	MATHEK	FOR BAST	C 4Ce 80	BO GATES/A	LLEN/DAVIDOFF	MACON I	7/1171	24.420 27.44	0.75 0.05 0	
	F4	MAC	23=AUG=	64 06:08		T INTEGE			G#73 PAGE 9	
7.	1524				23820	SUBTTL		EST INTEGER		
١,	1525				23840				NTEGER FUNCTION	
	1526				23860		ILEAVE	ES INT (FAC)	IN C,D,E (SIGNED)	
	1527				23880		IASSU	HES FAC .LT.	2*23 = 8388608	
	1528				23900		IASSU	HES THE EXPO	NENT OF FAC IS IN A	
	1529				23920		JALTER	RS A, B, C, D, E		
	1530	001372	001000	000107	23940	GINT:	MOV	B, A	;ZERO B,C,D,E I	N CAS
١.	1531	001373	001000	000117	23960		MOV	C, A		
	1532	001374	001000	000127	23980		MOV	D.A		
	1533	001375*		000137	24000		MOV	E, A		
	1534	001376		000267	24020		ORA	A	ISET CONDITION	CODES
	1535	001377*		000310	24040		RZ	-	IT IS ZERO, WE	
	1536	001311	001000	000310	44646		n Z		111 13 ZERU, WE	ARE
	1537				24080	. THE HA	PO CARE		NEGATIVE NON-INTEGERS	-
	1001				24000	/ Inc na	NU LASE	TH MINI TO	NEGALIVE NUNTINTEGERS	. 10

24040 IT IS ZERO. WE ARE DONE RZ ITHE HAND CASE IN OINT IS NEGATIVE NON-INTÉGERS, TO MANQUE THIS, IF THE INUNBER IS NEGATIVE, WE REGARD THE 3-BYTE MANTISSA AS A 3-BYTE INTEGER AND ISUSTANCI ONE, THEM LAITHE PRACTIONAL SITE ARE SHIFTED OUT BY SHIFTING THE INANTISSA RIGHT. THEM, IF THE NUMBER HAS NEGATIVE, MOD DUNE, SO THE MEDIAN A REGATIVE INTEGER ALL THE SHIFT OF THE BUARRY POINT HERE JACEN, SO THE NET EFFECT IS HE HAVE THE DESIGNAL NUMBER IN CO.D.E. IF THE JACEN SA NEGATIVE NON-INTEGER, THERE IS AT LEAST ONE NON-EXPENDED BIT TO THE JACEN FOR THE SHAPE THE JACEN OF THE JACEN SO THE NET EFFECT IS THAT WE GET THE ASSOLUTE JACEN OF THE DIAFF POINT, SO THE NET EFFECT IS THAT WE GET THE ASSOLUTE JACEN OF THE DIAFF POINT OF THE DIAFF POINT OF THE STANCE OF TH 24080 24100 24120 24140 24160 24180 24200 24220 24240 24260 24280 24300 H MOVRF

WANT A SIGNED MANTISSA

SE THE NUMBER IS ZERO

. •

.

.

•

•

•

.

•

•

•

• •

• •

• •

•

.

•

1538 1539 1540 1541 1542 1543 1544 1545 1546 1547 1548 1549 1550 001400' 001000 001401' 001000 001402' 000000 001403' 001000 001403' 001000 001403' 001000 001403' 001000 001403' 001000 001411' 001000 001411' 001000 001411' 001000 001411' 001000 001411' 001000 001412' 000000 001412' 001000 001412' 001000 001412' 001000 001412' 001000 001412' 001000 001412' 001000 001412' 001000 001412' 001000 001412' 001000 001412' 001000 001412' 001000 001412' 001000 001412' 001000 001412' 001000 001412' 001000 000345 000315 001240* 001342* 1551 1552 1553 1554 24320 CALL UNPACK JUNPACK THE NUMBER 001402 JGET SIGN OF NUMBER
JOON'T LOSE IT
JSUBTRACT 1 FROM LO IF NUMBER IS NEGATIVE 24340 XRA 1555 1556 1557 1558 1559 1560 000147 000374 001436* 001405* 000076 000230 000220 000315 24400 MVI A,230 ISEE HOW MANY WE HAVE TO SHIFT TO CHANGE 1561 SUB I NUMBER TO AN INTEGER
ISHIFT NUMBER TO GET RID OF FRACTIONAL BITS SHIFTR 000315 000334* 001412* 000174 000027

A,H

1563 1564 1565 1566 1567 1568 1569 1570 JGET SIGN
JPUT SIGN IN CARRY SO IT WILL NOT BE CHANGED
JIF NUMBER WAS NEGATIVE, ADD ONE 000334 000255* 001420* 000006 24500 ROUNDA CC 24520 MVI 8,0 FORGET THE BITS WE SHIFTED OUT 801427' 001000 001430' 000000 001431' 001000 001432' 000000 001433' 000000 1571 BBBBBB 24548 CC NEGR 000334 NEGATE NUMBER IF IT WAS NEGATIVE BECAUSE WE 000310

