



Smithsonian
National Museum of American History
Behring Center

8 July 2004

Paul McJones
710 View Street
Mountain View, CA 94041

Paul:

Here are a few examples of pages including the letter from IBM to Mr. Ingerman and the table of contents. The actual SAP listings (which are double-sided) are all in the multiple column format.

I hope this gives you a good starting point!

Sincerely,

Alicia Cutler
Specialist, Collections of Computers & Mathematics
MRC 637

t 202-633-3806
f 202-633-9338
e cutleram@si.edu

IBM

590 Madison Avenue
New York 22, N. Y.
Telephone: Plaza 3-1900

International Business Machines Corporation

May 13, 1959

Mr. Peter Zilahy Ingerman
Research Investigator
The Computer Center
University of Pennsylvania
Philadelphia 4, Pennsylvania

Dear Mr. Ingerman,

Thank you for your letter of April 27, 1959 in which you requested a copy of the SAP listings for the final version of 704 FORTRAN II and the Operations Manual for FORTRAN II.

We are sending to you under separate cover a copy of both the SAP listings and the Operations Manual for the final version of 704 FORTRAN II. May we observe that a very limited number of copies of the FORTRAN II SAP listings were printed for distribution only to 704 machine installations using the system. We are, however, making this FORTRAN material available to you in a sincere desire to cooperate with a university group interested in investigating automatic coding problems.

We would be interested in your reactions to this FORTRAN II material and also in your applications of it. Please call upon us for any further assistance you may require in the FORTRAN area.

Very truly yours,



A. L. Harmon
Manager, Applied Programming

HB/ALH/js

cc Mr. W. T. Hamlin, IBM, Philadelphia
Dr. M. A. Shader, DPDHQ

704 FORTRAN II
TABLE OF CONTENTS FOR 4K-8K VERSION

SAP LISTINGS OF THE 4K AND 8K DRUM VERSIONS.

THESE LISTINGS CONSTITUTE THE ENTIRE FINAL VERSION OF 704 FORTRAN II. LISTINGS OF ASSOCIATED PROGRAMS, SUCH AS THE EDITOR, HAVE ALSO BEEN INCLUDED. THE LISTINGS HAVE BEEN ARRANGED SO THAT THERE IS A CLOSE CORRESPONDENCE WITH THE RECORDS ON THE FINAL FORTRAN II MASTER TAPE. WHEREVER, ON THE MASTER TAPE, A SINGLE FORTRAN RECORD MUST APPEAR AS SEPARATE 4K AND 8K VERSIONS, THE MAIN LISTINGS SEQUENCE INCLUDES THE 4K VERSION. THE 8K RECORDS, THEREFORE, APPEAR AT THE END. FURTHER INFORMATION PERTINENT TO THESE LISTINGS AND THE FORTRAN II MASTER TAPE CAN BE FOUND IN THE OPERATIONS MANUAL, PARTICULARLY ON PAGES 5 THROUGH 15.

THE FOLLOWING FORTRAN II RECORDS ARE DIAGNOSTIC CALL-IN RECORDS AND ARE BASICALLY THE SAME. FOR THIS REASON THEY HAVE BEEN OMITTED FROM THE MAIN LISTINGS. AN EXAMPLE OF A DIAGNOSTIC CALL-IN RECORD CAN BE FOUND ON PAGE 969 OF THESE LISTINGS.

2	035	054	074	093
4	038	057	077	095
6	040	059	079	097
8	042	061	081	099
23	044	063	083	102
25	046	066	085	104
28	048	068	087	106
31	050	070	089	108
33	052	072	091	114

TABLE OF CONTENTS
FORTRAN
RECORD NUMBER

CONTENTS	RECORD NUMBER	PAGE
1-CS	000	1
CARD TO TAPE	001	2
SECTION 6	RECORD R 003	6
SECTION 6	RECORD S 005	14
SECTION 6	RECORD T 007	18
SUCCESSFUL COMPILATION	009	20
SOURCE PROGRAM ERROR	010	21
BATCH MONITOR	012	22
MACHINE ERROR	013	30
SECTION 1 /4K VERSION/	014	31
	015	58
	016	123
	017	109
	018	95
	019	60
SECTION 1 DIAGNOSTIC	020	143

