

ESD RECORD COPY

RETURN TO
SCIENTIFIC & TECHNICAL INFORMATION DIVISION
(ESTI), BUILDING 1211

ESD ACCESSION LISTESTI Call No. AL 53839Copy No. 1**Technical Note****1966-55**

W. R. Crowther

Haystack Pointing System: Scan

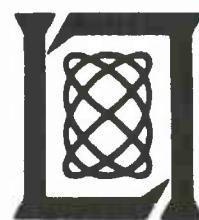
1 November 1966

Prepared under Electronic Systems Division Contract AF 19(628)-5167 by

Lincoln Laboratory

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Lexington, Massachusetts



AD643171

[Handwritten signature]

The work reported in this document was performed at Lincoln Laboratory,
a center for research operated by Massachusetts Institute of Technology,
with the support of the U.S. Air Force under Contract AF 19(628)-5167.

This report may be reproduced to satisfy needs of U.S. Government agencies.

Distribution of this document is unlimited.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
LINCOLN LABORATORY

HAYSTACK POINTING SYSTEM: SCAN

W. R. CROWTHER

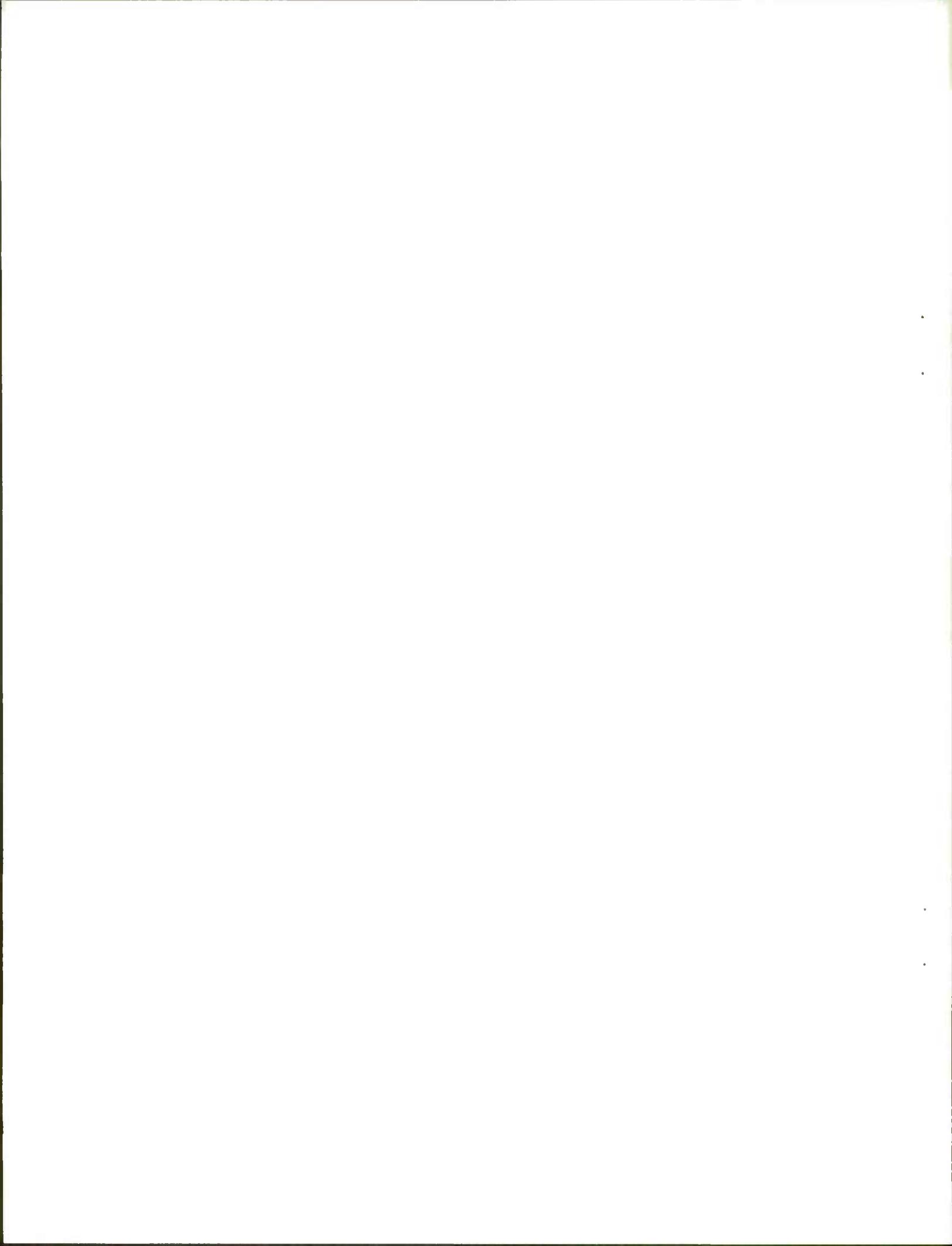
Group 62

TECHNICAL NOTE 1966-55

1 NOVEMBER 1966

LEXINGTON

MASSACHUSETTS



ABSTRACT

As one of its options, the Haystack Pointing system can superpose a scan on any other pointing task. The available scans include both simple one-dimensional scans and area-covering scans.

Accepted for the Air Force
Franklin C. Hudson
Chief, Lincoln Laboratory Office

HAYSTACK POINTING SYSTEM: SCAN

INTRODUCTION

The antenna pointing program for the Haystack Univac 490 computer includes provisions for superposing a variety of possible scans on any of the normal computer-directed antenna pointing modes. The center position of such scanning follows the computed position of the selected target. A description of the possible scans and the program which implements them follows.

PROGRAM INPUTS

1. Time (DSECONDS)
2. Computed Right Ascension (RA)
3. Computed Declination (DEC)
4. Computed Azimuth (AZ)
5. Computed Elevation (EL)
6. Sine and Cos of Track Angle (described below)
7. Complex interaction with an operator via the keyboard and its servicing program "INTERCOM".

Since the main pointing program must have RA and DEC to compute AZ and EL, the scan program is actually called twice, once to scan in RA-DEC and once in AZ-EL. The master control program believes there are two scan programs called AESCAN (for Azimuth-Elevation Scan) and RDSCAN (Right-Ascension-Declination Scan). Actually there are just two entries to one program.

PROGRAM OUTPUTS

1. Right Ascension with Scan Added
2. Declination with Scan Added
3. Azimuth with Scan Added
4. Elevation with Scan Added

COORDINATES

The Scan program recognizes 6 coordinate axes. These are Azimuth, Elevation, Right Ascension, Declination, Along Track, and Across Track. Across Track is

orthogonal to Along Track and the radius vector, and the remainder are self explanatory. For the most part these are treated as similar but independent axes. For example, there is one subroutine which computes a simple back and forth scan, and this subroutine is used six times to get six different scans. For some area-type scans two axes are involved. Again there is only one subroutine involved, but it now provides a pair of displacements which are added to one of the three coordinate pairs. When order of the pair is considered, there are 6 possible scans from this subroutine.

Since Along Track and Across Track are not normal system axes, scans along these axes must be converted to Azimuth and Elevation displacements. This is done using the knowledge of the angle between the two axis-pairs (See Fig. 1).

3-60-5641

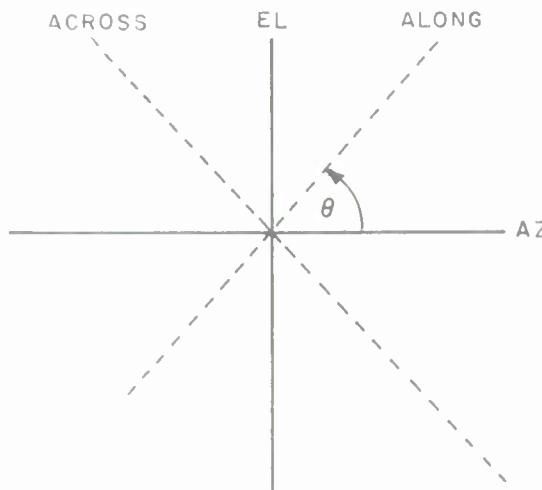


Fig. 1.

The Sine and Cos of the angle θ in the figure are among the inputs to the program, if AL and AC are the displacements in Along and Across, then

$$AZ = AL \cos \theta - AC \sin \theta$$

$$EL = AL \sin \theta + AC \cos \theta$$

The implementation of Along – Across in AZ-EL instead of in RA-DEC was a choice of the lesser of evils. In AZ-EL one specified directly the radar angular rate and angular extent of the scan. In RA-DEC, for approximately circular orbits, one specifies quantities more closely related to the velocity in n. m./sec and extent in n. m. In neither case is one scanning in range to stay on the track in that variable.

As scan is constructed, it is impossible to scan in AZ-EL and Along-Across simultaneously.

The axes are related in one further way, which involves the phase of the scans. Time is the key variable for determining the next step in the scan process, and is arranged so that a time of zero corresponds to the low end of the scan. In order to start a scan at a particular place (the center for example) a constant called "Time Zero" is subtracted from time before the various routines are called. There are only two such constants, one for AZ-EL or Along-Across and one for RA-DEC. This has the effect of forcing simultaneous scans in AZ and EL (or RA and DEC) to have the same time zero, or phase, which means there will probably be a discontinuity in one scan when the second is initialized.

BACK AND FORTH SCAN

The "back and forth" Scan is the basic scan. It is used as six different scan options (one for each coordinate axis), and is also used as a component of the Area-Oriented "Box Scans." See Fig. 2 for a sketch of this basic scan.

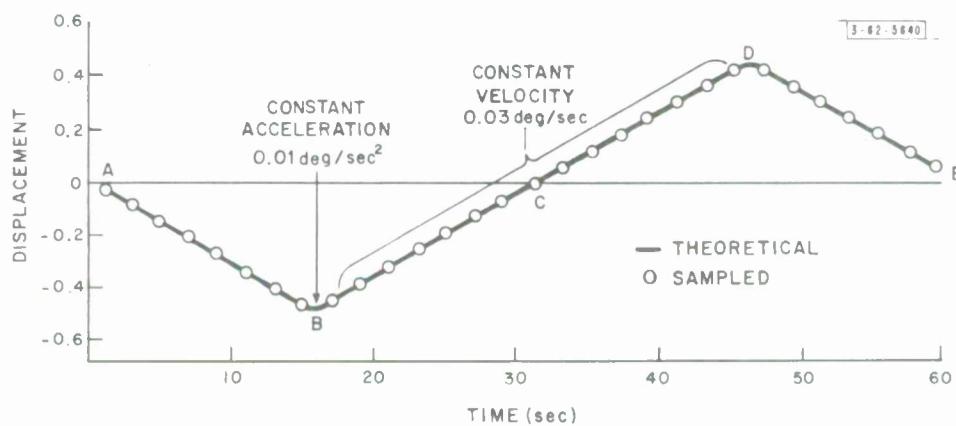


Fig. 2. Example of one full period of the basic BACK AND FORTH scan.

The back and forth scan is computed in 4 symmetrical sections, (AB, BC, CD, DE in Fig. 2) each section consisting of a period of constant acceleration and a period of constant velocity. The acceleration is always for three seconds, * unless the total

*3 secs of max. antenna acceleration produces maximum antenna velocity.

time available is less than 3 seconds per section, in which case the acceleration is continuous through the whole scan. The acceleration is computed so that the scan is completed in the allotted period:

$$\frac{1}{2} a(3)^2 + 3a(p/4 - 3) = A \quad p > 12$$

or $\frac{1}{2} a(p/4)^2 = A \quad p \leq 12$

where a = acceleration

A = half Arc (Amplitude) of scan

p = period of scan

The constant velocity of course is $3a$.

Simplifying and solving for a :

$$a = \frac{4}{3} \cdot \frac{A}{p-6} \quad p > 12$$

$$a = \frac{32A}{p^2} \quad p \leq 12$$

In actuality, scan does not produce a continuous output, but rather discrete points every interpolation interval. Whether scan actually follows the desired curve depends on a complex interaction with the interpolation program and the antenna servo.

The program that computes a back and forth scan compares time* to period to discover where it is on the scan. It then divides the scan into two similar half scans (increasing and decreasing) which are processed by a single subroutine. This subroutine further divides each half scan into two quarter scans processed by a second subroutine.

That routine divides the quarter into an accelerating part and a coasting part using the formulas above to determine velocity and acceleration, and computes actual position. The output of the "BACK AND FORTH" routine is a displacement which will be added to the appropriate center position to create a scan.

*Remember that the zero of time has been set artificially to start the scan at its center.

BOX SCAN

The "Box Scan" is an area-covering scan. It is used in 3 different coordinate systems, and applied in 2 different ways in each system. The output of the BOX SCAN routine is two values, which produce a Box-Like scan when added to the appropriate center positions. Figure 3 is a sketch of this basic scan.

The comments under back and forth scan about the discrete spacing of the actual scan output apply here also, and in fact the BOX SCAN does a back and forth scan in one coordinate while simply stepping the other coordinate at the end points. This discontinuity in the second coordinate produces an error as the antenna servo tries to cope with infinite acceleration, but it was felt that the step would be small and relatively infrequent, so that the transient would not matter. At the end of the box the whole scan repeats, causing another transient as the antenna moves back to the initial corner of the box. There is no limit to the number of lines per box, and the number may be odd or even. The illustration (Fig. 4) is perhaps unrealistic in having so few lines (4) but more present a bit of a drawing problem.

The Box Scan program compares time to the overall period to determine location in the scan. It then uses that part of the back and forth routine which processes half a period (one line) to get displacement 1 and computes the simpler displacement 2 itself.

CONVENIENCE SCANS

There are a number of scan options which are not really scans but are included here for lack of a more appropriate place. They include constant offsets, which are simply added to the center positions before any other action; holding all scans, which is accomplished by presenting the scans with a phony time set at the time of the hold; restarting which undoes the hold and moves the time origin so that the scan picks up where it left off; and clearing all scans.

INTERNAL LOGIC

This section presents in a more organized way the block diagram implied by the discussion above, and includes a list of key registers with their actual program names.