POP

24560

001434 001000 000341

MOV

MATHPK F4	FOR BASI	23-AUG-	64 06108	GREATES	MACRO 4	7 (113) 2 R FUNCTI	6:09 27-AUG	#75 PAGE 9#1
1577	001435*	001000	000311	24600		RET		FALL DONE
1579	001436*	001000	000033	24640	QINTA:	DCX	D	SUBTRACT ONE FROM C.D.E
1580		001000		24660	41	MOV	A,D	THE HAVE TO SUBTRACT ONE FROM C IF
1581	901440			24680		ANA	E	O AND E ARE BOTH ALL DNES
1582	001441*			24700		INR	A	SEE IF BOTH WERE #1
1583			000300	24720		RNZ	•	THEY WERE NOT, WE ARE DONE
1584				24740	IFN	LENGTH-	2.4	THE HERE HOT, HE ARE DONE
1585	001443*	001000	000015	24760	****	DCR	C>	THEY WERE, SUBTRACT ONE FROM C
1586		00.000	000010	24780	IFE	LENGTH-		THE HERE, SUBTRACT ONE FROM C
1587				24800	DCXBRT:		B>	THIS IS FOR BILL. C WILL NEVER BE ZERO
1588				24820	Dunbal.	000	0-	; (THE MSB WILL ALWAYS BE ONE) SO "DCX B"
1589				24840				; AND "DCR C" ARE FUNCTIONALLY EQUIVALE!
1590	001444	001000	000311	24860		RET		JALL DONE
1591	001444	001000	000011	24000				TACE DONE
1593				24920				C. MOTTO:
1594				24940			ST INTEGER	
1595				24960	IFE	LENGTH-	A, B, C, D, E,	7,6
1596				24980	INTENC:		4	ACCE WHAT WAND OF MUNDED OF MANY
1597				25000	INTENCT	RC	4	SEE WHAT KIND OF NUMBER WE HAVE
1598				25020		JNZ	DINT	IT IS AN INTEGER, ALL DONE
1599				25040		CALL		CONVERT THE DOUBLE PRECISION NUMBER
1600				25060		CALL	CONIS>	TRY TO CONVERT THE NUMBER TO AN INTEGER
1601				25080				; IF WE CAN'T, WE WILL RETURN HERE TO GIVE A
1602	001445*	801000	000001	25100	INT:	LXI	H, FAC	; SINGLE PRECISION RESULT
1603	001446		001156*	52150	THI	FXI	HIFAL	FGET EXPONENT
1604	001447		001432*					
1605	001450*		000176	25120		MOV		
1606	001451		000376	25140		CPI	A, M 230	ACCE TE NUMBER HAS ANN CRACTIONAL RIVE
1607	001452		000230	63146		CFI	230	SEE IF NUMBER HAS ANY FRACTIONAL BITS
1608	001436	000000	000630	25160	IFN	EXTENC.		ATHE OHEN CHE HUR MEETS THEN CONTAINS CARE
	0014531	991999	000072	25180	41.14	LDA.	FACLO>	THE DNLY GUY WHO NEEDS THIS DOESN'T CARE
1610	001454		001255*	52100		LUA	FACLUS	; ABOUT THE SIGN
1611	001455		001446					
1612				25200		RNC		
1613	001430	001000	000360	25220	IFN	EXTENC.		IT DOES NOT
1614	001457	901999	000176	25240	11.4	MOV.		ACET ENDOUGHE DAGE
1615	001460		000315	25260		CALL	A, M>	JGET EXPONENT BACK
1616	001461		001372*	63600		LALL	GINT	IT DOES, SHIFT THEM OUT
1617	001462		001454*					
	001463		000066	25280		MVI		
1619	001464		000230	\$2500		WAT	M,230	CHANGE EXPONENT SO IT WILL BE CORRECT
1620	001404	000000	SOSEDE	25300				* AFTER MORNAL TRAFFICH
1621				25320	YEN	EVTENO		; AFTER NORMALIZATION
	0010151	201000	000177	25340	IFN	EXTENC,		
1622	001465		000173 000365			MOV	A,E	GET LO
1623				25360		PUSH	PSW>	SAVE IT
1624	001467		000171	25380		MOV	A,C	NEGATE NUMBER IF IT IS NEGATIVE
1625	001470	001000	000027	25400		RAL		PUT SIGN IN CARRY
1626				25420	IFE	EXTENC,		
1627				25440		JMP	FADFLT>	REFLOAT NUMBER
1628				25460	IFN	EXTENC,		
1629	001471	001000	000315	25480		CALL	FADFLT	REFLOAT NUMBER

