

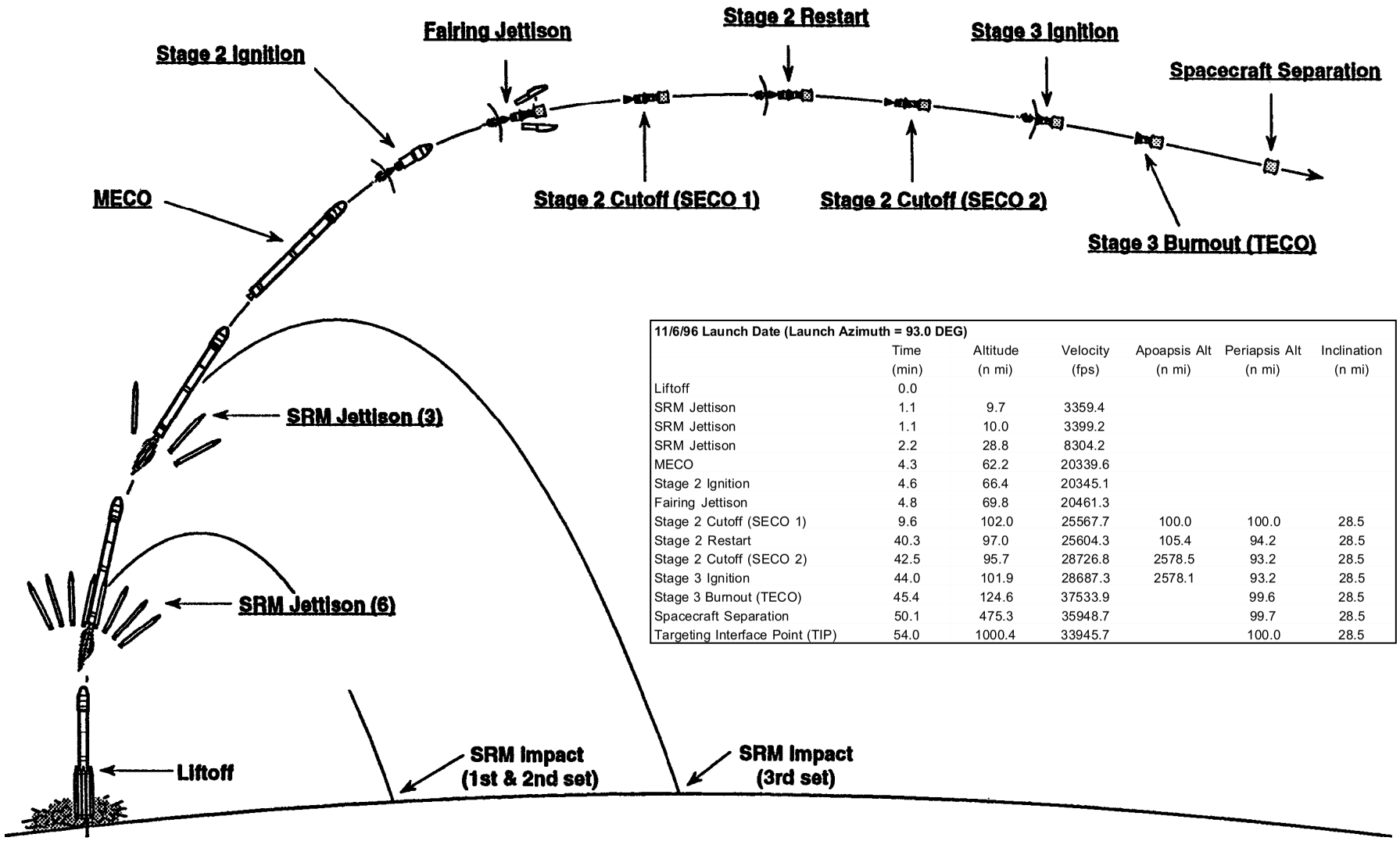
Mars Global Surveyor

TERMINAL COUNT (2 OF 2)