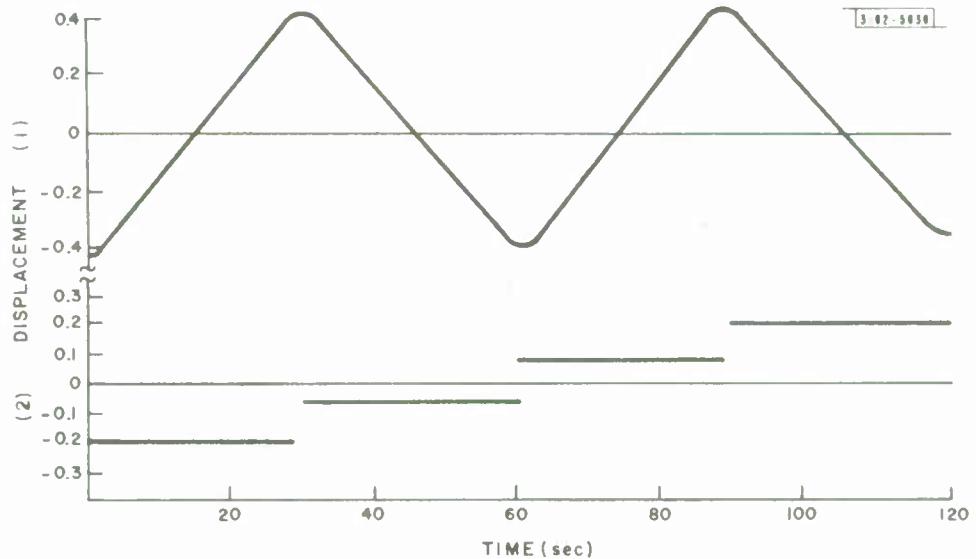


Fig. 3. Example of one full period of the box scan.

Time per Line = 30 sec

Lines per Box = 4 (normally one would use more, but it clutters the picture)

Length of Box = .81 degrees

Line Spacing = .133 degrees

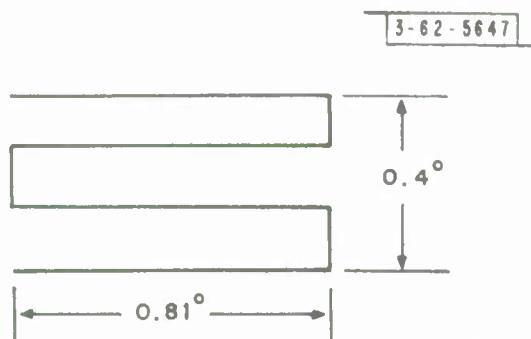


Fig. 4. Box scan as seen in space coordinates.

AZ-EL Entry

```
Move Input AZ-EL  
To Output AZ-EL, Adding  
AZ, EL, Along, and Across  
Offsets in the Process  
|  
Compute Internal Time  
|  
Do AZ SCAN if requested (use BACK AND FORTH)  
|  
Do EL SCAN if requested (use BACK AND FORTH)  
|  
Do AZ-EL BOX SCAN if requested (use BOX SCAN)  
|  
If AZ-EL is Really Along-Across rotate the above answers through the angle  $\theta$   
|  
Add the Scans into the output  
|  
Return
```

RA-DEC Entry

```
Move Input RA-DEC to Output RA-DEC, adding RA and DEC Offsets in the  
process  
|  
Compute Internal Time  
|  
Do RA Scan If Requested (use BACK AND FORTH)  
|  
Do DEC Scan If Requested (use BACK AND FORTH)  
|  
Do RA-DEC BOX SCAN If Requested (use BOX SCAN)  
|  
Add the Scans into the Output  
|  
Return
```

BACK AND FORTH:

Break the scan in half and use LINE

LINE:

Break the line in half and use LINEX

$$\text{LINEX: } a = \frac{4}{3} \frac{A}{p-6} \quad p > 12$$

$$\frac{8A}{p} \quad p \leq 12$$

$$\text{displacement} = \frac{1}{2} a(T)^2 \quad T \leq 2$$

$$\frac{1}{2} a^3 + 3a(T-3) \quad T > 2$$

where $T =$ Time from the acceleration end of the half line.

BOXSCAN: Compute displacement 1 using LINE
Compute displacement 2

KEY REGISTERS

<u>NAME</u>	<u>MEANING</u>
M1	0 means no AZ-EL box scan
M2	0 means no AZ scan
M3	0 means no EL scan
M4	0 means no RA-DEC box scan
M5	0 means no RA scan
M6	0 means no DEC scan
M7	1 means AZ-EL is really along-across
M8	0 means lines along AZ in AZ-EL box
M9	0 means lines along RA in RA-DEC box
M10	1 means hold scan
KKAL	Azimuth offset in revolutions B27
KKEL	Elevation offset in revolutions Ba7
KKRL	RA offset in revolutions B27
KKDL	DEC offset in revolutions B27
KKCL	Across offset in revolutions B27
KKLL	Along offset in revolutions B27
KAT	Azimuth period in seconds
KET	Elevation period in seconds
KDT	DEC period in seconds

<u>NAME</u>	<u>MEANING</u>
KRT	RA period in seconds
KAL	Azimuth whole arc length in revolutions B27
KEL	Elevation whole arc length in revolutions B27
KDL	Declination whole arc length in revolutions B27
KRL	RA whole arc length in revolutions B27
NULL	Time origin for RA-DEC scans
NULLY	Time origin for AZ-EL scans
AEBOX	Total time per box in seconds (AZ-EL)
+ 1	Box length in revolutions B27 (AZ-EL)
+ 2	Number of lines per box (AZ-EL)
+ 3	Line spacing in revolutions B27 (AZ-EL)
+ 4	Time per line in sec (AZ-EL)
+ 5	0 means lines along AZ in AZ-EL box (AZ-EL)
RD BOX	Like AE BOX

INITIALIZATION

The function of initialization is to set up the 38 key registers described in the Logic Section, so that the operating part of the program can do its job. Mostly, initialization simply asks the operator for each number it should use. See Appendix A for a complete run through of all the possible scan questions with typical answers.

Initialization is called in two different modes by the master control program. In Mode 1 it performs the clear all scan function, an option which is also available to the operator. (This amounts to zeroing registers M0 through M10.) In Mode 2 initialization asks the operator to set up a scan: when he has done so, it asks for another, and so on indefinitely. Mode 1 is used when master control wants to start over. Mode 2 when scan has been requested via the attention symbol.

When a scan is selected initialization must set the appropriate zero point of time. This is done by putting either the current time or current time plus a quarter period in the appropriate zero register. It is probable that one will be off by a second or two, because there is an unknown delay between the time of striking a key and the operation of scan initialization, and a further unknown delay between scan initialization

and scan operation. When a scan is "held" initialization tries as best it can to stop at the time of the struck key, but there is an obvious difficulty, compounded by the fact that the system is 6 seconds ahead of real time. (This is not the appropriate place to discuss the complex subject of system timing - I merely wish to explain why the hold option is not a good way to come to a precise stop.)

It is possible to ask for an unreasonable acceleration, for example by selecting a zero period. Whenever this might occur, initialization computes the period corresponding to a $3^0/\text{sec}^2$ acceleration. ($p = 6 + \frac{4}{9}A$ $A > \frac{27}{2}$, $p = 4\sqrt{2/3}A$ $A < 27/2$. If the chosen period is too small initialization uses the computed period and tells the operator what has happened.

Initialization rounds all odd periods to the next lower even period, for internal convenience.

If one asks for a zero spacing of lines in a box, initialization will substitute one beamwidth. This is perhaps of some convenience in the AZ-EL Box Scan.

APPENDIX A

*
SIGN OFF(1) MOD(2) NEXT RUN(3) PRINT(4) 2*
AZ-EL(1) DATA PROCESSING(2) SCAN(3) RECORDING(4) TIMING(5) OTHER(6)
3*
SELECT SCAN OR OFFSET
CLEAR(0),HOLD(1),RESUME(2)
AZSCAN(3),ELSCAN(4),AZELBOX(5),AZOFFSET(6),ELOFFSET(7)
RASCAN(8),DFCSCAN(9),RADECBOX(10),RAOFFSET(11),DECOFFSET(12)
ORBIT- CROSSCAN(13),ALONGSCAN(14),BOX(15),CROSSOFFSET(16),ALONGOFFSET(17)
DRIFT SCAN(18) 0*
Cleared-RESELECT AT WILL 1*
HELD-RESELECT AT WILL 2*
RESUMED-RESELECT AT WILL 3*
AZ SCAN
PERIOD IN SEC = 30*
HALF-ARC IN DEGREES 1*
SCANNING-RESELECT AT WILL 4*
EL SCAN
PERIOD IN SEC = 30*
HALF-ARC IN DEGREES 1*
SCANNING-RESELECT AT WILL 5*
AE BOX SCAN
ARC IN DEGREES 1*
LINES PER BOX = 10*
SPACING IN DEG= .25*
TIME/LINE(SEC)= 10*
LINES PARALLEL TO AZ(0),EL(1) 0*
SCANNING-RESELECT AT WILL 6*
AZ OFFSET IN DEGREES 10*
OFFSET-RESELECT AT WILL 7*
EL OFFSET IN DEGREES 10*
OFFSET-RESELECT AT WILL 8*
RA SCAN
PERIOD IN SEC = 30*
HALF-ARC IN DEGREES 1*
SCANNING-RESELECT AT WILL 9*
DEC SCAN
PERIOD IN SEC = 30*
HALF-ARC IN DEGREES 1*

SCANNING-RESELECT AT WILL 10*

RA-DEC BOX SCAN

ARC IN DEGREES 1*

LINES PER BOX = 10*

SPACING IN DEG= .25*

TIME/LINE(SEC)= 10*

LINES PARALLEL TO RA(0),DEC(1) 0*

SCANNING-RESELECT AT WILL 11*

RA OFFSET IN DEGREES 45*

OFFSET-RESELECT AT WILL 12*

DEC OFFSET IN DEGREES 25*

OFFSET-RESELECT AT WILL 13*

ACROSS SCAN

PERIOD IN SEC = 30*

HALF-ARC IN DEGREES 1*

SCANNING-RESELECT AT WILL 14*

ALONG SCAN

PERIOD IN SEC = 30*

HALF-ARC IN DEGREES 1*

SCANNING-RESELECT AT WILL 15*

AL-ACR BOX SCAN

ARC IN DEGREES 1*

LINES PER BOX = 10*

SPACING IN DEG= .25*

TIME/LINE(SEC)= 10*

LINES PARALLEL TO ORBIT(0),ACROSS ORBIT(1) 0*

SCANNING-RESELECT AT WILL 16*

CROSS-ORBIT OFFSET (DEG) 45*

OFFSET-RESELECT AT WILL 17*

ALONG-ORBIT OFFSET (DEG) 30*

OFFSET-RESELECT AT WILL 18*

RA OFFSET IN DEGREES 45*

DEC OFFSET IN DEGREES 45*

CARRIAGE RETURN TO START DRIFT SCAN *

DRIFTING-RESELECT AT WILL

APPENDIX B

SPURT OUTPUT NO. 110					
SCAN			CROWTHER#4APR66		
CARDS	L1	ID LABEL	TA STATEMENT	LOC	F JKB Y NOTES
.	00000	SCAN	PROGRAM CROWTHER#4APR66		
.	00001	SCANX	U-TAG SCAN1*SCAN	00000	00760 00003
.	00002		FD 1*ADSCN	00001	06113 01023
.	00003	IC	EQUALS INTERCOM		
.	00004	TT	O O	00002	00000 00000
.	00005	TYME	EQUALS DSECONDS		
.	00006	AZ1	EQUALS AZIM		
.	00007	AZ2	EQUALS SAZIM		
.	00010	EL1	EQUALS ELEV		
.	00011	EL2	EQUALS SELEV		
.	00012	RA1	EQUALS RA		
.	00013	RA2	EQUALS SRA		
.	00014	DN1	EQUALS DEC		
.	00015	DN2	EQUALS SDEC		
.	00016	ANS	EQUALS SINAZEL		
.	00017	ANC	EQUALS COSAZEL		
.	00020	M1	EQUALS AZELBXS CAN		
.	00021	M2	EQUALS AZMTHSCAN		
.	00022	M3	EQUALS ELVTNSCAN		
.	00023	M4	EQUALS RADCBXS CAN		
.	00024	M5	EQUALS RASCTNSCAN		
.	00025	M6	EQUALS DECLINSCAN		
.	00026	M7	EQUALS ALNGACRSCN		
.	00027	M8	EQUALS AEBOXLINES		
.	00030	M9	EQUALS RD BOXLINES		
.	00031	M10	EQUALS HOLDNOHOLD		
.	00032	KKAL	EQUALS AZIMOFFSET		
.	00033	KKEL	EQUALS ELEVOFFSET		
.	00034	KKRL	EQUALS RAOFFSET		
.	00035	KKDL	EQUALS DECOFFSET		
.	00036	KKCL	EQUALS CRSSOFFSET		
.	00037	KKLL	EQUALS ALNGOFFSET		
.	00040	TOME	EQUALS TIMETOHOLD		
.	00041	KET	EQUALS PERIODELEV		
.	00042	KEL	EQUALS ARCOFELEV		
.	00043	KAT	EQUALS PERIODAZIM		
.	00044	KAL	EQUALS ARCOFAZIM		
.	00045	KDT	EQUALS PERIODDEC		
.	00046	KDL	EQUALS ARCOFDEC		
.	00047	KRT	EQUALS PERIODRA		
.	00050	KRL	EQUALS ARCOFRA		
.	00051	NULL	EQUALS RADECOTIME		
.	00052	NULLY	EQUALS AZELOTIME		
.	00053	SCAN	JP O	00003	61000 00000 MASTER CONTROL ENTRY
.	00054		ADD A*0*ANOT	00004	20500 00000
.	00055		JP MCR	00005	61000 00012
.	00056		CL W(DRIFTFLAG)	00006	16030 02121
.	00057		CLEAR 16D*M1	00007	70100 00020
.				00010	16030 63500
.	00060		JP SCAN	00011	61000 00003
.	00061	MCR	RJP U(IC)	00012	65020 63426
.	00062		U-TAG UOHNDOID1	00013	02017 01337