630	001472 0	anna	000143*					
631								
632				25500	POPPRT:	POP	PSW	JGET LO BACK
633	001475' 0	21000	000311	25520	rorrar.	RET		IALL DONE
634				23320				TALL DAIL
635								
636				25580	IFE	LENGTHE		
637				25600				ION FOR DOUBLE PRECISION NUMBERS
638				52650			A, B, C, D, E, H, L	TON FOR DOUBLE PRECISION NUMBERS
639				25640	DINT:	LXI		GET POINTER TO FAC
640				25660	02	MOV	A.M	JGET EXPONENT
641				25680		CPI	220	ICAN WE CONVERT IT TO AN INTEGER?
642				25700		JC	FRCINT	THEN DO SO
643				25720		JNZ	DINTE	1CHECK FOR =32768
644				25740		MOV	C, A	ISAVE EXPONENT IN C
645				25760		DCX	H	IGET POINTER TO SIGN AND HO
646				25780		MOV	A. M	GET SIGN AND HO
647				25800		XRI	200	ICHECK IF IT IS 200
648				25820		MVI	8,6	ISET UP A COUNT TO CHECK IF THE REST OF
649				25840	DINT1:		H .	THE NUMBER IS ZERO, POINT TO NEXT BYTE
650				25860		ORA	Ä	IF ANY BITS ARE NON-ZERO, A WILL BE NON-ZER
651				25880		DCR	В	JARE WE DONE?
652				25900		JNZ	DINTI	INO, CHECK THE NEXT LOWER ORDER BYTE
653				25920		ORA	A	IS A NOW ZERO?
654				25940		LXI		ACET TOTAL THET THE CASE
655				25960		JZ	CONISS	JGET -32768 JUST IN CASE
656				25980		MOV	A,C	A IS ZERO SO WE HAVE #32768
657				59000	DINT2:		270	
658				56050	014151	RNC	610	FARE THERE ANY FRACTIONAL BITS?
659				26040	DINTFO:		PSW	INO, THE NUMBER IS ALREADY AN INTEGER
668				26060	OTHILD:	FUSH	FOR	; ENTRY FROM FOUT, CARRY IS ZERO IF WE COME ; HERE FROM FOUT
661				26080		CALL	MOVRE	
965								GET HO'S OF NUMBER IN REGISTERS FOR UNPACKI
663				26100		CALL	UNPACK	JUNPACK IT
				26120		XRA	M H	GET ITS SIGN BACK
664				26140				SET THE EXPONENT TO NORMALIZE CORRECTLY
				56160		MVI	M,270	
666				26180		PUSH	PSW	SAVE THE SIGN
667				59500		CM	DINTA	SUBTRACT 1 FROM LO IF NUMBER IS NEGATIVE
				56550		MVI	A,270	IGET HOW MANY BITS WE HAVE TO SHIFT OUT
669				26240		SUB	B	AGUITET BUCH GUTLI
670				56560		CALL	DSHFTR	SHIFT THEM OUT!!
671				56580		POP	PSW	GET THE SIGN BACK
672				26300		CM	DROUNA	IF NUMBER WAS NEGATIVE, ADD ONE
673				26320		XRA	A	IPUT A ZERO IN THE EXTRA LO BYTE SO WHEN
674				26340		STA	DFACLO-1	WE NORMALIZE, WE WILL SHIFT IN ZEROS
675				26360		POP	PSW	IF WE WERE CALLED FROM FOUT, DON'T NORMALIZ
676				26380		RNC		; JUST RETURN
677				26400		JMP	DNORML	RE-FLOAT THE INTEGER
678				26420				
679				26440	DINTA:		H, DFACLO	SUBTRACT ONE FROM FAC, GET POINTER TO LO
680				26460	DINTA1:	MOV	A, M	JGET A BYTE OF FAC
681				26480		DCR	M	SUBTRACT ONE FROM IT
682				26500		ORA	A	CONTINUE ONLY IF THE BYTE USED TO BE ZERO

•

•

•

•

•

•

•

•

• • • • •

.

•

•

MATHPK	FOR BASI	C MCS 8080	GATES/	ALLEN/DAVIDOFF	MACRO	47(113)	06:09	27-AUG-75	PAGE	9=3
F4	MAC	23=AUG=64	06:08	GREATEST	INTEG	ER FUNC	TION			