LAUNCH OVERVIEW

DELTA II 7925A FLIGHT PROFILE OVERVIEW



11/6/96 Launch Date (Launch Azimuth = 93.0 DEG)

	Time (min)	Altitude (n mi)	Velocity (fps)	Apoapsis Alt (n mi)	Periapsis Alt (n mi)	Inclination (n mi)
Liftoff	0.0					
SRM Jettison	1.1	9.7	3359.4			
SRM Jettison	1.1	10.0	3399.2			
SRM Jettison	2.2	28.8	8304.2			
MECO	4.3	62.2	20339.6			
Stage 2 Ignition	4.6	66.4	20345.1			
Fairing Jettison	4.8	69.8	20461.3			
Stage 2 Cutoff (SECO 1)	9.6	102.0	25567.7	100.0	100.0	28.5
Stage 2 Restart	40.3	97.0	25604.3	105.4	94.2	28.5
Stage 2 Cutoff (SECO 2)	42.5	95.7	28726.8	2578.5	93.2	28.5
Stage 3 Ignition	44.0	101.9	28687.3	2578.1	93.2	28.5
Stage 3 Burnout (TECO)	45.4	124.6	37533.9		99.6	28.5
Spacecraft Separation	50.1	475.3	35948.7		99.7	28.5
Targeting Interface Point (TIP)	54.0	1000.4	33945.7		100.0	28.5