CONTENTS	FORTRAN RECORD NUMBER	PAGE
SECTION 1 PRIME	021	202
	022	181
	024	190
SECTION 1 DOUBLE PRIME	026	207
SECTION 2 BLOCK 1	027	221
SECTION 2 BLOCK 2	029	277
	030	269
	032	258
	034	240
SECTION 2 BLOCK 3	036	279
	037	282
	039	285
	041	287
	043	296
SECTION 2 BLOCK 4	045	301
SECTION 2 BLOCK 5	047	312
	049	345
	051	314
SECTION 2 BLOCK 6	053	371
SECTION 3 OPEN SUBROUTINES	055	373
SECTION 3 PART 1 OF MERGE	056	376
SECTION 3 PART 2 OF MERGE	058	400
SECTION 3 PART 3 OF MERGE	060	426
SECTION 4 /4K AND 8K VERSIONS/	062	441
	064	455
	065	466
	067	468
	069	473
	071	475
	073	478
SECTION 5 /4K VERSION/	075	489
	076	544
	078	546
	080	546
	082	547
	084	547
	086	551
	088	554
SECTION 5 PRIME	090	583
SECTION 6 RECORD A	092	591
SECTION 6 RECORD B	094	606
SECTION 6 RECORD C	096	610
SECTION 6 RECORD D	098	616
SECTION 6 RECORD E	100	620
SECTION 6 RECORD F	101	623
SECTION 6 RECORD G	103	626
SECTION 6 RECORD H	105	633

CONTENTS	FORTRAN RECORD NUMBER	PAGE	
SECTION 6	RECORD I	107	637
SECTION 6	RECORD J	109	641
SECTION 6	RECORD K	110	645
SECTION 6	RECORD L	111	651
SECTION 6	RECORD M	112	652
SECTION 6	RECORD N	113	658
SECTION 6	RECORD P	115	664
SECTION 1	/8K VERSION/	014A	678
		016A	741
SECTION 5	/8K VERSION/	075A	788
		076A	846
		078A	848
		080A	849
		082A	849
		084A	850
		086A	853
		088A	857
<hr/>			
<u>II</u>	DBC	PERMANENT LIBRARY	885
<u>III</u>	CSH	PERMANENT LIBRARY	897
	TSH	PERMANENT LIBRARY	900
	BDC	PERMANENT LIBRARY	901
	SCH	PERMANENT LIBRARY	913
	SPH	PERMANENT LIBRARY	916
	STH	PERMANENT LIBRARY	920
	LRT	PERMANENT LIBRARY	921
	EXP 1	PERMANENT LIBRARY	924
	EXP 2	PERMANENT LIBRARY	925
	EXP 3	PERMANENT LIBRARY	927
	LOG	GENERAL LIBRARY	930
	SIN/COS	GENERAL LIBRARY	931
	EXP	GENERAL LIBRARY	934
	SQRT	GENERAL LIBRARY	936
	ATAN	GENERAL LIBRARY	937
	TANH	GENERAL LIBRARY	939
	EDT	EDITOR PROGRAM	941
	PLIB	PERMANENT LIBRARIAN	946
	GLIB	GENERAL LIBRARIAN	949
	TCVP	TAPE COPY & VERIFY PROGRAM	955
	BSS LOADER	BINARY SYMBOLIC SUBROUTINE LOADER	960
	DIAGNOSTIC EDITOR		965
	DIAGNOSTIC CALL-IN EXAMPLE		969
	DIAGNOSTIC READ-IN		970
	MAIN DIAGNOSTIC RECORD		971
	DIAGNOSTIC ERROR COMMENT #1		993
	THROUGH		THROUGH
	DIAGNOSTIC ERROR COMMENT #190		1321

REM 704 FORTRAN SELF LOADING RECORD 1 TO CS
704 FORTRAN SELF LOADING RECORD 1 TO CS.