1683	26520	INX	н	INCREMENT POINTER TO NEXT BYTE
1684	26540	JZ	DINTAL	CONTINUE IF NECESSARY
1685	26560	RET>		JALL DONE
1686	26580 PAGE			

```
MATHPK FOR BASIC MCS 8080 GATES/ALLEN/DAVIDOFF MACRO 47(113) 06:09 27-AUG-75 PAGE 10 F4 MAC 23-AUG-64 06:08 INTEGER ARITHMETIC ROUTINES
                                                                                                                    SUBTTL INTEGER ARITHMETIC ROUTINES
                                                                                                 26600
                                                                                                                                       INTEGER AKITHMETIC ROUTINES
MULDINAS_LENGTH=2><
;THO BYTE UNSIGNED INTEGER MULTIPLY
; (HL):=(BC)*(DE)
;A,D,E,H,L ARE CHANGED
LXI H,SCODE ;ZERO PRODU
     1688
1689
1690
1691
                                                                                                 26620
26640
26660
26680
                 001476* 021000
001477* 300000
001504* 000000
001501 001000
001501 001000
001502* 001000
001502* 001000
001502* 001000
001502* 001000
001511* 001000
001511* 001000
001515* 001000
001515* 001000
001515* 001000
001515* 001000
     1692
                                                         000041
                                                                                                 26700
                                                                                                                  DMULT: LXI
                                                                                                                                                                                                 ZERO PRODUCT REGISTERS
                                                         001153*
001472*
000170
     1693
1694
1695
1696
1697
1698
1699
1700
                                                                                                                                                                                                 ;CHECK IF (BC) IS ZERO
;IF SO, JUST RETURN, (HL) IS ALREADY ZERO
;THIS IS DONE FOR SPEED
;SET UP A COUNT
                                                                                                26720
                                                                                                                                       MOV
                                                                                                                                                          A,B
                                                                                                26740
26760
26780
                                                          192888
                                                                                                                                       ORA
                                                         000261
000310
000076
000020
                                                                                                                                       RZ
                                                                                                                                                         A, 20
                                                                                                26820
                                                                                                                  DMULT1: DAD
                                                                                                                                                                                                 ; ROTATE (HL) LEFT ONE ; CHECK FOR OVERFLOW, IF SO,
                                                          000051
                                                                                                                                                           H
BSERR##
     1701
1702
1703
                                                         000332
000000
001477
                                                                                                                                       XCHG
DAD
XCHG
JNC
                                                                                                26840
                                                                                                                                                                                                 ; BAD SUBSCRIPT (BS) ERROR
;ROTATE (DE) LEFT ONE
     1704
                                                          000353
                                                         000051
000353
000322
                                                                                                26860
     1706
1707
1708
                                                                                                                                                          DMULTZ
                                                                                                                                                                                                JADD IN (BC) IF HO WAS 1
                                                         001524
     1709
                  001517 000000
001520 001000
001521 001000
001522 000000
001523 000000
001525 001000
001525 001000
001525 000000
001527 000000
001527 000000
                                                         001510
     1710
1711
1712
1713
                                                                                                                                       DAD
                                                                                                                                                           BSERR
                                                                                                                                                                                                ICHECK FOR OVERFLOW
                                                         001510*
                                                         001516
                                                                                                                  DMULTE: DCR
                                                                                                26960
                                                                                                                                                                                                ISEE IF DONE
                                                                                                                                                          DHULT1
                                                         001506
     1716
                                                         001522
     1718
1718
1719
1720
1721
                                                         000311
                                                                                                27000
                                                                                                                                      RET>
                                                                                                                                                                                                TALL DONE
                                                                                                                                      LENGTH-2.4
                                                                                                27060
     1722
1723
1724
1725
                                                                                                27080
27100
27120
27120
27140
27160
27180
                                                                                                                   COMMENT X
INTEGER ARITHMETIC CONVENTIONS
                                                                                                                   INTEGER VARIABLES ARE 2 BYTE, SIGNED NUMBERS THE LO BYTE COMES FIRST IN MEMORY
     1726
1727
1728
1729
                                                                                                                  CALLING CONVENTIONS:
FOR ONE ARGUMENT FUNCTIONS:
FOR THE ARGUMENT IS IN (HL), THE RESULT IS LEFT IN (HL)
FOR THE ARGUMENT IS IN (DE)
THE SECOND ARGUMENT IS IN (HL)
THE RESULT IS LEFT IN (HL)
IF OVERFLOW OCCURS, THE ARGUMENTS ARE CONVERTED TO SINGLE PRECISION HER IN INC. THE ARGUMENTS ARE CONVERTED AT FACLO+0,1
VALITYP(INTEGER) = 2
VALITYP(INTEGER) = 2
                                                                                                27220
     1730
1731
1732
1733
                                                                                                27240
27260
27280
27300
                                                                                                27320
27340
27360
27380
     1734
                                                                                                27400
```

•

•

.

.

6

.

•

.

•

•

.

.

.

.

. •

• .

. . .

.