00063	MCQQ	ENT	B7*L(KIND)	00014	12710	01263
00064		JP	L(JPTAB+B7)	00015	61017	00016
00065	JPTAH	O	MC0	00016	00000	00041
00066		O	MC10	00017	00000	00506
00067		O	MC13	00020	00000	00515
00070		O	MC1	00021	00000	00047
00071		O	MC2	00022	00000	00100
00072		O	MC3	00023	00000	00127
00073		O	MC14	00024	00000	00525
00074		O	MC15	00025	00000	00533
00075		O	MC4	00026	00000	00206
00076		O	MC5	00027	00000	00236
00077		O	MC6	00030	00000	00266
00100		O	MC16	00031	00000	00541
00101		O	MC17	00032	00000	00551
00102		O	MC7	00033	00000	00346
00103		O	MC8	00034	00000	00376
00104		O	MC9	00035	00000	00426
00105		O	MC18	00036	00000	00561
00106		O	MC19	00037	00000	00567
00107		O	MC20	00040	00000	00577
00110	MC0	CLEAR	16D*M1	00041	70100	00020
				00042	16030	63500
00111		CL	w(M11)	00043	16030	02124
00112		RJP	U(IC)	00044	65020	63426
00113		U-TAG	FR11A*I01	00045	02021	01337
00114		JP	MCQQ	00046	61000	00014
00115	MC1	RJP	U(IC)	00047	65020	63426
00116		U-TAG	S02*0	00050	01343	00000
00117		RJP	U(IC)	00051	65020	63426
00120		U-TAG	S51*I02	00052	01345	01347
00121		RJP	U(IC)	00053	65020	63426
00122		U-TAG	S03*I03	00054	01351	01353
00123		ENT	A*W(TYME)	00055	11030	63141
00124		STR	A*W(NULLY)	00056	15030	63532
00125		ENT	Q*W(ZZ22)	00057	10030	01274
00126		LSH	Q*1	00060	05000	00001
00127		MUL	2660266000	00061	22030	02126
00130		STR	A*W(ZZ2)	00062	15030	01267
00131		CL	w(M1)	00063	16030	63500
00132		ENT	Q*W(ZZ2)	00064	10030	01267
00133		ENT	A*W(ZZ1)	00065	11030	01266
00134		RJP	FIXZERO	00066	65000	01074
00135		RSH	A*1	00067	02000	00001
00136		LSH	A*1	00070	06000	00001
00137		CL	w(M2)	00071	16030	63501
00140		STR	A*W(KAT)	00072	15030	63523
00141		STR	Q*W(KAL)	00073	14030	63524
00142		STR	Q*W(M2)	00074	14030	63501
00143	MCQ3	RJP	U(IC)	00075	65020	63426
00144		U-TAG	FR14*I01	00076	02027	01337
00145		JP	MCQQ	00077	61000	00014
00146	MC2	RJP	U(IC)	00100	65020	63426
00147		U-TAG	S04*0	00101	01355	00000
00150		RJP	U(IC)	00102	65020	63426
00151		U-TAG	S51*I02	00103	01345	01347
00152		RJP	U(IC)	00104	65020	63426
00153		U-TAG	S03*I03	00105	01351	01353
00154		ENT	A*W(TYME)	00106	11030	63141
						ARC LENGTH (ZZ2)

• 00155	STR A*W(NULLY)	00107	15030	63532
• 00156	ENT Q*W(ZZ22)	00110	10030	01274
• 00157	LSH Q*1	00111	05000	00001
• 00160	MUL 2660266000	00112	22030	02126
• 00161	STR A*W(ZZ2)	00113	15030	01267
• 00162	CL W(M1)	00114	16030	63500
• 00163	ENT Q*W(ZZ2)	00115	10030	01267
• 00164	ENT A*W(ZZ1)	00116	11030	01266
• 00165	RJP FIXZERO	00117	65000	01074
• 00166	RSH A*1	00120	02000	00001
• 00167	LSH A*1	00121	06000	00001
• 00170	CL W(M3)	00122	16030	63502
• 00171	STR A*W(KET)	00123	15030	63521
• 00172	STR Q*W(KEL)	00124	14030	63522
• 00173	STR Q*W(M3)	00125	14030	63502
• 00174	JP MCQ3	00126	61000	00075
• 00175 MC3	RJP U(IC)	00127	65020	63426
• 00176	U-TAG S14*I0	00130	01367	00000
• 00177	RJP U(IC)	00131	65020	63426
• 00200	U-TAG S52*I14	00132	01371	01373 LENGTH 221
• 00201	RJP U(IC)	00133	65020	63426
• 00202	U-TAG S15*I15	00134	01375	01377 NUM LINES Z22
• 00203	RJP U(IC)	00135	65020	63426
• 00204	U-TAG S16*I16	00136	01401	01403 LINE SPACING Z23
• 00205	RJP U(IC)	00137	65020	63426
• 00206	U-TAG S17*I17	00140	01405	01407 TIME/LINE Z24
• 00207	RJP U(IC)	00141	65020	63426
• 00210	U-TAG S18*I18	00142	01411	01413 AXIS 0 OP 1 Z25
• 00211	ENT A*W(TYME)	00143	11030	63141
• 00212	STR A*W(NULLY)	00144	15030	63532
• 00213	ENT Q*W(ZZ1)	00145	10030	01273
• 00214	MUL 2660266000	00146	22030	02126
• 00215	STR A*W(ZZ1)	00147	15030	01266
• 00216	ENT Q*W(ZZ3)	00150	10030	01275
• 00217	MUL 2660266000	00151	22030	02126
• 00220	STR A*W(ZZ3)	00152	15030	01270
• 00221	ENT A*W(ZZ3)*ANOT	00153	11530	01270
• 00222	ENT A*44400	00154	11000	44400 BEAMWIDTH
• 00223	STR A*W(ZZ3)	00155	15030	01270
• 00224	ENT Q*W(ZZ1)	00156	10030	01266
• 00225	ENT A*W(ZZ44)	00157	11030	01276
• 00226	RJP FIXZERO	00160	65000	01074
• 00227	STR A*W(ZZ4)	00161	15030	01271
• 00230	ENT Q*W(ZZ2)	00162	10030	01267
• 00231	MUL W(ZZ4)	00163	22030	01271
• 00232	ADD Q*1	00164	26000	00001
• 00233	RSH Q*1	00165	01000	00001
• 00234	NO-OP	00166	12000	00000
• 00235	LSH Q*1	00167	05000	00001
• 00236	CL W(M1)	00170	16030	63500
• 00237	STR Q*W(AEBOX)	00171	14030	01277 TOTAL TIME
• 00240	ENT A*W(ZZ1)	00172	11030	01266
• 00241	STR A*W(AEBOX+1)	00173	15030	01300 ARC
• 00242	ENT A*W(ZZ2)	00174	11030	01267
J0243	STR A*W(AEBOX+2)	00175	15030	01301 NUM LINES
• 00244	ENT A*W(ZZ3)	00176	11030	01270
• 00245	STR A*W(AEBOX+3)	00177	15030	01302 SPA LINES
• 00246	ENT A*W(ZZ4)	00200	11030	01271
• 00247	STR A*W(AEBOX+4)	00201	15030	01303 TIME LINE

• 00250	ENT A*W(ZZ5)	00202	11030 01272	
• 00251	STR A*W(M8)	00203	15030 63507	ROTATE OR NOT
• 00252	RPL Y+1*W(M1)	00204	36030 63500	
• 00253	JP MCQ3	00205	61000 00075	
• J0254 MC4	CL W(M7)	00206	16030 63506	
• 00255	RJP U(IC)	00207	65020 63426	
• 00256	U-TAG S06*0	00210	01357 00000	
• J0257	RJP U(IC)	00211	65020 63426	
• J0260	U-TAG S51*I02	00212	01345 01347	
• 00261	RJP U(IC)	00213	65020 63426	
• 00262	U-TAG S03*I03	00214	01351 01353	ARC LENGTH (ZZ2)
• 00263	ENT A*W(TYME)	00215	11030 63141	
• 00264	STR A*W(NULL)	00216	15030 63531	
• 00265	ENT Q*W(ZZ22)	00217	10030 01274	
• 00266	LSH Q*1	00220	05000 00001	
• 00267	MUL 2660266000	00221	22030 02126	
• 00270	STR A*W(ZZ2)	00222	15030 01267	
• 00271	CL W(M4)	00223	16030 63503	
• 00272	ENT Q*W(ZZ2)	00224	10030 01267	
• 00273	ENT A*W(ZZ1)	00225	11030 01266	
• J0274	RJP FIXZERO	00226	65000 01074	
• J0275	RSH A*1	00227	02000 00001	
• 00276	LSH A*1	00230	06000 00001	
• 00277	CL W(M5)	00231	16030 63504	
• 00300	STR A*W(KRT)	00232	15030 63527	
• 00301	STR Q*W(KRL)	00233	14030 63530	
• 00302	STR Q*W(M5)	00234	14030 63504	
• 00303	JP MCQ3	00235	61000 00075	
• 00304 MC5	CL W(M7)	00236	16030 63506	
• 00305	RJP U(IC)	00237	65020 63426	
• 00306	U-TAG S08*0	00240	01361 00000	
• 00307	RJP U(IC)	00241	65020 63426	
• 00310	U-TAG S51*I02	00242	01345 01347	
• 00311	RJP U(IC)	00243	65020 63426	
• 00312	U-TAG S03*I03	00244	01351 01353	ARC LENGTH (ZZ2)
• 00313	ENT A*W(TYME)	00245	11030 63141	
• 00314	STR A*W(NULL)	00246	15030 63531	
• 00315	ENT Q*W(ZZ22)	00247	10030 01274	
• 00316	LSH Q*1	00250	05000 00001	
• 00317	MUL 2660266000	00251	22030 02126	
• 00320	STR A*W(ZZ2)	00252	15030 01267	
• 00321	CL W(M4)	00253	16030 63503	
• 00322	ENT Q*W(ZZ2)	00254	10030 01267	
• 00323	ENT A*W(ZZ1)	00255	11030 01266	
• 00324	RJP FIXZERO	00256	65000 01074	
• 00325	RSH A*1	00257	02000 00001	
• 00326	LSH A*1	00260	06000 00001	
• 00327	CL W(M6)	00261	16030 63505	
• 00330	STR A*W(KDT)	00262	15030 63525	
• 00331	STR Q*W(KDL)	00263	14030 63526	
• 00332	STR Q*W(M6)	00264	14030 63505	
• 00333	JP MCQ3	00265	61000 00075	
• 00334 MC6	RJP U(IC)	00266	65020 63426	
• 00335	U-TAG S24*0	00267	01415 00000	
• 00336	RJP U(IC)	00270	65020 63426	
• 00337	U-TAG S52*I14	00271	01371 01373	LENGTH 221
• 00340	RJP U(IC)	00272	65020 63426	
• 00341	U-TAG S15*I15	00273	01375 01377	NUM LINES ZZZ
• 00342	RJP U(IC)	00274	65020 63426	

00343	U-TAG	S16*I16	00275	01401	01403	LINE SPACING	223
00344	RJP	U(IC)	00276	65020	63426		
00345	U-TAG	S17*I17	00277	01405	01407	TIME/LINE	224
00346	RJP	U(IC)	00300	65020	63426		
00347	U-TAG	S28*I18	00301	01417	01413	AXIS 0 OR 1	225
00350	ENT	A*W(TYME)	00302	11030	63141		
00351	STR	A*W(NULL)	00303	15030	63531		
00352	ENT	Q*W(ZZ11)	00304	10030	01273		
00353	MUL	2660266000	00305	22030	02126		
00354	STR	A*W(ZZ1)	00306	15030	01266		
00355	ENT	Q*W(ZZ33)	00307	10030	01275		
00356	MUL	2660266000	00310	22030	02126		
00357	STR	A*W(ZZ3)	00311	15030	01270		
00360	CL	W(M7)	00312	16030	63506		
00361	ENT	A*W(ZZ3)*ANOT	00313	11530	01270		
00362	ENT	A*0000044400	00314	11000	44400	BEAMWIDTH	
00363	STR	A*W(ZZ3)	00315	15030	01270		
00364	ENT	Q*W(ZZ1)	00316	10030	01266		
00365	ENT	A*W(ZZ44)	00317	11030	01276		
00366	RJP	FIXZERO	00320	65000	01074		
00367	STR	A*W(ZZ4)	00321	15030	01271		
00370	ENT	Q*W(ZZ2)	00322	10030	01267		
00371	MUL	W(ZZ4)	00323	22030	01271		
00372	ADD	Q*1	00324	26000	00001		
00373	RSH	Q*1	00325	01000	00001		
00374	NO-OP		00326	12000	00000		
00375	LSH	Q*1	00327	05000	00001		
00376	CL	W(M4)	00330	16030	63503		
00377	STR	Q*W(RDBOX)	00331	14030	01311	TOTAL TIME	
00400	ENT	A*W(ZZ1)	00332	11030	01266		
00401	STR	A*W(RDBOX+1)	00333	15030	01312	ARC	
00402	ENT	A*W(ZZ2)	00334	11030	01267		
00403	STR	A*W(RDBOX+2)	00335	15030	01313	NUM LINES	
00404	ENT	A*W(ZZ3)	00336	11030	01270		
00405	STR	A*W(RDBOX+3)	00337	15030	01314	SPA LINES	
00406	ENT	A*W(ZZ4)	00340	11030	01271		
00407	STR	A*W(RDBOX+4)	00341	15030	01315	TIME LINE	
00410	ENT	A*W(ZZ5)	00342	11030	01272		
00411	STR	A*W(M9)	00343	15030	63510	ROTATE OR NOT	
00412	RPL	Y+1*W(M4)	00344	36030	63503		
00413	JP	MCQ3	00345	61000	00075		
00414	RJP	U(IC)	00346	65020	63426		
MC7	U-TAG	S10*I0	00347	01363	00000		
00416	RJP	U(IC)	00350	65020	63426		
00417	U-TAG	S51*I02	00351	01345	01347		
00420	RJP	U(IC)	00352	65020	63426		
00421	U-TAG	S03*I03	00353	01351	01353	ARC LENGTH (ZZ2)	
00422	ENT	A*W(TYME)	00354	11030	63141		
00423	STR	A*W(NULLY)	00355	15030	63532		
00424	ENT	Q*W(ZZ22)	00356	10030	01274		
00425	LSH	Q*1	00357	05000	00001		
00426	MUL	2660266000	00360	22030	02126		
00427	STR	A*W(ZZ2)	00361	15030	01267		
00430	CL	W(M1)	00362	16030	63500		
00431	ENT	Q*W(ZZ2)	00363	10030	01267		
00432	ENT	A*W(ZZ1)	00364	11030	01266		
00433	RJP	FIXZERO	00365	65000	01074		
00434	RSH	A*1	00366	02000	00001		
00435	LSH	A*1	00367	06000	00001		