00000 0 53400 1 00000 LXA 0,1
 00001 0 70000 1 00002 CPY 2,1
 00002 1 00001 1 00001 TXI 1,1,1
 00003 0 70000 1 00031 CPY 25,1
 00004 0 00000 0 00003 HTR 3
 00005 0 10000 0 00000 TZE 0
 00006 0 76000 0 00006 COM
 00007 0 36100 0 00002 ACL 2
 00010 0 76000 0 00006 COM
 00011 0 02000 0 00027 TRA 23
 00012 0 76000 0 00012 RTT
 00013 0 76600 0 00333 IOD
 00014 0 00000 0 00000 HTR 0
 00015 1 77777 1 00015 TXI 13,1,-1
 00016 0 70000 1 00000 CAD 0,1
 00017 0 50000 0 00017 CAL 15
 00020 0 62100 0 00026 STA 22
 00021 0 77100 0 00022 ARS 18
 00022 0 62100 0 00015 STA 13
 00023 0 50000 0 00017 CAL 15
 00024 0 70000 0 00017 CPY 15
 00025 0 70000 0 00002 CPY 2
 00026 0 76200 0 00221 RTB 1
 00027 0 53400 1 00027 LXD 23,1
 00030 0 70000 0 00003 CPY 3
 00031 0 76000 0 00007 LTM
 00032 0 76400 0 00221 BST 145
 00000 00000 END

IN MEMORY IT LOOKS

0	00	LXA	0,1
1	01	CPY	25,1
2	02	LTM	
3	03	BST	145
4	04	LXD	23,1
5	05	RTB	1
6	06	CPY	2
7	07	CPY	15
8	10	CAL	15
9	11	STA	13
10	12	ARS	18
11	13	STA	22
12	14	CAL	15
13	15	CAD	0,1
14	16	TXI	13,1,-1
15	17	HTR	0
16	20	IOD	
17	21	RTT	
18	22	TRA	23
19	23	COM	
20	24	ACL	2
21	25	COM	
22	26	TZE	0
23	27	HTR	3

Enter 04 to read next record.

Word 1 in = check sum

2 address = starting core for word 3

2 document = transfer locate

A.

I Believe this is the only written note in all 3 volumes.

1
1

REM FORTRAN II CARD-TO-TAPE

FORTRAN II CARD-TO-TAPE

	00110	0	76200	0	00321	BEGIN	ORG 72 RCD 1		
	00111	-0	53400	1	00125		LXD ADD01,1		
	00112	-0	53400	2	00127		LXD ADD02,2		
TD	00113	0	70000	0	00340	ADD23	CPY L9ROW		COPY 92
	00114	-3	00000	0	00116		TXL ADD03,		
	00115	0	02000	4	00002		TRA 2,4		EOF TR
	00116	-0	60000	0	00332	ADD03	STQ DATA1		STORE 9L
	00117	-0	63400	1	00125		SXD ADD01,1		
	00120	-0	63400	2	00127		SXD ADD02,2		
	00121	-0	53400	1	00135		LXD ADD04,1		
	00122	0	70000	0	00341		CPY R9ROW		COPY 9R
	00123	-0	60000	0	00333		STQ DATA2		STORE 9R
TD	00124	0	07400	2	00265		TSX SUB1,2		EXIT ENTRY1 SUB1
	00125	-3	00000	0	00130	ADD01	TXL ADD05		RETURN1
TD	00126	0	76700	0	00001		ALS 1		RETURN2
	00127	-3	00000	0	00317	ADD02	TXL ADD06		EXIT TO ENTRY2 SUB1
	00130	0	70000	0	00334	ADD05	CPY DATA3		
	00131	-0	60000	0	00332		STQ DATA1		
	00132	0	70000	0	00335		CPY DATA4		COPY RIGHT
	00133	-0	60000	0	00333		STQ DATA2		
	00134	0	07400	2	00265		TSX SUB1,2		
	00135	-3	00010	0	00140	ADD04	TXL ADD07,0,8		RETURN1
TD	00136	0	76700	0	00003		ALS 3		RETURN2
	00137	-3	00000	0	00316		TXL ADD08		
	00140	-0	50000	0	00340	ADD07	CAL L9ROW		
	00141	0	60200	0	00332		SLW DATA1		
	00142	-0	50000	0	00341		CAL R9ROW		
	00143	0	60200	0	00333		SLW DATA2		
	00144	-3	00001	1	00170	ADD14	TXL ADD09,1,1		
TD	00145	0	70000	0	00340	ADD15	CPY L9ROW		
	00146	-3	00000	0	00151		TXL ADD10		
TD	00147	0	00000	0	00110	ADD12	HTR BEGIN		EOF
	00150	-3	00000	0	00210		TXL ADD11		EOR
TD	00151	-0	50000	0	00340	ADD10	CAL L9ROW		
	00152	-0	32000	0	00332		ANA DATA1		
	00153	-0	10000	0	00147		TNZ ADD12		
	00154	-0	50000	0	00340		CAL L9ROW		
	00155	-0	60000	0	00332		ORS DATA1		
	00156	0	70000	0	00341		CPY R9ROW		
	00157	-0	50000	0	00341		CAL R9ROW		
	00160	-0	32000	0	00333		ANA DATA2		
	00161	-0	10000	0	00147		TNZ ADD12		
	00162	-0	50000	0	00341		CAL R9ROW		
	00163	-0	60200	0	00333		ORS DATA2		
	00164	-2	00001	1	00204		TNX ADD13,1,1		
TD	00165	0	07400	2	00265		TSX SUB1,2		
	00166	-3	00000	0	00144		TXL ADD14		RETURN1
TD	00167	-3	00000	0	00316		TXL ADD08		RETURN2
	00170	-0	50000	0	00334	ADD09	CAL DATA3		
	00171	-0	50100	0	00332		ORA DATA1		
	00172	0	60200	0	00334		SLW DATA3		