F4	MAC 23-AUG-64 06:08 INTE					
1740	2744	10				
1741	2746	0		INTEGER	SUBTRIACTION	(HL) := (DE) = (HL)
1742	2748	30		1 ALTERS	A, B, C, D, E, H, L	
1743	2750	00	ISUB:	MOV	A, H	PEXTEND THE SIGN OF (HL) TO B
1744	2752	20		RAL		JGET SIGN IN CARRY
1745	2754	6		SBB	A	
1746	2756	0		MOV	B, A	
1747	2758	30		CALL	INEGHL	INEGATE (HL)
1748	2768	00		MOV	A,C	JGET A ZERO
1749	2768	20		SBB	В	NEGATE SIGN
1750	2764	10		JMP	IADDS	IGO ADD THE NUMBERS
1751	2766	0				
1752	2768	30				
1753	2779			INTEGER	ADDITION	(HL):=(DE)+(HL)
1754	2772				A, B, C, D, E, H, L	(,,,,
1755	2774		I ADD:	MOV	A,H	JEXTEND THE SIGN OF (HL) TO B
1756	2776			RAL		JGET SIGN IN CARRY
1757	2778			888	A	The same of the sa
1758	2786		IADDS:		B. A	ISAVE THE SIGN
1759	2782			PUSH	H	SAVE THE SECOND ARGUMENT IN CASE OF OVERFLOW
1760	2784			MOV	A,D	JEXTEND THE SIGN OF (DE) TO A
1761	2786			RAL		IGET SIGN IN CARRY
1762	2788			888	A	TOET OTHER THE CARRY
1763	2798				0	JADD THE TWO LO'S
1764	2792			ADC	8	JADD THE EXTRA HO
1765	2794			RRC	•	IIF THE LSB OF A IS DIFFERENT FROM THE MSB OF
1766	2796			XRA	н	; H, THEN OVERFLOW OCCURED
1767	2798			JP	POPPRT	INO OVERFLOW, GET OLD (HL) OFF STACK AND WE
1768	2808			• •	FOFFICE	; ARE DONE
1769	28085			PUSH	В	JOVERFLOW SAVE EXTENDED SIGN OF (HL)
1770	2804			XCHG		JGET (DE) IN (HL)
1771	2806				CONSIH	FLOAT IT
1772	28085			POP	PSW	JGET SIGN OF (HL) IN A
1773	2810			POP	Н	IGET OLD (HL) BACK
1774	2812			CALL	PUSHF	PUT FIRST ARGUMENT ON STACK
1775	2814			XCHG	rushir	PUT SECOND ARGUMENT IN (DE) FOR FLOATR
1776	2816			CALL	INEGAD	FLOAT IT
1777	2818			POPR	INCHAU	
1778	2828				FADD	JGET FIRST ARGUMENT OFF STACK
1779	2828			JHF	PAUD	ADD THE TWO NUMBERS USING SINGLE PRECISION
1780	2824					
						400 A 4 - 40 E 4 - 400 A
1781	2826				MULTIPLICATION	(HL):=(DE)*(HL)
1782	2828				A, B, C, D, E, H, L	
1783	2830		MULT:	PUSH	H D	ISAVE SECOND ARGUMENT IN CASE OF OVERFLOW
1784	2832					SAVE FIRST ARGUMENT
1785	2834				IMULDY	FIX UP THE SIGNS
1786	2836				8	SAVE THE SIGN OF THE RESULT
1787	2838				В,Н	(COPY SECOND ARGUMENT INTO (BC)
1788	2842				C,L	
1789	2842				H, SCODE	ZERO (HL), THAT IS WHERE THE PRODUCT GOES
1790	2844			MVI	A,20	SET UP A COUNT
1791	2846		MULT1:		н	ROTATE PRODUCT LEFT ONE
1792	2848	80		JC	IMULTS	CHECK FOR OVERLEOW

MATHPK FOR BASIC MCS 8080 GATES/ALLEN/DAVIDOFF MACRO 47(113) 06:09 27-AUG-75 PAGE 10-1

.