• 00436	CL W(M2)	00370	16030	63501
• 00437	STR A*W(KAT)	00371	15030	63523
• 00440	STR Q*W(KAL)	00372	14030	63524
• 00441	STR Q*W(M2)	00373	14030	63501
• 00442	STR Q*W(M7)	00374	14030	63506
• 00443	JP MCQ3	00375	61000	00075
• 00444 MC8	RJP U(IC)	00376	65020	63426
• 00445	U-TAG S12*0	00377	01365	00000
• 00446	RJP U(IC)	00400	65020	63426
• 00447	U-TAG S51*I02	00401	01345	01347
• 00450	RJP U(IC)	00402	65020	63426
• 00451	U-TAG S03*I03	00403	01351	01353
• 00452	ENT A*W(TYME)	00404	11030	63141
• 00453	STR A*W(NULLY)	00405	15030	63532
• 00454	ENT Q*W(ZZ22)	00406	10030	01274
• 00455	LSH Q*1	00407	05000	00001
• 00456	MUL 2660266000	00410	22030	02126
• 00457	STR A*W(ZZ2)	00411	15030	01267
• 00460	CL W(M1)	00412	16030	63500
• 00461	ENT Q*W(ZZ2)	00413	10030	01267
• 00462	ENT A*W(ZZ1)	00414	11030	01266
• 00463	RJP FIXZERO	00415	65000	01074
• 00464	RSH A*1	00416	02000	00001
• 00465	LSH A*1	00417	06000	00001
• 00466	CL W(M3)	00420	16030	63502
• 00467	STR A*W(KET)	00421	15030	63521
• 00470	STR Q*W(KEL)	00422	14030	63522
• 00471	STR Q*W(M3)	00423	14030	63502
• 00472	STR Q*W(M7)	00424	14030	63506
• 00473	JP MCQ3	00425	61000	00075
• 00474 MC9	RJP U(IC)	00426	65020	63426
• 00475	U-TAG S34*0	00427	01421	00000
• 00476	RJP U(IC)	00430	65020	63426
• 00477	U-TAG S52*I14	00431	01371	01373
• 00500	RJP U(IC)	00432	65020	63426
• 00501	U-TAG S15*I15	00433	01375	01377
• 00502	RJP U(IC)	00434	65020	63426
• 00503	U-TAG S16*I16	00435	01401	01403
• 00504	RJP U(IC)	00436	65020	63426
• 00505	U-TAG S17*I17	00437	01405	01407
• 00506	RJP U(IC)	00440	65020	63426
• 00507	U-TAG S38*I18	00441	01423	01413
• 00510	ENT A*W(TYME)	00442	11030	63141
• 00511	STR A*W(NULLY)	00443	15030	63532
• 00512	ENT Q*W(ZZ11)	00444	10030	01273
• 00513	MUL 2660266000	00445	22030	02126
• 00514	STR A*W(ZZ1)	00446	15030	01266
• 00515	ENT Q*W(ZZ33)	00447	10030	01275
• 00516	MUL 2660266000	00450	22030	02126
• 00517	STR A*W(ZZ3)	00451	15030	01270
• 00520	ENT A*W(ZZ3)*ANOT	00452	11530	01270
• 00521	ENT A*44400	00453	11000	44400
• 00522	STR A*W(ZZ3)	00454	15030	01270
• 00523	ENT Q*W(ZZ1)	00455	10030	01266
• 00524	ENT A*W(ZZ4)	00456	11030	01276
• 00525	RJP FIXZERO	00457	65000	01074
• 00526	STR A*W(ZZ4)	00460	15030	01271
• 00527	ENT Q*W(ZZ2)	00461	10030	01267
• 00530	MUL W(ZZ4)	00462	22030	01271

ARC LENGTH (ZZ2)

LENGTH 221

NUM LINES ZZZ

LINE SPACING ZZZ

TIME/LINE ZZZ

AXIS 0 OR 1 ZZZ

BEAMWIDTH

00531	ADD Q*1	00463	26000	00001
00532	RSH Q*1	00464	01000	00001
00533	NO=0P	00465	12000	00000
00534	LSH Q*1	00466	05000	00001
00535	CL W(M1)	00467	16030	63500
00536	STR Q*W(AEBOX)	00470	14030	01277 TOTAL TIME
00537	ENT A*W(ZZ1)	00471	11030	01266
00540	STR A*W(AEBOX+1)	00472	15030	01300 ARC
00541	ENT A*W(ZZ2)	00473	11030	01267
00542	STR A*W(AEBOX+2)	00474	15030	01301 NUM LINES
00543	ENT A*W(ZZ3)	00475	11030	01270
00544	STR A*W(AEBOX+3)	00476	15030	01302 SPA LINES
00545	ENT A*W(ZZ4)	00477	11030	01271
00546	STR A*W(AEBOX+4)	00500	15030	01303 TIME LINE
00547	ENT A*W(ZZ5)	00501	11030	01272
00550	STR A*W(M8)	00502	15030	63507
00551	RPL Y+1*W(M1)	00503	36030	63500
00552	RPL Y+1*W(M7)	00504	36030	63506
00553	JP MC03	00505	61000	00075
00554 MC10	ENT A*W(TYME)	00506	11030	63141
00555	SUB A#7	00507	21000	00007
00556	STR A*W(TOME)	00510	15030	63520
00557	CL CPW(M10)	00511	16070	63511
00560	RJP U(IC)	00512	65020	63426
00561	U-TAG FR12*I01	00513	02023	01337
00562	JP MCQQ	00514	61000	00014
00563 MC13	CL W(M10)	00515	16030	63511
00564	ENT Q*W(TYME)	00516	10030	63141
00565	SUB Q*W(TOME)	00517	27030	63520
00566	RPL Y+Q*W(NULL)	00520	34030	63531
00567	RPL Y+Q*W(NULLY)	00521	34030	63532
00570	RJP U(IC)	00522	65020	63426
00571	U-TAG FR13*I01	00523	02025	01337
00572	JP MCQQ	00524	61000	00014
00573 MC14	RJP U(IC)	00525	65020	63426
00574	U-TAG AZZY1*I03	00526	01705	01353
00575	ENT Q*W(ZZ22)	00527	10030	01274
00576	MUL 2660266000	00530	22030	02126
00577	STR A*W(KKAL)	00531	15030	63512
00600	JP MCXX	00532	61000	00574
00601 MC15	RJP U(IC)	00533	65020	63426
00602	U-TAG AZZY4*I03	00534	01707	01353
00603	ENT Q*W(ZZ22)	00535	10030	01274
00604	MUL 2660266000	00536	22030	02126
00605	STR A*W(KKEL)	00537	15030	63513
00606	JP MCXX	00540	61000	00574
00607 MC16	RJP U(IC)	00541	65020	63426
00610	U-TAG AZZY5*I03	00542	01711	01353
00611	ENT Q*W(ZZ22)	00543	10030	01274
00612	MUL 2660266000	00544	22030	02126
00613	STR A*W(KKRL)	00545	15030	63514
00614	BSK B0*W(DRIFTFLAG)	00546	71030	02121
00615	JP MC17	00547	61000	00551
00616	JP MCXX	00550	61000	00574
00617 MC17	RJP U(IC)	00551	65020	63426
00620	U-TAG AZZY6*I03	00552	01713	01353
00621	ENT Q*W(ZZ22)	00553	10030	01274
00622	MUL 2660266000	00554	22030	02126
00623	STR A*W(KKDL)	00555	15030	63515

• 00624	BSK B0*W(DRIFTFLAG)	00556	71030	02121
• 00625	JP MC20A	00557	61000	00602
• 00626	JP MCXX	00560	61000	00574
• 00627 MC18	RJP U(IC)	00561	65020	63426
• 00630	U-TAG AZZY7*I03	00562	01715	01353
• 00631	ENT Q*W(ZZ22)	00563	10030	01274
• 00632	MUL 2660266000	00564	22030	02126
• 00633	STR A*W(KKCL)	00565	15030	63516
• 00634	JP MCXX	00566	61000	00574
• 00635 MC19	RJP U(IC)	00567	65020	63426
• 00636	U-TAG AZZY8*I03	00570	01717	01353
• 00637	ENT Q*W(ZZ22)	00571	10030	01274
• 00640	MUL 2660266000	00572	22030	02126
• 00641	STR A*W(KKLL)	00573	15030	63517
• 00642 MCXX	RJP U(IC)	00574	65020	63426
• 00643	U-TAG FR15*I01	00575	02031	01337
• 00644	JP MCQQ	00576	61000	00014
• 00645 MC20	CL CPL(DRIFTFLAG)	00577	16050	02121
• 00646	CL W(M11)	00600	16030	02124
• 00647	JP MC16	00601	61000	00541
• 00650 MC20A	CL W(DRIFTFLAG)	00602	16030	02121
• 00651	RJP U(IC)	00603	65020	63426
• 00652	U-TAG PCOUT1*PCIN1	00604	02103	02115
• 00653	SIL	00605	64000	00000
• 00654	PUT W(AZ1)*W(DRFTAZ)	00606	10030	63053
• 00655	PUT W(EL1)*W(DRFTEL)	00607	14030	02122
• 00656	CL CPL(M11)	00610	10030	63054
• 00657	RIL	00611	14030	02123
• 00660 MCPC	RJP U(IC)	00612	16050	02124
• 00661	U-TAG FR26*I01	00613	60000	00000
• 00662	JP MCQQ	00614	65020	63426
• 00663 SCAN2Q	BSK B0*W(M11)	00615	02074	01337
• 00664	ENT A*W(DRFTAZ)*SKIP	00616	61000	00014
• 00665	ENT A*W(AZ1)	00617	71030	02124
• 00666	ADD A*W(KKAL)	00620	11130	02122
• 00667	STR A*W(AZ2)	00621	11030	63053
• 00668	BSK B0*W(M11)	00622	20030	63512
• 00669	ENT A*W(DRFTEL)*SKIP	00623	15030	63055
• 00670	ENT A*W(EL1)	00624	71030	02124
• 00671	ENT A*W(KKEL)	00625	11130	02123
• 00672	STR A*W(EL2)	00626	11030	63054
• 00673	ENT Q*W(KKCL)	00627	20030	63513
• 00674	MUL W(ANS)	00630	15030	63056
• 00675	LSH AQ*1	00631	10030	63516
• 00676	RPL A+Y*W(EL2)	00632	22030	63066
• 00677	ENT Q*W(KKCL)	00633	07000	00001
• 00700	MUL W(ANC)	00634	24030	63056
• 00701	LSH AQ*1	00635	10030	63517
• 00702	RPL A+Y*W(EL2)	00636	22030	63070
• 00703	ENT Q*W(KKCL)	00637	07000	00001
• 00704	MUL W(ANS)	00640	24030	63056
• 00705	LSH AQ*1	00641	10030	63516
• 00706	RPL A+Y*W(EL2)	00642	22030	63070
• 00707	ENT Q*W(KKCL)	00643	07000	00001
• 00710	MUL W(ANS)	00644	24030	63055
• 00711	LSH AQ*1	00645	10030	63517
• 00712	RPL A+Y*W(AZ2)	00646	22030	63066
• 00713	ENT Q*W(KKLL)	00647	03000	00035
• 00714	RSH AQ*29D	00650	35030	63055
	RPL Y-Q*W(AZ2)			

• 00715	CL	W(FFF)	00651	16030	02117
• 00716	CL	W(FFFF)	00652	16030	02120
• 00717	ENT	Q*W(TYME)	00653	10030	63141
• 00720	ENT	A*W(M10)*AZERO	00654	11430	63511
• 00721	ENT	Q*W(TOME)	00655	10030	63520
• 00722	SUB	Q*W(NULLY)	00656	27030	63532
• 00723	STR	Q*W(TT)	00657	14030	00002
• 00724	ENT	A*W(M1)*ANOT	00660	11530	63500
• 00725	JP	P5	00661	61000	00700 (ROX SCAN)
• 00726	MOVE	6*AEBOX*BOX	00662	12700	00005
			00663	10037	01277
			00664	14037	01323
			00665	72700	00663
• 00727	RJP	D0B0X	00666	65000	01144
• 00730	ENT	Q*W(BOXOUT1)	00667	10030	01335
• 00731	ENT	A*W(M8)*AZERO	00670	11430	63507
• 00732	STR	Q*W(FFFF)*SKIP	00671	14130	02120
• 00733	STR	Q*W(FFF)	00672	14030	02117
• 00734	ENT	A*W(M8)	00673	11030	63507
• 00735	ENT	Q*W(BOXOUT2)*AZERO	00674	10430	01336
• 00736	STR	Q*W(FFF)*SKIP	00675	14130	02117
• 00737	STR	Q*W(FFFF)	00676	14030	02120
• 00740	JP	P2	00677	61000	00714
• 00741 P5	ENT	A*W(M2)*ANOT	00700	11530	63501
• 00742	JP	P7	00701	61000	00706
• 00743	ENT	A*W(KAT)	00702	11030	63523
• 00744	ENT	Q*W(KAL)	00703	10030	63524
• 00745	RJP	BKANDFORTH	00704	65000	01044
• J0746	STR	Q*W(FFF)	00705	14030	02117
• 00747 P7	ENT	A*W(M3)*ANOT	00706	11530	63502
• 00750	JP	P2	00707	61000	00714
• 00751	ENT	A**W(KET)	00710	11030	63521
• 00752	ENT	Q*W(KEL)	00711	10030	63522
• 00753	RJP	BKANDFORTH	00712	65000	01044
• 00754	STR	Q*W(FFFF)	00713	14030	02120
• 00755 P2	ENT	A**W(M7)*ANOT	00714	11530	63506
• 00756	JP	PPUT	00715	61000	00743
• 00757	ENT	Q*W(FFF)	00716	10030	02117
• 00760	MUL	W(LANS)	00717	22030	63066
• 00761	LSH	AQ*1	00720	07000	00001
• 00762	STR	A*W(TEMP)	00721	15030	01031
• 00763	ENT	Q*W(FFFF)	00722	10030	02120
• 00764	MUL	W(LANC)	00723	22030	63070
• 00765	LSH	AQ*1	00724	07000	00001
• 00766	ADD	A*W(TEMP)	00725	20030	01031
• 00767	STR	A*W(TEMP1)	00726	15030	01032
• 00770	ENT	Q*W(FFFF)	00727	10030	02120
• 00771	MUL	W(LANS)	00730	22030	63066
• 00772	LSH	AQ*1	00731	07000	00001
• 00773	STR	A*W(TEMP)	00732	15030	01031
• 00774	ENT	Q*W(FFF)	00733	10030	02117
• 00775	MUL	W(LANC)	00734	22030	63070
• 00776	LSH	AQ*1	00735	07000	00001
• 00777	SUB	A*W(TEMP)	00736	21030	01031
• 01000	RPL	A+Y*W(AZ2)	00737	24030	63055
• 01001	ENT	A*W(TEMP1)	00740	11030	01032
• 01002	RPL	A+Y*W(EL2)	00741	24030	63056
• 01003	JP	P6	00742	61000	00747
• 01004 PPUT	ENT	A*W(FFF)	00743	11030	02117