MGS DELTA II FLIGHT PROFILE

LAUNCH PERIOD				LAUNCH WINDOW				LIFTOFF TIMES	
Launch Day	1996 Launch Date DD-MM	Launch Azimuth (deg)	Parking Orbit Inc (deg)	*MDA DTO Short Coast Liftoff Time wrt Midnight UTC (secs)*	MDA DTO Short Coast COLA Liftoff Time (UTC) HH:MM:SS.S	MDA DTO Short Coast Desired Liftoff Time (UTC) HH:MM:SS.S	Liftoff Time Separation ΔT HH:MM:SS.S	MDA DTO Short Coast Desired Liftoff Time (Eastern) HH:MM:SS.S	MDA DTO Short Coast Desired Liftoff Time (Pacifc) HH:MM:SS.S
~~*1*~~	~~*05-Nov*~~	~~*93.00*~~	~~*28.470*~~	~~*62489.820*~~	~~*17:20:59.8*~~	~~*17:21:29.820*~~	~~–~~	~~*12:21:29.8*~~	~~*09:21:29.8*~~
~~*1*~~	~~*05-Nov*~~	~~*99.89*~~	~~*29.818*~~	~~*66342.180*~~	~~*18:25:12.2*~~	~~*18:25:42.180*~~	~~*01:04:12.4*~~	~~*13:25:42.2*~~	~~*10:25:42.2*~~
1	06-Nov	93.00	28.470	61876.703	17:10:46.7	17:11:16.703	-	12:11:16.7	09:11:16.7
1	06-Nov	99.89	29.818	65744.259	18:15:14.3	18:15:44.259	01:04:27.6	13:15:44.3	10:15:44.3
2	07-Nov	93.00	28.470	61249.868	17:00:19.9	17:00:49.868	-	12:00:49.9	09:00:49.9
2	07-Nov	99.89	29.818	65156.373	18:05:26.4	18:05:56.373	01:05:06.5	13:05:56.4	10:05:56.4
3	08-Nov	93.00	28.470	60491.067	16:47:41.1	16:48:11.067	-	11:48:11.1	08:48:11.1
3	08-Nov	99.89	29.818	64449.165	17:53:39.2	17:54:09.165	01:05:58.1	12:54:09.2	09:54:09.2
4	09-Nov	93.00	28.470	59720.282	16:34:50.3	16:35:20.282	-	11:35:20.3	08:35:20.3
4	09-Nov	99.89	29.818	63738.843	17:41:48.8	17:42:18.843	01:06:58.6	12:42:18.8	09:42:18.8
5	10-Nov	93.00	28.470	58805.070	16:19:35.1	16:20:05.070	-	11:20:05.1	08:20:05.1
5	10-Nov	99.89	29.818	62902.767	17:27:52.8	17:28:22.767	01:08:17.7	12:28:22.8	09:28:22.8
6	11-Nov	93.00	28.470	57886.636	16:04:16.6	16:04:46.636	-	11:04:46.6	08:04:46.6
6	11-Nov	99.89	29.818	62076.737	17:14:06.7	17:14:36.737	01:09:50.1	12:14:36.7	09:14:36.7
7	12-Nov	93.00	28.470	56774.298	15:45:44.3	15:46:14.298	-	10:46:14.3	07:46:14.3
7	12-Nov	99.89	29.818	61094.522	16:57:44.5	16:58:14.522	01:12:00.2	11:58:14.5	08:58:14.5
8	13-Nov	93.00	28.470	55490.394	15:24:20.4	15:24:50.394	-	10:24:50.4	07:24:50.4
8	13-Nov	99.89	29.818	59997.063	16:39:27.1	16:39:57.063	01:15:06.7	11:39:57.1	08:39:57.1
9	14-Nov	93.00	28.470	54135.572	15:01:45.6	15:02:15.572	-	10:02:15.6	07:02:15.6
9	14-Nov	99.89	29.818	58521.110	16:14:51.1	16:15:21.110	01:13:05.5	11:15:21.1	08:15:21.1
10	15-Nov	93.00	28.470	52198.334	14:29:28.3	14:29:58.334	-	09:29:58.3	06:29:58.3
10	15-Nov	99.89	29.818	56846.984	15:46:57.0	15:47:26.984	01:17:28.7	10:47:27.0	07:47:27.0
11	16-Nov	110.00	36.500	66992.739	18:36:02.7	18:36:32.739	-	13:36:32.7	10:36:32.7
12	17-Nov	110.00	36.500	66077.203	18:20:47.2	18:21:17.203	-	13:21:17.2	10:21:17.2
13	18-Nov	110.00	36.500	65223.814	18:06:33.8	18:07:03.814	-	13:07:03.8	10:07:03.8
14	19-Nov	110.00	36.500	64360.260	17:52:10.3	17:52:40.260	-	12:52:40.3	09:52:40.3
15	20-Nov	110.00	36.500	63266.737	17:33:56.7	17:34:26.737	-	12:34:26.7	09:34:26.7
16	21-Nov	110.00	36.500	62257.190	17:17:07.2	17:17:37.190	-	12:17:37.2	09:17:37.2
17	22-Nov	110.00	36.500	61157.494	16:58:47.5	16:59:17.494	-	11:59:17.5	08:59:17.5
18	23-Nov	110.00	36.500	59583.787	16:32:33.8	16:33:03.787	-	11:33:03.8	08:33:03.8
19	24-Nov	110.00	36.500	57943.703	16:05:13.7	16:05:43.703	-	11:05:43.7	08:05:43.7
20	25-Nov	110.00	36.500	54585.010	15:09:15.0	15:09:45.010	-	10:09:45.0	07:09:45.0
	Italics - Data Entries				COLA ΔT 30			UTC-EST 5	EST-PST 3