MA	THPK FOR BAS	IC MCS 8080	GATES/	ALLEN/DAVIDOFF	MACRO	47(113)	06:09	27-AUG-75	PAGE	10-2	
F4	MAC	23-AUG-64				METTE PO					

1880	•	F4 MAC	23-AUG-64 06:08	INTEGER	ARITHME	TIC ROUT	INES	
1794				28500		XCHG		PROTATE FIRST ARGUMENT LEFT ONE TO SEE IF
1795 28560 JNC 1 HULT2 JOON*T ADD IN ANYTHING 1796 28560 JNC 1 HULT2 JOON*T ADD IN ANYTHING 1797 28560 JNC 1 HULT3 JCR I HULT5 JCHEK FOR DVERLFOW 1799 28560 JNC 1 HULT3 JCR I HULT5 JCHEK FOR DVERLFOW 1799 28560 JNZ 1 HULT2 JCR I HULT3 JCR I HULT1 JNC, DO IT AGAIN 1801 28660 POP B JKE ARE DONE, GET SIGN OF RESULT 1802 28560 JNC 1 HULT3 JNZ 1 HULT1 JNC, DO IT AGAIN 1802 28560 JNC 1 HULT3 JNZ 1 HULT1 JNC, DO IT AGAIN 1803 28760 JHLDIVA DV A, M JENTAY FROM IDIV, IS RESULT, GET, 327687 1804 28760 JNC 1 HULT3 JT IS, CHECK FOR SPECIA CASE OF 32768 JRC 1 HULT3 JNC 1 HULT3 JT IS, CHECK FOR SPECIA CASE OF 32768 JRC 1 HULT3 JNC 1 HUL	•			28520		DAD	н	
1796		1795		28540		XCHG		
1797				28560		JNC	INULTE	IDON'T ADD IN ANYTHING
1798 28600 JUL J	•			28580		DAD	В	
1888				28600		JC	IMULT5	
1880				58650	IMULT2:	DCR	A	ARE WE DONE?
1881 28668	•			28640		JNZ	INULT1	INO. DO IT AGAIN
1882 28668						POP	В	INE ARE DONE, GET SIGN OF RESULT
1803						POP	D	IGET ORIGINAL FIRST ARGUMENT
1885 28728	•				IMLDIV:		A,H	
1896 28768 PUP D FRESULT IS OK, GET SECOND ARGIMENT OFF STACK 1807 28768 MOV A, B JOET THE SIGN OF RESULT IN A 1808 28868 MOV A, B JOET THE SIGN OF RESULT IN A 1809 28828 IMULTSI XRI 288 IS RESULT 32768, THE RESULT IF NECESSARY 1810 28848 DRA L INDIEST IF NECESSARY 1811 28868 JZ IMULTSI 15 RESULT 32768, THE RESULT IF NECESSARY 1811 28868 JZ IMULTSI 15 RESULT 32768, THE RESULT IF NECESSARY 1812 28868 XAD 1808,081 FIXI 15, GT, 32766, HE MAVE OVERFLUM 1813 28988 XAD 1808,081 FIXI 15, GT, 32766, HE MAVE OVERFLUM 1815 28988 XAD 1808,081 FIXI 15, GT, 32766, HE MAVE OVERFLUM 1815 28988 XAD 1808,081 FIXI 15 POP NECESSARY 1815 XAD 1815							A	
1889 28788 PUP D RESULT IS DR. EST SECTION ASSUMENT OFF STACK								IT IS, CHECK FOR SPECIAL CASE OF #32768
1606 28620	• II.,							FRESULT IS OK, GET SECOND ARGUMENT OFF STACK
1009 20020 MULT31 XRI 200								IGET THE SIGN OF RESULT IN A
1919 2006 1001 2016 1001 2016 1001 2016 1001 2016 1001	. 11							INEGATE THE RESULT IF NECESSARY
1011 20800 JZ	•				IMULT3:		200	118 RESULT 32768?
1011 28860 JZ							L	; NOTE; IF WE GET HERE FROM IDIV, THE RESULT
1015 2008 1010 1009,001 1711 1911 2004 1011 101	_						IMULT4	HUST BE 32768, IT CANNOT BE GREATER
1814 28928 INULTS POP B JOET SIGN OF RESULT OFF STACK 1815 28948 POP H JOET THE ORIGINAL FIRST ARGUMENT 1816 28968 POP H JOET THE ORIGINAL FIRST ARGUMENT 1817 28988 POP H JOET THE ORIGINAL SECOND ARGUMENT 1818 24928 CALL CONSIH FLOAT IT 1819 24928 CALL CONSIH FLOAT TO FIRST ARGUMENT 1821 29868 POP H JOET FLOAT SECOND ARGUMENT 1821 29868 JAPP FMULT! POPR JOET THE ARGUMENT OFF STACK, ENTRY FROM POLYX 1822 29888 JAPP FMULT! POPR JOET THE ARGUMENT OFF STACK, ENTRY FROM POLYX 1823 29888 INULT14 HOV A, B JIS RESULT *\$2756 DK =\$327687 1824 29188 ONA A JOET THE ARGUMENT OFF STACK, ENTRY FROM POLYX 1825 29188 POP B JOISCARD ORIGINAL SECOND ARGUMENT 1826 29188 POP B JOISCARD ORIGINAL SECOND ARGUMENT 1826 29188 POP B