01005	RPL	A+Y*W(AZ2)	00744	24030	63055
01006	ENT	A*W(FFFF)	00745	11030	02120
01007	RPL	A+Y*W(EL2)	00746	24030	63056
01010 Pb	ENT	A*W(EL2)	00747	11030	63056
01011	SUB	A*0200000000*ANEG	00750	21730	02127
01012	CL	A	00751	11000	00000
01013	ADD	A*0202660266*APOS	00752	20630	02130
01014	CL	A	00753	11000	00000
01015	SUB	A*0002660266	00754	21030	02131
01016	STR	A*W(EL2)	00755	15030	63056
01017 SCAN2	JP	0	00756	61000	00000
01020	JP	SCAN2Q	00757	61000	00617
01021 SCAN1	JP	0	00760	61000	00000
01022	ENT	A*W(RA1)	00761	11030	63002
01023	ADD	A*W(KKRL)	00762	20030	63514
01024	STR	A*W(RA2)	00763	15030	63004
01025	ENT	A*W(DN1)	00764	11030	63003
01026	ADD	A*W(KKDL)	00765	20030	63515
01027	STR	A*W(DN2)	00766	15030	63005
01030	ENT	Q*W(TYME)	00767	10030	63141
01031	ENT	A*W(M10)*AZERO	00770	11430	63511
01032	ENT	Q*W(TOME)	00771	10030	63520
01033	SUB	Q*W(NULL)	00772	27030	63531
01034	STR	Q*W(TT)	00773	14030	00002
01035	ENT	A*W(M4)*ANOT	00774	11530	63503
01036	JP	P4	00775	61000	01014 (BX SCAN)
01037	MOVE	6*RDBOX*BOX	00776	12700	00005
			00777	10037	01311
			01000	14037	01323
			01001	72700	00777
01040	RJP	D0B0X	01002	65000	01144
01041	ENT	Q*W(BOXOUT1)	01003	10030	01335
01042	ENT	A*W(M9)*AZERO	01004	11430	63510
01043	RPL	Y+Q*W(DN2)*SKIP	01005	34130	63005
01044	RPL	Y+Q*W(RA2)	01006	34030	63004
01045	ENT	A*W(M9)	01007	11030	63510
01046	ENT	Q*W(BOXOUT2)*AZERO	01010	10430	01336
01047	RPL	Y+Q*W(RA2)*SKIP	01011	34130	63004
01050	RPL	Y+Q*W(DN2)	01012	34030	63005
01051	JP	SCAN1	01013	61000	00760
01052 P4	ENT	A*W(M5)*ANOT	01014	11530	63504
01053	JP	P3	01015	61000	01022 (ASC SCAN)
01054	ENT	A*W(KRT)	01016	11030	63527
01055	ENT	Q*W(KRL)	01017	10030	63530
01056	RJP	BKANDFORTH	01020	65000	01044
01057	RPL	Y+Q*W(RA2)	01021	34030	63004
01060 P3	ENT	A*W(M6)*ANOT	01022	11530	63505
01061	JP	SCAN1	01023	61000	00760
01062	ENT	A*W(KDT)	01024	11030	63525
01063	ENT	Q*W(KDL)	01025	10030	63526
01064	RJP	BKANDFORTH	01026	65000	01044
01065	RPL	Y+Q*W(DN2)	01027	34030	63005
01066	JP	SCAN1	01030	61000	00760
01067 TEMP	0	0	01031	00000	00000
01070 TEMP1	0	0	01032	00000	00000
01071 T	0		01033	00000	00000
01072 T0	0		01034	00000	00000
01073 T1	0		01035	00000	00000
01074 T2	0		01036	00000	00000

01075	T3	0	01037	00000 00000
01076	T4	0	01040	00000 00000
01077	T5	0	01041	00000 00000
01100	T6	0	01042	00000 00000
01101	L	0	01043	00000 00000
01102	BKANDFORTH	JP 0	01044	61000 00000
01103		STR Q*W(L)	01045	14030 01043
01104		RSH Q*1	01046	01000 00001
01105		STR Q*W(T3)	01047	14030 01037
01106		STR A*W(T2)	01050	15030 01036
01107		RSH A*1	01051	02000 00001
01110		STR A*W(T0)	01052	15030 01034
01111		ENT A*W(TT)	01053	11030 00002
01112		RSH AQ*30D	01054	03000 00036
01113		DIV W(T2)	01055	23030 01036
01114		SUB A*W(T0)*APOS	01056	21630 01034
01115		JP P10	01057	61000 01066
01116		STR A*W(T)	01060	15030 01033
01117		RJP LINE	01061	65000 01212
01120		SUB A*W(T3)	01062	21030 01037
01121		CP A	01063	15040 00000
01122		ENT Q*A	01064	10070 00000
01123		JP BKANDFORTH	01065	61000 01044
01124	P10	ADD A*W(T0)	01066	20030 01034
01125		STR A*W(T)	01067	15030 01033
01126		RJP LINE	01070	65000 01212
01127		SUB A*W(T3)	01071	21030 01037
01130		ENT Q*A	01072	10070 00000
01131		JP BKANDFORTH	01073	61000 01044
01132	FIXZERO	JP 0	01074	61000 00000
01133		STR A*W(PYRD)	01075	15030 01132
01134		STR Q*W(AYRD)	01076	14030 01131
01135		ENT A*2	01077	11000 00002
01136		SUB Q*0001330133*QPOS	01100	27630 02132
01137		JP KYRD	01101	61000 01116
01140		ADD A*2	01102	20000 00002
01141		SUB Q*0004210421*QPOS	01103	27630 02133
01142		JP KYRD	01104	61000 01116
01143		ADD A*2	01105	20000 00002
01144		SUB Q*0007070707*QPOS	01106	27630 02134
01145		JP KYRD	01107	61000 01116
01146		MUL 2525252525	01110	22030 02135
01147		LSH A*1	01111	06000 00001
01150		ADD A*0021042104	01112	20030 02136
01151		RSH AQ*30D	01113	03000 00036
01152		DIV 0001330133	01114	23030 02132
01153		STR Q*A	01115	14040 00000 P=2/3L+12
01154	KYRD	COM A*W(PYRD)*YLESS	01116	04630 01132
01155		JP FYRD	01117	61000 01126
01156		SUB A*W(PYRD)*ANOT	01120	21530 01132
01157		JP FYRD	01121	61000 01126
01160		ADD A*W(PYRD)	01122	20030 01132
01161		STR A*W(PYRD)	01123	15030 01132
01162		RJP U(IC)	01124	65020 63426
01163		U-TAG TYRD*0	01125	01133 00000
01164	FYRD	ENT A*W(PYRD)	01126	11030 01132
01165		ENT Q*W(AYRD)	01127	10030 01131
01166		JP FIXZERO	01130	61000 01074
01167	AYRD	O O	01131	00000 00000

01170	PYRD	0	0	01132	00000 00000
01171	TYRD	FD	1*A	01133	06050 50505
01172		0	LYRD	01134	00000 01137
01173		FU	1*D	01135	11050 50505
01174		-0	PYRD	01136	77777 01132
01175	LYRD	FD	0*PERIOD ADJUSTED TO	01137	25122 71624
				01140	11050 61117
				01141	32303 11211
				01142	05312 40000
01176		-0	-0	01143	77777 77777
01177	DOBXA	JP	0	01144	61000 00000
01200		ENT	A*W(TT)	01145	11030 00002
01201		RSH	AQ*3D	01146	03000 00036
01202		DIV	W(BOX)	01147	23030 01323
01203		CL	Q	01150	10000 00000
01204		STR	A*W(TT)	01151	15030 00002
01205		SUB	A*W(BOX+4)*ANEG	01152	21730 01327
01206		ADD	Q*1\$SKIP	01153	26100 00001
01207		ADD	A*W(BOX+4)*SKIP	01154	20130 01327
01210		JP	S-3	01155	61000 01152
01211		STR	Q*W(T4)	01156	14030 01040
01212		SUB	Q*W(BOX+2)*QNEG	01157	27730 01325
					Q HAS NUM LINES-1 A HAS REM, T IME
01213		JP	DOBOX1	01160	61000 01200
01214		ENT	A*W(BOX+4)	01161	11030 01327
01215		LSH	A*1	01162	06000 00001
01216		ENT	Q*W(BOX+1)	01163	10030 01324
01217		RJP	BKANDFURTH	01164	65000 01044
01220		STR	Q*W(BOXOUT1)	01165	14030 01335
01221		ENT	Q*W(BOX+2)	01166	10030 01325
01222		SUB	Q*1	01167	27000 00001
01223		MUL	W(BOX+3)	01170	22030 01326
01224		RSH	Q*1	01171	01000 00001
01225		STR	Q*W(T5)	01172	14030 01041
01226		ENT	Q*W(T4)	01173	10030 01040
01227		MUL	W(BOX+3)	01174	22030 01326
01230		SUB	Q*W(T5)	01175	27030 01041
01231		STR	Q*W(BOXOUT2)	01176	14030 01336
01232		JP	DOBOX	01177	61000 01144
01233	DOBX1	ENT	A*W(BOX+1)	01200	11030 01324
01234		RSH	A*1	01201	02000 00001
01235		CP	A	01202	15040 00000
01236		STR	A*W(BOXOUT1)	01203	15030 01335
01237		ENT	Q*W(BOX+2)	01204	10030 01325
01240		SUB	Q*1	01205	27000 00001
01241		MUL	W(BOX+3)	01206	22030 01326
01242		CP	A	01207	15040 00000
01243		STR	A*W(BOXOUT2)	01210	15030 01336
01244		JP	DOBOX	01211	61000 01144
01245	LINE	JP	0	01212	61000 00000
01246		ENT	A*W(T0)	01213	11030 01034
01247		RSH	A*1	01214	02000 00001
01250		SUB	A*W(T)*APOS	01215	21630 01033
01251		JP	LINE1	01216	61000 01221
01252		RJP	LINEX	01217	65000 01230
01253		JP	LINE	01220	61000 01212
01254	LINE1	ENT	A*W(T0)	01221	11030 01034
01255		SUB	A*W(T)	01222	21030 01033
01256		STR	A*W(T)	01223	15030 01033

• 01257	RJP	LINEX	01224	65000	01230
• 01260	CP	A	01225	15040	00000
• 01261	ADD	A*W(L)	01226	20030	01043
• 01262	JP	LINE	01227	61000	01212
• 01263 LINEX	JP	0	01230	61000	00000
• 01264	ENT	Q*W(T0)	01231	10030	01034
• 01265	SUB	Q*6*QPOS	01232	27600	00006
• 01266	JP	LINE2	01233	61000	01243
• 01267	ADD	Q*3	01234	26000	00003
• 01270	MUL	6	01235	22000	00006
• 01271	STR	Q*W(T6)	01236	14030	01042
• 01272	ENT	A*W(L)	01237	11030	01043
• 01273	RSH	AQ*30D	01240	03000	00036
• 01274	DIV	W(T6)	01241	23030	01042
• 01275	JP	LINE3	01242	61000	01250
• 01276 LINE2	ENT	Q*W(L)	01243	10030	01043
• 01277	MUL	2	01244	22000	00002
• 01300	DIV	W(T0)	01245	23030	01034
• 01301	CL	A	01246	11000	00000
• 01302	DIV	W(T0)	01247	23030	01034
• 01303 LINES	STR	Q*W(S)	01250	14030	01265
• 01304	ENT	Q*W(T)	01251	10030	01033
• 01305	MUL	W(T)	01252	22030	01033
• 01306	SUB	Q*5*QNEG	01253	27700	00005
• 01307	ENT	Q*W(T)*SKIP	01254	10130	01033
• 01310	ADD	Q*14D*SKIP	01255	26100	00016
• 01311	MUL	6	01256	22000	00006
• 01312	SUB	Q*9D	01257	27000	00011
• 01313 LINE4	MUL	W(S)	01260	22030	01265
• 01314	STR	Q*A	01261	14040	00000
• 01315	JP	LINEX	01262	61000	01230
• 01316 KIND	0	0	01263	00000	00000
• 01317 ENDTIM	0	0	01264	00000	00000
• 01320 S	0	0	01265	00000	00000
• 01321 ZZ1	0	0	01266	00000	00000
• 01322 ZZ2	0	0	01267	00000	00000
• 01323 ZZ3	0	0	01270	00000	00000
• 01324 ZZ4	0	0	01271	00000	00000
• 01325 ZZ5	0	0	01272	00000	00000
• 01326 ZZ11	0		01273	00000	00000
• 01327 ZZ22	0		01274	00000	00000
• 01330 ZZ33	0		01275	00000	00000
• 01331 ZZ44	0		01276	00000	00000
• 01332 AEBOX	RESERVE	10D	01277	00000	00000
• 01333 RDBOX	RESERVE	10D	01311	00000	00000
• 01334 BOX	RESERVE	10D	01323	00000	00000
• 01335 RXOUT1	0	0	01335	00000	00000
• 01336 BOXOUT2	0	0	01336	00000	00000
• 01337 I01	FD	1*D	01337	11050	50505
• 01340	10	KIND	01340	00010	01263
• 01341	0	0	01341	00000	00000
• 01342	0	18D	01342	00000	00022
• 01343 S02	FD	1*A	01343	06050	50505
• 01344	-0	A03	01344	77777	01451
• 01345 S51	FD	1*A	01345	06050	50505
• 01346	77777	A04	01346	77777	01454
• 01347 I02	FD	1*D	01347	11050	50505
• 01350	0	ZZ1	01350	00000	01266
• 01351 S03	FD	1*A	01351	06050	50505