08/02/96

MGS DELTA II FLIGHT PROFILE

TARGETING INTERFACE POINT			SPACECRAFT TRANSMITTER ON / START OF DSN INITIAL ACQUISITION				
Targeting Interface Point (TIP) [secs from liftoff]	Targeting Interface Point (TIP) [mins from liftoff]	TIP Time (SIII Ign + 10 Min) (UTC) HH:MM:SS.S	Spacecraft XMTR On [secs from liftoff]	Spacecraft XMTR On [mins from liftoff]	Spacecraft XMTR On (UTC) HH:MM:SS.S	Spacecraft XMTR On [secs from injection]	*Spacecraft XMTR On [secs from separation]*
~~3222.508~~	~~53.708~~	~~18:15:12.3~~	~~4282.988~~	~~71.383~~	~~18:32:52.8~~	~~1573.170~~	~~1290.9~~
~~3016.845~~	~~50.281~~	~~19:15:59.0~~	~~4077.325~~	~~67.955~~	~~19:33:39.5~~	~~1573.170~~	~~1290.9~~
3238.130	53.969	18:05:14.8	4298.610	71.644	18:22:55.3	1573.170	1290.9
3030.907	50.515	19:06:15.2	4091.387	68.190	19:23:55.6	1573.170	1290.9
3258.022	54.300	17:55:07.9	4318.502	71.975	18:12:48.4	1573.170	1290.9
3048.742	50.812	18:56:45.1	4109.222	68.487	19:14:25.6	1573.170	1290.9
3283.209	54.720	17:42:54.3	4343.689	72.395	18:00:34.8	1573.170	1290.9
3071.166	51.186	18:45:20.3	4131.646	68.861	19:03:00.8	1573.170	1290.9
3310.914	55.182	17:30:31.2	4371.394	72.857	17:48:11.7	1573.170	1290.9
3095.638	51.594	18:33:54.5	4156.118	69.269	18:51:35.0	1573.170	1290.9
3344.360	55.739	17:15:49.4	4404.840	73.414	17:33:29.9	1573.170	1290.9
3124.845	52.081	18:20:27.6	4185.325	69.755	18:38:08.1	1573.170	1290.9
3379.557	56.326	17:01:06.2	4440.037	74.001	17:18:46.7	1573.170	1290.9
3155.202	52.587	18:07:11.9	4215.682	70.261	18:24:52.4	1573.170	1290.9
3423.496	57.058	16:43:17.8	4483.976	74.733	17:00:58.3	1573.170	1290.9
3192.065	53.201	17:51:26.6	4252.545	70.876	18:09:07.1	1573.170	1290.9
3476.313	57.939	16:22:46.7	4536.793	75.613	16:40:27.2	1573.170	1290.9
3234.905	53.915	17:33:52.0	4295.385	71.590	17:51:32.4	1573.170	1290.9
3534.519	58.909	16:01:10.1	4594.999	76.583	16:18:50.6	1573.170	1290.9
3295.215	54.920	17:10:16.3	4355.695	72.595	17:27:56.8	1573.170	1290.9
3622.385	60.373	15:30:20.7	4682.865	78.048	15:48:01.2	1573.170	1290.9
3367.819	56.130	16:43:34.8	4428.299	73.805	17:01:15.3	1573.170	1290.9
2837.744	47.296	19:23:50.5	3898.224	64.970	19:41:31.0	1573.170	1290.9
2872.202	47.870	19:09:09.4	3932.682	65.545	19:26:49.9	1573.170	1290.9
2904.742	48.412	18:55:28.6	3965.222	66.087	19:13:09.0	1573.170	1290.9
2938.010	48.967	18:41:38.3	3998.490	66.642	18:59:18.7	1573.170	1290.9
2982.142	49.702	18:24:08.9	4042.622	67.377	18:41:49.4	1573.170	1290.9
3022.733	50.379	18:07:59.9	4083.213	68.054	18:25:40.4	1573.170	1290.9
3067.779	51.130	17:50:25.3	4128.259	68.804	18:08:05.8	1573.170	1290.9
3135.720	52.262	17:25:19.5	4196.200	69.937	17:43:00.0	1573.170	1290.9
3207.034	53.451	16:59:10.7	4267.514	71.125	17:16:51.2	1573.170	1290.9
3362.122	56.035	16:05:47.1	4422.602	73.710	16:23:27.6	1573.170	1290.9

08/02/96