JOISCARD ORIGINAL SECOND ARGUMENT 1826 29188 POP JIT IS POSITIVE, SAVE REMAINDER FOR MOD 1827 29188 POP O JOET THOUSE OF THE ORIGINAL SECOND ARGUMENT 1829 29288 POP O JOET THOUS OF THE ORIGINAL SECOND ARGUMENT 1829 29288 POP O JOET THOUS AND REMAINDER FOR MOD 1831 29288 POP O JOET THOUS AND REMAINDER FOR MOD 1833 29288 JAPP HES JOEC TO JOET SETS AND REMAINDER FOR MOD 1834 29288 JAPP HES JOEC TO JOET SETS AND REMAINDER DACK 1835 29288 JAPP HES JOEC TO JOET SETS AND REMAINDER JOET SETS A	90.							IT IS .GT. 32768, WE HAVE OVERFLOW
1615 20940								
1616 28968	110				IMULTS:		8	
1017 20900	-						н	
1616 29808								
1619 1820 29968 FMUTTI PUPR IGET FIRST ARGUMENT OFF STACK, ENTRY FROM POLYX 1821 1822 29060 JMP FMUTTI PUPR IGET FIRST ARGUMENT OFF STACK, ENTRY FROM POLYX 1822 29060 JMP FMULT MULTIPLY THE ARGUMENT OFF STACK, ENTRY FROM POLYX 1822 29080 IMULTAI MOV A,B IIS RESULT *32766 OR *327687 1824 29180 ONA A GET ITS SIGN 1825 29180 PUP B JUISCARO ORIGINAL SECOND ARGUMENT 1826 PUP B JUISCARO ORIGINAL SECOND ARGUMENT 1827 29180 PUP B JUISCARO ORIGINAL SECOND ENCATIVE, IT IS OK 1827 29180 PUP B JUISCARO ORIGINAL SECOND ENCATIVE, IT IS OK 1829 29280 PUP D JUISCARO ORIGINAL SECOND ENCATIVE, IT IS OK 1829 29280 PUP D JUISCARO ORIGINAL SECOND ENCATIVE, IT IS OK 1829 1829 1833 29280 PUP NEG JUISCARO ORIGINAL SECOND ENCATIVE, IT IS OK 1831 29280 1833 29280 JAPP NEG JUISCARO ORIGINAL SECOND ENCATIVE, IT IS OK 1833 29280 JAPP NEG JUISCARO ORIGINAL SECOND ENCATIVE, IT IS OK 1833 29280 JAPP NEG JUISCARO ORIGINAL SECOND ENCATIVE, IT IS OK 1833 29280 JAPP NEG JUISCARO ORIGINAL SECOND ENCATIVE, IT IS OK 1833 29280 JAPP NEG JUISCARO ORIGINAL SECOND ENCATIVE, IT IS OK 1833 29280 JAPP NEG JUISCARO ORIGINAL SECOND ENCATIVE, IT IS OK 1834 PUP NEG JUISCARO ORIGINAL SECOND ENCATIVE, IT IS OK 1835 PUP NEG JUISCARO ORIGINAL SECOND ARGUMENT 1836 29380 JAPP NEG JUISCARO ORIGINAL SECOND ARGUMENT 1836 29380 JAPP NEG JUISCARO ORIGINAL SECOND ARGUMENT 1837 PUP NEG JUISCARO ORIGINAL SECOND ARGUMENT 1839 PUP NEG JUISCARO ORIGINAL SECOND ARGUMENT 1839 29380 JAPP NEG JUISCARO ORIGINAL SECOND ARGUMENT 1839 PUP NEG JUISCARO ORIGINAL SECOND ARGUMENT 1830 PUP NEG JUISCARO ORIGINAL SECOND ARGUMENT 1830 PUP NEG JUISCARO ORIGINAL SECOND ARGUMENT 1830 PUP NEG JUISCARO ORIGINAL SECOND ARGUMENT 1840 PUP NEG JUISCARO ORIGINAL ORIGINAL ORIGINAL ORIGINAL ORIGINAL ORIGINAL ORIGINAL ORIGINAL O	_							
1920	7 n.,							
1821 2988							CONSIH	
1822 2988	, U_			29040	FMULTT:	POPR		GET FIRST ARGUMENT OFF STACK, ENTRY FROM POLYX
1623	-			20212				
1026					TMIN TO .			
1825 29128 POP B JOISCARD ORIGINAL SECOND ARGUMENT 18266 29148 RM FITH RESULT SHOULD BE MEGATIVE, IT IS OK 1827 29169 PUSH D FITH RESULT SHOULD BE MEGATIVE, IT IS OK 1828 29129 CALL CONSIH FILOAT -32766 DEGATIVE, SAVE REMAINDER FOR MOD 1828 POP D FIGHT MOD'S REMAINDER BACK 1831 29280 FOR POP D FIGHT MOD'S REMAINDER BACK 1832 29280 FINTEGER DIVISION (HL):*(DE)/(HL) 1833 29280 FINTEGER DIVISION (HL):*(DE)/(HL) 1833 29280 FINTEGER DIVISION (HL):*(DE)/(HL) 1835 29380 FINTEGER DIVISION (HL):*(DE)/(HL) 1835 29380 FINTEGER DIVISION (HL):*(DE)/(HL) 1837 29380 FINTEGER DIVISION BY ZERO 1837 29380 JZ DOBERR FINTEGER FOR DIVISION BY ZERO 1837 29380 JZ DOBERR FINTEGER FOR DIVISION BY ZERO 1837 29380 JZ DOBERR FINTEGER FOR DIVISION BY ZERO 1839 29480 CALL INCOME FOR FOR FINTEGER SIGNS FINE SIGN	_				INUL 14;			