01352	77777	A05	01352	77777	01460
01353 I03	FD	1*X20	01353	35622	40505
01354	O	ZZ22	01354	00000	01274
01355 S04	FD	1*A	01355	06050	50505
01356	-0	A06	01356	77777	01465
01357 S06	FD	1*A	01357	06050	50505
01360	-0	A07	01360	77777	01470
01361 S08	FD	1*A	01361	06050	50505
01362	-0	A08	01362	77777	01473
01363 S10	FD	1*A	01363	06050	50505
01364	-0	A09	01364	77777	01476
01365 S12	FD	1*A	01365	06050	50505
01366	-0	A10	01366	77777	01502
01367 S14	FD	1*A	01367	06050	50505
01370	-0	A11	01370	77777	01506
01371 S52	FD	1*A	01371	06050	50505
01372	77777	FR1	01372	77777	01721
01373 I14	FD	1*X20	01373	35622	40505
01374	O	ZZ11	01374	00000	01273
01375 S15	FD	1*A	01375	06050	50505
01376	77777	A12	01376	77777	01512
01377 I15	FD	1*D	01377	11050	50505
01400	O	ZZ2	01400	00000	01267
01401 S16	FD	1*A	01401	06050	50505
01402	77777	A13	01402	77777	01516
01403 I16	FD	1*X20	01403	35622	40505
01404	O	ZZ33	01404	00000	01275
01405 S17	FD	1*A	01405	06050	50505
01406	77777	A14	01406	77777	01522
01407 I17	FD	1*D	01407	11050	50505
01410	O	ZZ44	01410	00000	01276
01411 S18	FD	1*A	01411	06050	50505
01412	77777	A15	01412	77777	01526
01413 I18	FD	1*D	01413	11050	50505
01414	O	ZZ5	01414	00000	01272
01415 S24	FD	1*A	01415	06050	50505
01416	-0	A16	01416	77777	01535
01417 S28	FD	1*A	01417	06050	50505
01420	77777	A17	01420	77777	01541
01421 S34	FD	1*A	01421	06050	50505
01422	-0	A18	01422	77777	01550
01423 S38	FD	1*A	01423	06050	50505
01424	77777	A19	01424	77777	01554
01425 S40	FD	1*A	01425	06050	50505
01426	77777	A20	01426	77777	01566
01427 S41	FD	1*A	01427	06050	50505
01430	77777	A21	01430	77777	01572
01431 S42	FD	1*A	01431	06050	50505
01432	77777	A22	01432	77777	01575
01433 S43	FD	1*A	01433	06050	50505
01434	77777	A23	01434	77777	01602
01435 S44	FD	1*A	01435	06050	50505
01436	77777	A24	01436	77777	01610
01437 S61	FD	1*A	01437	06050	50505
01440	-0	A20	01440	77777	01566
01441 S62	FD	1*A	01441	06050	50505
01442	-0	A21	01442	77777	01572
01443 S63	FD	1*A	01443	06050	50505
01444	-0	A22	01444	77777	01575

.	01445 S64	FD 1*A	01445 06050 50505
.	01446	-0 A23	01446 77777 01602
.	01447 S65	FD 1*A	01447 06050 50505
.	01450	-0 A24	01450 77777 01610
.	01451 A03	FD 0*AZ SCAN	01451 06370 53010
.	01452	77777 77777	01452 06230 00000
.	01453 A04	FD 0*PERIOD IN SEC =	01453 77777 77777
.	01454	77777 77777	01454 25122 71624
.	01455 A05	FD 0*HALF-ARC IN DEGREES	01455 11051 62305
.	01456	77777 77777	01456 30121 00544
.	01457 A06	FD 0*EL SCAN	01457 77777 77777
.	01458	77777 77777	01460 15062 11341
.	01459 A07	FD 0*RA SCAN	01461 06271 00516
.	01460	77777 77777	01462 23051 11214
.	01461 A08	FD 0*DEC SCAN	01463 27121 23000
.	01462	77777 77777	01464 77777 77777
.	01463 A09	FD 0*ACROSS SCAN	01465 12210 53010
.	01464	77777 77777	01466 06230 00000
.	01465 A10	FD 0*ALONG SCAN	01467 77777 77777
.	01466	77777 77777	01470 27060 53010
.	01467 A11	FD 0*AE BOX SCAN	01471 06230 00000
.	01468	77777 77777	01472 77777 77777
.	01469 A12	FD 0*LINES PER BOX =	01473 11121 00530
.	01470	77777 77777	01474 10062 30000
.	01471 A13	FD 0*SPACING IN DEG=	01475 77777 77777
.	01472	77777 77777	01476 06102 72430
.	01473 A14	FD 0*TIME/LINE(SEC)=	01477 30053 01006
.	01474	77777 77777	01478 01500 23000
.	01475 A15	FD 0*LINES PARALLEL TO AZ(0),EL(1)	01479 77777 77777
.	01476	77777 77777	01480 01502 06212
.	01477 A16	FD 0*RA-DEC BOX SCAN	01481 42314 23000
.	01478	77777 77777	01482 01503 05053
.	01479 A17	FD 0*EL-DEC BOX SCAN	01483 01006 05053
.	01480	77777 77777	01484 01504 23000
.	01481 A18	FD 0*AZ-DEC BOX SCAN	01485 01505 77777
.	01482	77777 77777	01486 01506 06120
.	01483 A19	FD 0*AZ-EL BOX SCAN	01487 01507 35053
.	01484	77777 77777	01488 01508 01006
.	01485 A20	FD 0*EL-RA BOX SCAN	01489 01509 01504
.	01486	77777 77777	01490 01510 23000
.	01487 A21	FD 0*AZ-EL BOX SCAN	01491 01511 01505
.	01488	77777 77777	01492 01512 77777
.	01489 A22	FD 0*EL-RA BOX SCAN	01493 01513 21162
.	01490	77777 77777	01494 01514 31230
.	01491 A23	FD 0*AZ-EL BOX SCAN	01495 01515 05251
.	01492	77777 77777	01496 01516 07243
.	01493 A24	FD 0*EL-RA BOX SCAN	01497 01517 22705
.	01494	77777 77777	01498 01518 50544
.	01495 A25	FD 0*AZ-EL BOX SCAN	01499 01519 01515
.	01496	77777 77777	01500 01520 77777
.	01497 A26	FD 0*EL-RA BOX SCAN	01501 01521 21162
.	01498	77777 77777	01502 01522 31230
.	01499 A27	FD 0*AZ-EL BOX SCAN	01503 01523 05251
.	01500	77777 77777	01504 01524 21162
.	01501 A28	FD 0*EL-RA BOX SCAN	01505 01525 30121
.	01502	77777 77777	01506 01526 04044
.	01503 A29	FD 0*AZ-EL BOX SCAN	01507 01527 05111
.	01504	77777 77777	01508 01528 23000
.	01505 A30	FD 0*EL-RA BOX SCAN	01509 01529 01521
.	01506	77777 77777	01510 01530 21243
.	01507 A31	FD 0*AZ-EL BOX SCAN	01511 01531 31230
.	01508	77777 77777	01512 01532 05250
.	01509 A32	FD 0*EL-RA BOX SCAN	01513 01533 21251
.	01510	77777 77777	01514 01534 30121
.	01511 A33	FD 0*AZ-EL BOX SCAN	01515 01535 04044
.	01512	77777 77777	01516 01536 21162
.	01513 A34	FD 0*EL-RA BOX SCAN	01517 01537 31230
.	01514	77777 77777	01518 01538 05250
.	01515 A35	FD 0*AZ-EL BOX SCAN	01519 01539 23000
.	01516	77777 77777	01520 01540 01511
.	01517 A36	FD 0*EL-RA BOX SCAN	01521 01541 21243
.	01518	77777 77777	01522 01542 31230
.	01519 A37	FD 0*AZ-EL BOX SCAN	01523 01543 05250
.	01520	77777 77777	01524 01544 21251
.	01521 A38	FD 0*EL-RA BOX SCAN	01525 01545 30121
.	01522	77777 77777	01526 01546 04044
.	01523 A39	FD 0*AZ-EL BOX SCAN	01527 01547 21162
.	01524	77777 77777	01528 01548 31230
.	01525 A40	FD 0*EL-RA BOX SCAN	01529 01549 05250
.	01526	77777 77777	01530 01550 23000
.	01527 A41	FD 0*AZ-EL BOX SCAN	01531 01551 01521
.	01528	77777 77777	01532 01552 21243
.	01529 A42	FD 0*EL-RA BOX SCAN	01533 01553 31230
.	01530	77777 77777	01534 01554 05250
.	01531 A43	FD 0*AZ-EL BOX SCAN	01535 01555 21251
.	01532	77777 77777	01536 01556 30121
.	01533 A44	FD 0*EL-RA BOX SCAN	01537 01557 04044
.	01534	77777 77777	01538 01558 21162
.	01535 A45	FD 0*AZ-EL BOX SCAN	01539 01559 31230
.	01536	77777 77777	01540 01560 05250
.	01537 A46	FD 0*EL-RA BOX SCAN	01541 01561 23000

• 01504	77777	77777		01540	77777	77777
• 01505 A17	FD	0*LINES PARALLEL TO RA(0),DFC(1)		01541	21162	31230
				01542	05250	62706
				01543	21211	22105
				01544	31240	52706
				01545	51244	05611
				01546	12105	16140
• 01506	77777	77777		01547	77777	77777
• 01507 A18	FD	0*AL-ACR BOX SCAN		01550	06214	10610
				01551	27050	72435
• 01510	77777	77777		01552	05301	00623
• 01511 A19	FD	0*LINES PARALLEL TO ORBIT(0),ACROSS ORBIT(1)		01553	77777	77777
				01554	21162	31230
				01555	05250	62706
				01556	21211	22105
				01557	31240	52427
				01560	07163	15124
				01561	40560	61027
				01562	24303	00524
				01563	27071	63151
				01564	61400	00000
• 01512	77777	77777		01565	77777	77777
• 01513 A20	FD	0*SCANS CLEARED		01566	30100	62330
				01567	05102	11206
• 01514	77777	77777		01570	27121	10000
• 01515 A21	FD	0*SCANS HELD		01571	77777	77777
• 01516	77777	77777		01572	30100	62330
• 01517 A22	FD	0*SCANS SET TO END		01573	05151	22111
				01574	77777	77777
• 01520	77777	77777		01575	30100	62330
• 01521 A23	FD	0*SCANS SET TO OTHER END		01576	05301	23105
				01577	31240	51223
				01600	11000	00000
				01601	77777	77777
				01602	30100	62330
				01603	05301	23105
				01604	31240	52431
				01605	15122	70512
				01606	23110	00000
• 01522	77777	77777		01607	77777	77777
• 01523 A24	FD	0*SCANS RELEASED		01610	30100	62330
				01611	05271	22112
				01612	06301	21100
• 01524	77777	77777		01613	77777	77777
• 01525 AZZY2	FD	1*A		01614	06050	50505
• 01526	-0	PYT2		01615	77777	01621
• 01527 PYT1	FD	0*AZ OFFSET		01616	06370	52413
				01617	13301	23100
• 01530	-0	-0		01620	77777	77777
• 01531 PYT2	FD	0*OFFSET IN DEGREES		01621	24131	33012
				01622	31051	62305
				01623	11121	42712
				01624	12300	00000
• 01532	-0	-0		01625	77777	77777
• 01533 PYT3	FD	0*EL OFFSET		01626	12210	52413
				01627	13301	23100
• 01534	-0	-0		01630	77777	77777
• 01535 PYT4	FD	0*RA OFFSET		01631	27060	52413

.	01536	-0		01632	13301	23100
.	01537 PYT5	FD	0*DEC OFFSET	01633	77777	77777
.	01540	-0		01634	11121	00524
.	01541 PYT6	FD	0*ACROSS OFFSET	01635	13133	01231
.	01542	-0		01636	77777	77777
.	01543 PYT7	FD	0*ALONGS OFFSET	01637	06102	72430
.	01544	-0		01640	30052	41313
.	01545 FR16	FD	0*CLEARED-RESELECT AT WILL	01641	30123	10000
.	01546	-0		01642	77777	77777
.	01547 FR17	FD	0*HELD-RESELECT AT WILL	01643	06212	42314
.	01550	-0		01644	30052	41313
.	01551 FR17A	FD	0*RESUMED-RESELECT AT WILL	01645	30123	10000
.	01552	-0		01646	77777	77777
.	01553 FR18	FD	0*SCANNING-RESELECT AT WILL	01647	10211	20627
.	01554	-0		01650	12114	12712
.	01555 FR19	FD	0*OFFSET-RESELECT AT WILL	01651	30122	11210
.	01556	-0		01652	31050	63105
.	01557 AZZY1	FD	1*A	01653	34162	12100
.	01560	-0	FR20	01654	77777	77777
.	01561 AZZY4	FD	1*A	01655	15122	11141
.	01562	-0	FR21	01656	27123	01221
.	01563 AZZY5	FD	1*A	01657	12103	10506
.	01564	-0	FR22	01660	31053	41621
.	01565 AZZY6	FD	1*A	01661	21000	00000
.	01566	-0	FR23	01662	77777	77777
.	01567 AZZY7	FD	1*A	01663	27123	03222
.	01570	-0	FR24	01664	12114	12712
.	01571 AZZY8	FD	1*A	01665	30122	11210
.	01572	-0	FR25	01666	31050	63105
.	01573 FR1	FD	0*ARC IN DEGREES	01667	34162	12100
.	01574	-0		01670	77777	77777
.				01671	30100	62323
.				01672	16231	44127
.				01673	12301	22112
.				01674	10310	50631
.				01675	05341	62121
.				01676	77777	77777
.				01677	24131	33012
.				01700	31412	71230
.				01701	12211	21031
.				01702	05063	10534
.				01703	16212	10000
.				01704	77777	77777
.				01705	06050	50505
.				01706	77777	02033
.				01707	06050	50505
.				01710	77777	02040
.				01711	06050	50505
.				01712	77777	02045
.				01713	06050	50505
.				01714	77777	02052
.				01715	06050	50505
.				01716	77777	02060
.				01717	06050	50505
.				01720	77777	02066
.				01721	06271	00516
.				01722	23051	11214
.				01723	27121	23000
.				01724	77777	77777