00177	0	02000	0	00155	TRA BSTRN		F1BM1030
00200	-0	75400	0	00000	PXD 0,0	SUBROUTINE TO BRING NEXT NON BLANK	F1BM1040
00201	2	00001	2	00205	TIX ADD50,2,1	CHAR OF BUFFER REGION TO AC.	F1BM1050
00202	0	53400	2	00240	LXA L(6),2		F1BM1060
00203	0	56000	1	00234	LDD BUFFER,1		F1BM1070
00204	1	77777	1	00205	TXI ADD50,1,-1		F1BM1080
00205	-0	76300	0	00006	ADD50 LGL 6		F1BM1090
00206	0	34000	0	00246	CAS BLANK		F1BM1100
00207	0	02000	0	00211	TRA ADD51		F1BM1110
00210	0	02000	0	00200	TRA SUB1		F1BM1120
00211	0	34000	0	00235	ADD51 CAS ENDMK		F1BM1130
00212	0	02000	4	00001	TRA 1,4		F1BM1140
00213	0	02000	0	00033	TRA ADD01		F1BM1150
00214	0	02000	4	00001	TRA 1,4		F1BM1160
00215	016060606060				RESTR BCD 11		F1BM1165
					00234 BUFFER BES 14		F1BM1170
00234	-377777777777				OCT 777777777777		F1BM1180
00235	+000000000077				ENDMK OCT 77		F1BM1190
00236	0	00000	0	00003	L(3) 3		F1BM1200
00237	0	00000	0	00005	L(5) 5		F1BM1210
00240	0	00000	0	00006	L(6) 6		F1BM1220
00241	0	00000	0	00007	L(7) 7		F1BM1230
00242	0	00000	0	00014	L(12) 12		F1BM1240
00243	0	00000	0	00016	L(14) 14		F1BM1250
00244	000000000023				L(C) BCD 100000C		F1BM1260
00245	606060606060				BLANKS BCD 1		F1BM1270
00246	000000000060				BLANK BCD 100000		F1BM1280
00247	000000000025				L(E) BCD 100000E		F1BM1290
00250	000000000045				L(N) BCD 100000N		F1BM1300
00251	000000000024				L(D) BCD 100000D		F1BM1310
00252	000000000074				L(I) BCD 100000I		F1BM1320
00253	000000000073				COMMA BCD 100000,		F1BM1330
00254	006060606060				TP5ERR BCD 90	TAPE 5 CONTAINING SOURCE SUBPROGRAM READ 5 TIMES	F1BM1340
00255	632147256005						
00256	602346456321						
00257	314531452760						
00260	624664512325						
00261	606264224751						
00262	462751214460						
00263	512521246005						
00264	606331442562						
00265	606445626423				BCD 9 UNSUCCESSFULLY. TAPE 5 NOW POSITIONED AT RECORD WHICH		F1BM1350
00266	232562622664						
00267	434370336063						
00270	214725600560						
00271	454666604746						
00272	623163314645						
00273	252460216360						
00274	512523465124						
00275	606630312330						
00276	602321454546				BCD 3 CANNOT BE READ.		F1BM1360
00277	636022256060						
00300	512521243360						
					00301 TP5END BSS 0		F1BM1370

