

PROCEDURE FOR UPDATING POINTING CONSTANTS IN THE DDP-116

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- I. Measure pointing corrections in the standard way. Tabulate the data by hour angle and declination (i.e., by reference source).
- II. The IBM 360 program (yellow FORTRAN source deck, labelled POINTING CORRECTION PROGRAM 13 APRIL 1967):

a. Prepare data cards:

1. Header card gives date, telescope number, and antenna station. As an example, take 29 July 1967, 85-3 on station 18:

Card column: 

			5				10				15				20				25
--	--	--	---	--	--	--	----	--	--	--	----	--	--	--	----	--	--	--	----

Entry: 

2	9	0	7	6	7		3			1	8								
---	---	---	---	---	---	--	---	--	--	---	---	--	--	--	--	--	--	--	--

2. Data cards, containing HA in hours and tenths (- for east, + for west), declination in degrees and tenths,  $\Delta\alpha$  in seconds of time,  $\Delta\delta$  in minutes of arc. Example of format:

Card column: 

			5				10				15				20				25
--	--	--	---	--	--	--	----	--	--	--	----	--	--	--	----	--	--	--	----

Entry: 

		-	3	.	2		5	8	.	6		-	4	.	0			1	.	8
--	--	---	---	---	---	--	---	---	---	---	--	---	---	---	---	--	--	---	---	---

This is for Cas A, HA = 3.<sup>h</sup>2 E,  $\delta = +58^{\circ}6$ ,  $\Delta\alpha = -4.<sup>s</sup>0$ ,  $\Delta\delta = +1'.8$ .

3. Stop card, which is simply a dummy data card with HA = 10.<sup>h</sup>0, and zeros for the remaining entries.

- b. Run the 360 program as a compile and execute job. This takes 90 to 95 seconds. EXPRESS JOB!
- c. The vital part of the 360 output is the block of 16 constants, H1 - H9 and D1 - D7.

- III. Conversion of the constants into the correct form for entry into the DDP-116: This involves multiplying them by 16 and converting to octal fractions of a circle, with negative values in 2's complement form. Use the conversion table appended to the end of this report.

Example:

Constant	360 output	116 input
H1	-2!4	177706
H2	0.9	26
H3	0.0	0
H4	0.3	7
H5	-1.9	177722
H6	0.1	2
H7	3.9	137
H8	0.9	26
H9	0.2	5
D1	3.3	120
D2	-1.5	177734
D3	0.3	7
D4	0.3	7
D5	1.6	47
D6	0.8	23
D7	-3.4	177655

IV. Load new constants in core:

- a. Reload IOCS.
- b. Load the tape program named "Routine for Updating Pointing Constants in Core".
- c. Make the following entries from the computer console:

Location	Quantity
14000	Telescope no. (1,2,3)
14001	H1
14002	H2
14003	H3
14004	H4
14005	H5
14006	H6
14007	H7
14010	H8
14011	H9
14012	D1
14013	D2
14014	D3
14015	D4
14016	D5
14017	D6
14020	D7

Read them back to prove they have all been entered correctly before going on to the next step! This is important.

- d. Branch to 14025 and press START. Lights blink and the computer halts. New constants are now stored where they belong in core.

V. Reload the pointing programs into disk from core:

- a. Load the tape labelled "Loader IBM 360 OB Deck".
- b. Get the 360 object deck marked CORE TO DISK. Put it in the card reader, branch to 16200, and press START. The cards are read.
- c. Branch to 14001 and press START. Teletype calls for entry.  
Type  
12000,106,010,(line feed)(carriage return)  
Teletype writes DONE and the computer halts.
- d. Repeat step V(b) above.
- e. Repeat step V(c), except that this time the type-in entry must be  
15000,117,005,(line feed)(carriage return)  
Again the beast writes DONE, and it halts. Now the disk should be correct.

VI. Make a new system tape:

- a. Find the oldest magnetic tape labelled "Disk System", insert a file protect ring, and mount it on the tape drive. Bring the tape to load point and press AUTO.
- b. Load the paper tape marked "MTL".
- c. Set Sense Switch 3, branch to 16500, and press START twice. One record is written and the computer halts.
- d. Turn off Sense Switch 3 and rewind the tape (but don't dismount it!).
- e. Load the paper tape marked "Loader IBM 360 OB Deck".
- f. Get the 360 card deck labelled DISK TO TAPE and put it in the card reader. Branch to 16200 and press START. The cards are read and the computer halts.
- g. Transfer to 14000 and press START twice.
- h. Typewriter calls for the date. Type  
YY/MM/DD(carriage return)  
The program is executed (justice!) and the teletype says DONE when the grisly chore is finished.

1. Remove the tape from the tape drive, take out the file protect ring, and write the new date on the label.

VII. Reload the disk from the system tape:

- a. Load the paper tape marked "Loader IBM 360 OB Deck".
- b. Get the 360 card deck labelled TAPE TO DISK and put it in the card reader. Branch to 16200 and press START. The cards are read and the computer halts.
- c. Press START. The teletype types the date on the magnetic tape. Verify that it is correct.
- d. Press START. The tape is read into the disk, and then it is rewound.
- e. Remove the tape and put it away.

Angle Conversion Table

360 output	116 input		360 output	116 input	
	+	-		+	-
0!0	0	0			
0.1	2	177776	4!1	144	177634
0.2	5	177773	4.2	146	177632
0.3	7	177771	4.3	150	177630
0.4	12	177766	4.4	153	177625
0.5	14	177764	4.5	155	177623
0.6	17	177761	4.6	160	177620
0.7	21	177757	4.7	162	177616
0.8	23	177755	4.8	165	177613
0.9	26	177752	4.9	167	177611
1.0	30	177750	5.0	171	177607
1.1	33	177745	5.1	174	177604
1.2	35	177743	5.2	176	177602
1.3	40	177740	5.3	201	177577
1.4	42	177736	5.4	203	177575
1.5	44	177734	5.5	205	177573
1.6	47	177731	5.6	210	177570
1.7	51	177727	5.7	212	177566
1.8	54	177724	5.8	215	177563
1.9	56	177722	5.9	217	177561
2.0	61	177717	6.0	222	177556
2.1	63	177715	6.1	224	177554
2.2	65	177713	6.2	226	177552
2.3	70	177710	6.3	231	177547
2.4	72	177706	6.4	233	177545
2.5	75	177703	6.5	236	177542
2.6	77	177701	6.6	240	177540
2.7	102	177676	6.7	243	177535
2.8	104	177674	6.8	245	177533
2.9	106	177672	6.9	247	177531
3.0	111	177667	7.0	252	177526
3.1	113	177665	7.1	254	177524
3.2	116	177662	7.2	257	177521
3.3	120	177660	7.3	261	177517
3.4	123	177655	7.4	264	177514
3.5	125	177653	7.5	266	177512
3.6	130	177650	7.6	270	177510
3.7	132	177646	7.7	272	177506
3.8	134	177644	7.8	275	177503
3.9	137	177641	7.9	300	177500
4.0	141	177637	8.0	302	177476