• 01575 FR2	FD 0*SELECT SCAN OR OFFSET	01725 30122 11210 01726 31053 01006 01727 23052 42705 01730 24131 33012 01731 31000 00000 01732 00000 00403 01733 10211 20627 01734 51244 05615 01735 24211 15161 01736 40562 71230 01737 32221 25162 01740 40000 00000 01741 00000 00403 01742 06373 01006 01743 23516 34056 01744 12213 01006 01745 23516 44056 01746 06371 22107 01747 24355 16540 01750 56063 72413 01751 13301 23151 01752 66405 61221 01753 24131 33012 01754 31516 74000 01755 00000 00403 01756 27063 01006 01757 23517 04056 01760 11121 03010 01761 06235 17140 01762 56270 61112 01763 10072 43551 01764 61244 05627 01765 06241 31330 01766 12315 16161 01767 40561 11210 01770 24131 33012 01771 31516 16240 01772 00000 00403 01773 24270 71631 01774 41051 02724 01775 30301 00623 01776 51616 34056 01777 06212 42314 02000 30100 62351 02001 61644 05607 02002 24355 16165 02003 40561 02724 02004 30302 41313 02005 30123 15161 02006 66405 60621 02007 24231 42413 02010 13301 23151 02011 61674 00000 02012 00000 00403 02013 11271 61331 02014 05301 00623 02015 51617 04000 02016 77777 77777
• 01576	403	
• 01577 FR3	FD 0*CLEAR(0), HOLD(1), RESUME(2)	
• 01600	403	
• 01601 FR4	FD 6*AZSCAN(3), ELSCAN(4), AZELBOX(5)	
• 01602	FD 0*, AZOFFSET(6), ELOFFSET(7)	
• 01603	403	
• 01604 FR5	FD 6*RASCAN(8), DECSCAN(9), RADECBOX(10)	
• 01605	FD 0*10), RAOFFSET(11), DECOFFSET(12)	
• 01606	403	
• 01607 FR6	FD 6*ORBIT-CROSSCAN(13), ALONGSCAN(14)	
• 01610	FD 0*14), BOX(15), CROSSOFFSET(16), ALONG02001 OFFSET(17)	
• 01611	403	
• 01612	FD 0*DRIFT SCAN(18)	
• 01613	-0	

• 01614	JOHNO	FD	1*A	02017	06050	50505
• 01615		-0	FR2	02020	77777	01725
• 01616	FR11A	FD	1*A	02021	06050	50505
• 01617		-0	FR16	02022	77777	01647
• 01620	FR12	FD	1*A	02023	06050	50505
• 01621		-0	FR17	02024	77777	01655
• 01622	FR13	FD	1*A	02025	06050	50505
• 01623		-0	FR17A	02026	77777	01663
• 01624	FR14	FD	1*A	02027	06050	50505
• 01625		-0	FR18	02030	77777	01671
• 01626	FR15	FD	1*A	02031	06050	50505
• 01627		-0	FR19	02032	77777	01677
• 01630	FR20	FD	0*AZ OFFSET IN DEGREES	02033	06370	52413
				02034	13301	23105
				02035	16230	51112
• 01631		-0		02036	14271	21230
• 01632	FR21	FD	0*EL OFFSET IN DEGREES	02037	77777	77777
				02040	12210	52413
				02041	13301	23105
				02042	16230	51112
• 01633		-0		02043	14271	21230
• 01634	FR22	FD	0*RA OFFSET IN DEGREES	02044	77777	77777
				02045	27060	52413
				02046	13301	23105
				02047	16230	51112
• 01635		-0		02050	14271	21230
• 01636	FR23	FD	0*DEC OFFSET IN DEGREES	02051	77777	77777
				02052	11121	00524
				02053	13133	01231
				02054	05162	30511
				02055	12142	71212
				02056	30000	00000
• 01637		-0		02057	77777	77777
• 01640	FR24	FD	0*CROSS-ORBIT OFFSET (DEG)	02060	10272	43030
				02061	41242	70716
				02062	31052	41313
				02063	30123	10551
				02064	11121	44000
• 01641		-0		02065	77777	77777
• 01642	FR25	FD	0*ALONG-ORBIT OFFSET (DEG)	02066	06212	42314
				02067	41242	70716
				02070	31052	41313
				02071	30123	10551
				02072	11121	44000
• 01643		-0		02073	77777	77777
• 01644	FR26	FD	1*A	02074	06050	50505
• 01645		0	FR27	02075	00000	02100
• 01646		FD	1*A	02076	06050	50505
• 01647		-0	FR18+2	02077	77777	01673
• 01650	FR27	FD	2*DRIPTING-R	02100	11271	61331
				02101	16231	44127
• 01651		-0		02102	77777	77777
• 01652	PCOUT1	FD	0*A	02103	06000	00000
• 01653		-0	PMSG1	02104	77777	02105
• 01654	PMSG1	FD	0*CARRIAGE RETURN TO START DRIFT SC02105	10062	72716	
		AN		02106	06141	20527
				02107	12313	22723
				02110	05312	40530

01655	-0		02111	31062	73105
01656 PCIN1	FD	1*D	02112	11271	61331
01657	0	\$+1	02113	05301	00623
01660 FFF	0	0	02114	77777	77777
01661 FFFF	0	0	02115	11050	50505
01662 DRIFTFLAG	0		02116	00000	02117
01663 DRFTAZ	0		02117	00000	00000
01664 DRFTEL	0		02120	00000	00000
01665 M11	0		02121	00000	00000
01666	RESERVE	1	02122	00000	00000
			02123	00000	00000
			02124	00000	00000
			02125	00000	00000
			02126	26602	66000
			02127	02000	00000
			02130	02026	60266
			02131	00026	60266
			02132	00013	30133
			02133	00042	10421
			02134	00070	70707
			02135	25252	52525
			02136	00210	42104

SPURT OUTPUT NO. 111

CROWTHER#4APR66

SCAN					
LABEL	LOC	LABEL	LOC	LABEL	LOC
A\$#####1111	02126	A\$#####1112	00663	A\$#####1113	02127
A\$#####1114	02130	A\$#####1115	02131	A\$#####1116	00777
A\$#####1117	02132	A\$#####1118	02133	A\$#####1119	02134
A\$#####111A	02135	A\$#####111B	02136	A03	01451
A04	01454	A05	01460	A06	01465
A07	01470	A08	01473	A09	01476
A10	01502	A11	01506	A12	01512
A13	01516	A14	01522	A15	01526
A16	01535	A17	01541	A18	01550
A19	01554	A20	01566	A21	01572
A22	01575	A23	01602	A24	01610
ACOAZIM	63071	ACQELEV	63075	ACQUI	63427
ACTUALTIME	63142	ADSCN	63416	AEBOX	01277
AEBOXLINES	63507	AESCN	63417	ALNGOFFSET	63517
ALNGACRSCN	63506	ANC	63070	ANS	63066
ARCOFAZIM	63524	ARCOFDEC	63526	ARCOFELEV	63522
ARCUFRA	63530	ASTRODEC	63106	ASTRORA	63105
AUPEREQUAT	63341	AUTOSWITCH	63025	AUTOT	63437
AYRD	01131	AZ1	63053	AZ2	63055
AZDIFS	63120	AZELOTIME	63532	AZELBXSCAN	63500
AZELINDS	63162	AZIM	63053	AZIMOFFSET	63512
AZIMOUT	64000	AZIMOVER	63325	AZIMADD	63442
AZIMERRORS	63027	AZIMIN	75000	AZMTHSCAN	63501
AZTRACKERR	63022	AZZY1	01705	AZZY2	01614
AZZY4	01707	AZZY5	01711	AZZY6	01713
AZZY7	01715	AZZY8	01717	BODYSIZE	63462
BOX	01323	BOXOUT1	01335	BOXOUT2	01336
BKANDFORTH	01044	BLASTOFF	63146	COCON	63414
CONVERTIME	63135	CORCT	63420	COSORIENT	63065
COSAZEL	63070	CAZIM	63060	CELBODY	63113
CELCOMPGM	63424	CELEV	63061	CELTIME	63133
CHCOR	63422	CHPAR	63431	CRANGE	63057
CRSSOFFSET	63516	DOBOX	01144	DOROX1	01200
DOPPOUT	66000	DOPPADD	63444	DATANALYZE	63425
DAY	63150	DEC	63003	DECOFFSET	63515
DECDDT	63010	DECLINSCAN	63505	DELTATEE	63316
DN1	63003	DN2	63005	DRFTAZ	02122
DRFTEL	02123	DRIFTFLAG	02121	DSECONDS	63141
DUMSECTTG	63154	DYDMP	63421	EL1	63054
EL2	63056	ELOIFS	63121	ELEV	63054
ELEVOFFSET	63513	ELEVOUT	65000	ELEVADO	63443
ELEVERRORS	63030	ELEVIN	76000	ELTRACKERR	63023
ELVTNSCAN	63502	ENDTIM	01264	EQUATOR	63323
ESTSHIFTED	63143	EXPNAME	63350	FFF	02117
FFFF	02120	FIRSTELEV	63104	FIRSTHTRU	63153
FIXZERO	01074	FLATTENING	63337	FR1	01721
FR11A	02021	FR12	02023	FR13	02025
FR14	02027	FR15	02031	FR16	01647
FR17	01655	FR17A	01663	FR18	01671
FR19	01677	FR2	01725	FR20	02033
FR21	02040	FR22	02045	FR23	02052
FR24	02060	FR25	02066	FR26	02074

FR27	02100	FR3	01733	FR4	01742
FR5	01756	FR6	01773	FRAMESIZE	63101
FREQUENCY	63317	FYRD	01126	GEOCENLAT	63322
GEODETLAT	63321	GMTMODU24	63145	GMTSHIFTED	63144
HOLDNUHOLD	63511	HOURMINUTE	63137	HOURREG	63151
HEIGHT	63326	I01	01337	I02	01347
I03	01353	I14	01373	I15	01377
I16	01403	I17	01407	I18	01413
IC	63426	ID10RADIO	66777	ID11RADIO	67776
ID12RADIO	67777	ID13RADIO	70775	ID14RADIO	70776
ID15RADIO	71776	ID16RADIO	71777	ID17RADIO	72776
ID18RADIO	72777	ID19RADIO	73776	ID1CELCOR	63000
ID1ENTPNT	63410	ID1RADCOR	63050	ID1RADIO	63440
ID1RECRD	63210	ID1SYSENT	77576	ID1SYSNAM	77676
ID1SYSPAR	63310	ID1TIME	63130	ID20RADIO	73777
ID21RADIO	74776	ID22RADIO	74777	ID23RADIO	75776
ID24RADIO	75777	ID25RADIO	76775	ID26RADIO	76776
ID2CELCOR	63001	ID2ENTPNT	63411	ID2RADCOR	63051
ID2RADIO	63441	ID2RECRD	63211	ID2SYSENT	77577
ID2SYSNAM	77677	ID2SYSPAR	63311	ID2TIME	63131
ID3RADIO	63776	ID4RADIO	63777	ID5RADIO	64776
ID6RADIO	64777	ID7RADIO	65776	ID8RADIO	65777
ID9RADIO	66776	INAZIMADD	63446	INELEVADD	63447
INTER	63413	INTERAZIM	72000	INTERCOM	63426
INTERUOPP	74000	INTERELEV	73000	INTERLCKSW	63460
INTERRANGE	76777	JOHND	02017	JPTAB	00016
KAL	63524	KAT	63523	KDL	63526
KUT	63525	KEL	63522	KET	63521
KINU	01263	KKAL	63512	KKCL	63516
KKDL	63515	KKEL	63513	KKLL	63517
KKRL	63514	KMPERNM	63342	KRL	63530
KRT	63527	KYBRDLEVEL	63110	KYBRDSPFC1	63344
KYBRDSPEC2	63345	KYBRDSPEC3	63346	KYBRDSPEC4	63347
KYRD	01116	L	01043	LONGITUDF	63320
LINE	01212	LINE1	01221	LINE2	01243
LINE3	01250	LINE4	01260	LINECOUNT\$	63127
LINEX	01230	LSPERAU	63336	LYRO	01137
MUONSW\$	63343	MODESWITCH	63024	M1	63500
M10	63511	M11	02124	M2	63501
M3	63502	M4	63503	M5	63504
M6	63505	M7	63506	M8	63507
M9	63510	MAINSWITCH	63334	MCO	00041
MC1	00047	MC10	00506	MC13	00515
MC14	00525	MC15	00533	MC16	00541
MC17	00551	MC18	00561	MC19	00567
MC2	00100	MC20	00577	MC20A	00602
MC3	00127	MC4	00206	MC5	00236
MC6	00266	MC7	00346	MC8	00376
MC9	00426	MCPC	00614	MCPFILLER	71000
MCPGM	63412	MCQ3	00075	MCQQ	00014
MCR	00012	MCXX	00574	MILLSTNADD	63451
MINREG	63152	MSFREQ	63332	NMPERAU	63340
NULL	63531	NULLY	63532	POLE	63324
P10	01066	P2	00714	P3	01022
P4	01014	P5	00700	P6	00747
P7	00706	PCOUT1	02103	PCIN1	02115
PER10DAZIM	63523	PERI0DDEC	63525	PERIODELEV	63521
PER10DRA	63527	PL0TAZIM\$\$	63020	PL0TELEV\$\$	63021
PL0TP	63436	PLANP	63434	PMSG1	02105