THE FOLLOWING CONVENTIONS ARE USED IN THIS LISTING=
 ** IN THE ADDRESS, TAG, OR DECREMENT OF AN INSTRUCTION
 INDICATES THAT THIS FIELD WILL BE MODIFIED BY THE PROGRAM.
 * IN COL/36 INDICATES THE INSTRUCTION IS A TRANSFER OUT OF
 THIS LOGICAL BLOCK OR SUBROUTINE.
 C IN COL/34 INDICATES THE INSTRUCTION WAS CORRECTED.
 P IN COL/32 INDICATES THE INSTRUCTION WAS INSERTED (PATCH).
 * * * * *

				CONTROL CARD FOR DBC.		DBC/C01
		00000		ORG 0		DBC/C02
00000	0	00000	0	PZE TAB+1		DBC/C03
00001	0	00000	0	PZE COMMON		DBC/C04
00002	742422233460			BCD 1(DBC)		DBC/C05
00003	0	00000	0	PZE (DBC)		DBC/C06
				END OF DBC CONTROL CARD.		DBC/C07
				* * * * *		DBC/C08
		00000		ORG 0		DBC/C09
				(DBC)/ CALLS=LINE,READ. CALLER=MAIN PROGRAM.		DBC/001
				(DBC) CONTROLS DECIMAL TO BINARY CONVERSION AND INPUT.		DBC/002
00000	0	02100	0	00001 (DBC) TTR NEW	INSTRUCTION EXECUTED IN LOCATION 1.	DBC/003
				NEW = ENTRY POINT FROM MAIN PROGRAM (CIAC)= ADDRESS OF INPUT	ROUTINE TO HANDLE CURRENT INPUT, AND C(I)= LOCATION OF THE	DBC/004
				CURRENT FORMAT STATEMENT).		DBC/005
						DBC/006
						DBC/007
00001	-0	76000	0	00007 NEW	LTM SET RBCD TO CALL THE INDICATED	DBC/008
00002	0	62100	0	00304	STA TYPE TYPE OF INPUT ROUTINE.	DBC/009
00003	-0	50000	0	00000	CAL 0 SET INPUT FORMAT STATEMENT	DBC/010
00004	0	62100	0	00007	STA CALL LOCATION.	DBC/011
00005	0	40000	0	00626	ADD ONE SET EXIT	DBC/012
00006	0	62100	0	00015	STA FX4 TO MAIN PROGRAM.	DBC/013
00007	-0	50000	0	00000 CALL	CAL ** OBTAIN FORMAT STATEMENT	DBC/014
00010	-0	63400	4	00015	SXD FX4,4 FOR SCAN.	DBC/015
00011	0	07400	4	00036	TSX LINE,4 * GO SCAN FORMAT.	DBC/016
00012	-0	53400	4	00015	LXD FX4,4 WHEN DONE, RESTORE C(XR4).	DBC/017
00013	-0	50000	0	00016	CAL TRAP SET LOCATION 1 FOR FUTURE	DBC/018
00014	0	60200	0	00001	SLW 1 TRAP TRANSFER TO SEEK, AND	DBC/019
00015	1	00000	0	00000 FX4	TXI **,0,** * TRANSFER CONTROL TO MAIN PROGRAM.	DBC/020
				THE MAIN PROGRAM CONTROLS ALL INDEXING OF THE LIST.		DBC/021
00016	0	02100	0	00017 TRAP	TTR SEEK INSTRUCTION EXECUTED IN LOCATION 1.	DBC/022
				SEEK = REENTRY POINT FROM MAIN PROGRAM (C(I)= LOCATION OF	THE ADDRESS OF THE NEXT INPUT NUMBERS).	DBC/023
						DBC/024
00017	-0	76000	0	00007 SEEK	LTM PICKUP NTR INSTRUCTION, AND	DBC/025
00020	-0	50000	0	00000	CAL 0 SET LOCATION	DBC/026
00021	0	62100	0	00024	STA SETL OF INPUT NUMBERS.	DBC/027
00022	0	40000	0	00626	ADD ONE SET LOCATION FOR	DBC/028
00023	0	62100	0	00035	STA OUT RETURN TO MAIN PROGRAM.	DBC/029
00024	0	50000	0	00000 SETL	CLA ** PICKUP LOCATION OF INPUT	DBC/030
00025	0	60100	0	00033 STO	STO PUT AND SET ADDRESS AND TAG OF PUT.	DBC/031
00026	0	56000	0	00025	LDQ STO SET PUT OP	DBC/032
00027	-0	62000	0	00033	SLQ PUT TO STO.	DBC/033