PPUT	00743	PREVIOUSTM	63461	PR1NRECSW	63160
PRLG	63423	PYRD	01132	PYT1	01616
PYT2	01621	PYT3	01626	PYT4	01631
PYT5	01634	PYT6	01637	PYT7	01643
RA	63002	RAOFFSET	63514	RA1	63002
RA2	63004	RADOT	63007	RADARMODE	63312
RADC8XSCAN	63503	RADECOTIME	63531	RAD10DEC	63541
RADIOMETER	63102	RAD10RA	63540	RADINDIC	63157
RADIUS	63006	RAD1USDOT	63011	RANGE	63052
RANGEOUT	70777	RANGEADD	63445	RANGEDOT	63062
RASCTNSCAN	63504	RD0TDIFS	63123	RDBOX	01311
RD80XLINES	63510	RDIFS	63122	RDMTR	63430
RDXXX	63433	RECORDSIZE	63112	RECAZIM	67000
RECELEV	70000	RECFILE	63212	RECRD	63415
RECRDSWTC	63155	REFRACIND\$	63161	RELEASESW	63156
S	01265	S02	01343	S03	01351
S04	01355	S06	01357	S08	01361
S10	01363	S12	01365	S14	01367
S15	01375	S16	01401	S17	01405
S18	01411	S24	01415	S28	01417
S34	01421	S38	01423	S40	01425
S41	01427	S42	01431	S43	01433
S44	01435	S51	01345	S52	01371
S61	01437	S62	01441	S63	01443
S64	01445	S65	01447	SAZ1M	63055
SCAN	00003	SCAN1	00760	SCAN2	00756
SCAN2Q	00617	SCANX	00000	SCELT1ME	63134
SUEC	63005	SECONDS	63140	SELEV	63056
S1DERT1ME	63012	SINORIENT	63064	S1NAZEL	63066
SKIP	63331	SLAVE	63126	SLAVEOPTS	63124
SLAVEMODES	63125	SRA	63004	SRADTIME	63136
SYNCTIMING	63542	SYS.COMREG1	63452	SYS.COMREG2	63453
SYS.COMREG3	63454	SYS.COMREG4	63455	SYS.COMREG5	63456
SYS.COMREG6	63457	SYSENTRIES	77600	SYSNAMES	77700
SYSTAT1	63313	SYSTAT2	63314	SYSTATO	63315
T	01033	TO	01034	TOME	63520
T1	01035	T2	01036	T3	01037
T4	01040	T5	01041	T6	01042
TEMP	01031	TEMP1	01032	T1MECORR	63107
TIMEMODE	63103	TIMEP	63435	TIMETOHOLD	63520
TRACKINDIC	63026	TRUERANGE	63063	TRUETIME	63132
TT	00002	TTYSTATUS	63111	TWOSECDOP	63017
TYME	63141	TYRD	01133	VELOFLIGHT	63335
V1ZDEC1	63014	V1ZDEC2	63016	VIZRA1	63013
VIZRA2	63015	WFORD	63432	WFADD	63450
WFREQ	63333	YEARMONTH	63147	YRTRAN	63327
ZRTRAN	63330	ZZ1	01266	ZZ11	01273
ZZ2	01267	ZZ2	01274	ZZ3	01270
ZZ3	01275	ZZ4	01271	ZZ44	01276
ZZ5	01272				

SPURT OUTPUT NO. 112

CROWTHER*4APR66

LABEL	LOC	LABEL	LOC	LABEL	LOC
SCANX	00000	TT	00002	SCAN	00003
MCR	00012	MCQQ	00014	JPTAB	00016
MC0	00041	MC1	00047	MCQ3	00075
MC2	00100	MC3	00127	MC4	00206
MC5	00236	MC6	00266	MC7	00346
MC8	00376	MC9	00426	MC10	00506
MC13	00515	MC14	00525	MC15	00533
MC16	00541	MC17	00551	MC18	00561
MC19	00567	MCXX	00574	MC20	00577
MC20A	00602	MCPC	00614	SCAN20	00617
A\$\$\$\$\$1112	00663	P5	00700	P7	00706
P2	00714	PPUT	00743	P6	00747
SCAN2	00756	SCAN1	00760	A\$\$\$\$\$1116	00777
P4	01014	P3	01022	TEMP	01031
TEMP1	01032	T	01033	T0	01034
T1	01035	T2	01036	T3	01037
T4	01040	T5	01041	T6	01042
L	01043	BKANDFORTH	01044	P10	01066
FIXZERO	01074	KYRD	01116	FYRD	01126
AYRD	01131	PYRD	01132	TYRD	01133
LYRD	01137	DOROX	01144	DOROX1	01200
LINE	01212	LINE1	01221	LINEX	01230
LINE2	01243	LINE3	01250	LINE4	01260
KIND	01263	ENDTIM	01264	S	01265
ZZ1	01266	ZZ2	01267	ZZ3	01270
ZZ4	01271	ZZ5	01272	ZZ11	01273
ZZ22	01274	ZZ33	01275	ZZ44	01276
ACBOX	01277	ROB0X	01311	BOX	01323
H0XOUT1	01335	BOXOUT2	01336	I01	01337
S02	01343	S51	01345	I02	01347
S03	01351	I03	01353	S04	01355
S06	01357	S08	01361	S10	01363
S12	01365	S14	01367	S52	01371
I14	01373	S15	01375	I15	01377
S16	01401	I16	01403	S17	01405
I17	01407	S18	01411	I18	01413
S24	01415	S28	01417	S34	01421
S38	01423	S40	01425	S41	01427
S42	01431	S43	01433	S44	01435
S61	01437	S62	01441	S63	01443
S64	01445	S65	01447	A03	01451
A04	01454	A05	01460	A06	01465
A07	01470	A08	01473	A09	01476
A10	01502	A11	01506	A12	01512
A13	01516	A14	01522	A15	01526
A16	01535	A17	01541	A18	01550
A19	01554	A20	01566	A21	01572
A22	01575	A23	01602	A24	01610
A22Y2	01614	PYT1	01616	PYT2	01621
PYT3	01626	PYT4	01631	PYT5	01634
PYT6	01637	PYT7	01643	FR16	01647
FR17	01655	FR17A	01663	FR18	01671

FR19	01677	AZZY1	01705	AZZY4	01707
AZZY5	01711	AZZY6	01713	AZZY7	01715
AZZY8	01717	FR1	01721	FR2	01725
FR3	01733	FR4	01742	FR5	01756
FR6	01773	JOHND	02017	FR11A	02021
FR12	02023	FR13	02025	FR14	02027
FR15	02031	FR20	02033	FR21	02040
FH22	02045	FR23	02052	FR24	02060
FR25	02066	FR26	02074	FR27	02100
PCOUT1	02103	PMSG1	02105	PCIN1	02115
FFF	02117	FFFF	02120	DRIFTFLAG	02121
DRFTAZ	02122	DRFTEL	02123	M11	02124
A\$\$\$\$\$1111	02126	A\$\$\$\$\$1113	02127	A\$\$\$\$\$1114	02130
A\$\$\$\$\$1115	02131	A\$\$\$\$\$1117	02132	A\$\$\$\$\$1118	02133
A\$\$\$\$\$1119	02134	A\$\$\$\$\$111A	02135	A\$\$\$\$\$111B	02136
ID1CELCOR	63000	ID2CELCOR	63001	RA1	63002
RA	63002	DN1	63003	DEC	63003
SRA	63004	RA2	63004	SDEC	63005
DN2	63005	RADIUS	63006	RADOT	63007
DEC0DT	63010	RADIUSDOT	63011	SIDERTIME	63012
VIZRA1	63013	VIZDEC1	63014	VIZRA2	63015
VIZDEC2	63016	TWOSECDOP	63017	PL0TAZIM\$	63020
PL0TELEV\$	63021	AZTRACKERR	63022	ELTRACKERR	63023
MODESWITCH	63024	AUTOSWITCH	63025	TRACKINDIC	63026
AZIMERROR\$	63027	ELEVERRORS	63030	ID1RADCOR	63050
ID2RADCOR	63051	RANGE	63052	AZIM	63053
AZ1	63053	ELEV	63054	EL1	63054
SAZIM	63055	AZ2	63055	SELEV	63056
EL2	63056	C RANGE	63057	CAZIM	63060
CELEV	63061	RANGEDOT	63062	TRUE RANGE	63063
SINORIENT	63064	COSORIENT	63065	ANS	63066
SINAZEL	63066	ANC	63070	COSAZEL	63070
ACQAZIM	63071	ACQELEV	63075	FRAMESIZE	63101
RADIOMETER	63102	TIMEMODE	63103	FIRSTELEV	63104
ASTRORA	63105	ASTRODEC	63106	TIMECORR	63107
KYBRDLEVEL	63110	TTYSTATUS	63111	RECORDSIZE	63112
CELBODY	63113	AZDIFS	63120	ELDIFS	63121
RDIFS	63122	RD0TDIFS	63123	SLAVEOPTS	63124
SLAVEMODES	63125	SLAVE	63126	LINECOUNT\$	63127
ID1TIME	63130	ID2TIME	63131	TRUETIME	63132
SELTIME	63133	SCLETIME	63134	CONVERTIME	63135
SRACTIME	63136	HOURMINUTE	63137	SECONDS	63140
TYME	63141	DSECONDS	63141	ACTUALTIME	63142
ESTSHIFTED	63143	GMTSHIFTED	63144	GMTMODU24	63145
BLASTOFF	63146	YEARMONTH	63147	DAY	63150
HOURREG	63151	MINREG	63152	FIRSTTHRU	63153
DUMSECTTG	63154	RECRDSWTCH	63155	RELEASESW	63156
RADINDIC	63157	PRINRECSW	63160	REFRACIND\$	63161
AZELIND\$	63162	ID1RECRD	63210	ID2RECRD	63211
RECFILE	63212	ID1SYSPAR	63310	ID2SYSPAR	63311
RADARMODE	63312	SYSTAT1	63313	SYSTAT2	63314
SYSTATD	63315	DELTATEE	63316	FREQUENCY	63317
LONGITUDE	63320	GEODETLAT	63321	GEOCENLAT	63322
EQUATOR	63323	POLE	63324	AZIMOVER	63325
HEIGHT	63326	YRTRAN	63327	ZRTRAN	63330
SKIP	63331	MSFREQ	63332	WFFREQ	63333
MAINSWITCH	63334	VELOFLIGHT	63335	LSPERAU	63336
FLATTENING	63337	NMPERAU	63340	AUPEREQUAT	63341
KMPERNM	63342	MOONSW\$	63343	KYRROSPEC1	63344

KYBRDSPEC2	63345	KYBRDSPEC3	63346	KYBRDSPEC4	63347
EXPNAME	63350	ID1ENTPNT	63410	ID2ENTPNT	63411
MCPGM	63412	INTER	63413	COCON	63414
RECRD	63415	ADSCN	63416	AESCN	63417
CORCT	63420	DYDMP	63421	CHCOR	63422
PRLG	63423	CELCOMP GM	63424	DATANALYZE	63425
INTERCOM	63426	IC	63426	ACQUI	63427
RDMTR	63430	CHPAR	63431	WFORD	63432
RDXXX	63433	PLANP	63434	TIMEP	63435
PLOTP	63436	AUTOT	63437	ID1RADIO	63440
ID2RADIO	63441	AZIMADD	63442	ELEVADD	63443
DOPPADD	63444	RANGEADD	63445	INAZIMADD	63446
INELEVADD	63447	WFADD	63450	MILLSTNADD	63451
SYS COMREG1	63452	SYS COMREG2	63453	SYS COMREG3	63454
SYS COMREG4	63455	SYS COMREG5	63456	SYS COMREG6	63457
INTERLCKSW	63460	PREVIOUS TM	63461	BODysize	63462
AZELBXSCAN	63500	M1	63500	M2	63501
AZMTHSCAN	63501	M3	63502	ELVTNSCAN	63502
RADC BXSCAN	63503	M4	63503	M5	63504
RASCTNSCAN	63504	M6	63505	DECLINSCAN	63505
ALNGACRSCN	63506	M7	63506	M8	63507
AEBOXLINES	63507	RDRBOXLINES	63510	M9	63510
HOLDNOHOLD	63511	M10	63511	KKAL	63512
AZIMOFFSET	63512	KKEL	63513	ELEVOFFSET	63513
RAOFFSET	63514	KKRL	63514	KKDL	63515
DECOFFSET	63515	CRSSOFFSET	63516	KKCL	63516
KKLL	63517	ALNGOFFSET	63517	TIMETOHOLD	63520
TOME	63520	PERIOD ELEV	63521	KET	63521
ARCOFELEV	63522	KEL	63522	PERIODAZIM	63523
KAT	63523	KAL	63524	ARCOFAZIM	63524
KDT	63525	PERIODDEC	63525	KDL	63526
ARCOFDEC	63526	KRT	63527	PERIODRA	63527
ARCOFRA	63530	KRL	63530	RADECOTIME	63531
NULL	63531	NULLY	63532	AZELOTIME	63532
RADIORA	63540	RADIODEC	63541	SYNCTIMING	63542
ID3RADIO	63776	ID4RADIO	63777	AZIMOUT	64000
ID5RADIO	64776	ID6RADIO	64777	ELEVOUT	65000
ID7RADIO	65776	ID8RADIO	65777	DOPPOUT	66000
ID9RADIO	66776	ID10RADIO	66777	RECAZIM	67000
ID11RADIO	67776	ID12RADIO	67777	RECELEV	70000
ID13RADIO	70775	ID14RADIO	70776	RANGEOUT	70777
MCPFILLER	71000	ID15RADIO	71776	ID16RADIO	71777
INTERAZIM	72000	ID17RADIO	72776	ID18RADIO	72777
INTERELEV	73000	ID19RADIO	73776	ID20RADIO	73777
INTERDOPP	74000	ID21RADIO	74776	ID22RADIO	74777
AZIMIN	75000	ID23RADIO	75776	ID24RADIO	75777
ELEVIN	76000	ID25RADIO	76775	ID26RADIO	76776
INTERKANGE	76777	ID1SYSSENT	77576	ID2SYSSENT	77577
SYSENTRIES	77600	ID1SYSNAM	77676	ID2SYSNAM	77677
SYSNAMES	77700				

DISTRIBUTION LIST

Division 3

S. H. Dodd

Group 31

J. R. Burdette
P. Crowther
R. F. Gagne (2)
M. A. Gordon
R. P. Ingalls
M. L. Meeks
G. H. Pettengill
W. Rutkowski
P. B. Sebring
M. L. Stone

Division 4

H. G. Weiss

Division 6

W. E. Morrow

Group 62

W. R. Crowther (5)
A. F. Dockrey
J. D. Drinan
D. M. Hafford
F. E. Heart
I. L. Lebow
A. A. Mathiasen
F. Nagy
S. B. Russell
R. J. Saliga
P. Stylos
Group 62 Files (5)

UNCLASSIFIED

Security Classification

DOCUMENT CONTROL DATA - R&D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)