1826 29188 RM								
1827 29188 PUSH D 121 IS POSITIVE, SAVE REMAINDER FOR MOD 1828 29188 CALL CUNSIH FFLOAT -32788 REMAINDER FOR MOD 1829 29280 POP D 16ET MOD'S REMAINDER BACK 1830 29228 JHP NEG INCESTED TO THE STATE OF THE RESULT OF THE STATE OF							•	
1828 29180							0	
1829 29288 PUP D JOET MOD'S REMAINDER BACK 1830 29228 JMP MEG JNEGATE -32766 TO GET 32768, ME ARE DONE 1831 29288 JMP MEG JNEGATE -32766 TO GET 32768, ME ARE DONE 1832 29288 JMP MEG JMEGATE -32766 TO GET 32768, ME ARE DONE 1833 29288 JMEGATE JMEGATE JMEGATE JMEGATE JMEGATE JMEGATE 1834 29388 JALTERS A,B,C,D,E,H,L JCHECK FOR DIVISION BY ZERO 1835 29388 JULY MUV A,H JCHECK FOR DIVISION BY ZERO 1836 29388 JZ DV8FR JME HAVE DIVISION BY ZERO 1839 29488 CALL JMULOV JFIX UP THE SIGNS 1849 29428 PUSH B JSAVE THE SIGN 1841 29488 XCHG JGET DERONINATOR IN (HL) 1842 29480 MUV B,H JSAVE MEGATED DENOMINATOR IN (BC) 1844 29588 MOV C,L 1844 29588 MOV C,L 1845 29588 MOV C,L 1846 29588 MOV C,L 1847 JMEGATE DENOMINATOR IN (BC) 1848 29588 MOV C,L 1849 JAVEN MEGATED DENOMINATOR IN (BC) 1840 29588 MOV C,L 1841 29588 MOV C,L 1842 29588 MOV C,L 1844 29588 MOV C,L 1845 JMEGATE								
1838 29280								
1631 29260 1632 29260 1633 29260 1634 29260 JINTEGER DIVISION (HL)1#(DE)/(HL) 1634 29360 JARMAINDER IS IN (DE), QUOTIENT IN (HL) 1635 29340 IDIVI MOV A, H JCHECK FOR DIVISION BY ZERO 1636 29340 ONA L 1637 29360 ONA L 1638 29360 ONA L 1639 29480 CALL INDIVI FIX UP THE SIGNS 1640 29420 PUSH B SAVE THE SIGN S IDIVI THE SIGN S IDIVI ON SAVE THE SIGN SAVE THE SIGN S IDIVI ON SAVE THE SIGN S IDIVI ON SAVE THE SIGN SAVE THE SIGN S IDIVI ON SAVE THE SAVE THE SIGN S IDIVI ON SAVE THE	•							THECATE - 73749 TO CET 73749 HE ADE DONE
1832 29288						JHP.	HEG	INEGALE -32/00 TO GET 32/00, WE ARE DUNE
1833								
1836 29368	•					INTEGE	POTVISTON	(41.10=(05)((41.1
1835								CHOTIENT IN (HL)
1836						TALTEDS	A.B.C.O.F.H.I.	GOOTENT IN (HL)
1837 29588 ONA L 1838 29388 JZ DV8ERR ; IME HAVE DIVISION BY ZERD[: 1839 29488 CALL IMULDY FFIX UP THE SIGNS 1848 29428 PUSH B SAVE THE SIGN OF THE RESULT 1841 29488 XCHG SGET DERORITATOR IN (HL) 1842 29488 MUY B,H INEGATE IT 1843 29488 MUY B,H SAVE NEGATED DENOMINATOR IN (BC) 1844 29588 MUY C,L	•				Intv.			CHECK FOR DIVISION BY 7580
1838 29388 JZ DVBERR								TORECK FOR DIVISION BY ZERO
1839 29488 CALL IMULOV FIX UP THE SIGNS 1848 29428 PUSH 5184 THE RESULT 1841 29488 XCHG 16ET DERORITATOR IN (HL) 1842 29480 CALL INEGHL INEGATE IT 1843 29488 MOV B,H ISAVE NEGATED DENOMINATOR IN (BC) 1844 29588 MOV C,L								THE MAVE DIVISION BY TERRIT
1848 29428 PUSH 8 JSAVE THE SIGN OF THE RESULT 1841 29440 XCHG JGET DEMORINATOR IN (HL) 1842 29408 CALL INEGHL INEGATE IT 1843 29408 MUV B,H JSAVE NEGATED DENOMINATOR IN (BC) 1844 29580 MUV C,L	•							IFTY UP THE STONS
1841 29480 XCMG 16ET DEROMINATOR IN (HL) 1842 29480 CALL INEGHL INEGATE IT 1843 29480 MOV B,H ISAVE NEGATED DENOMINATOR IN (BC) 1844 29580 MOV C,L								
- 1842 29460 CALL INEGHL INEGATE IT 1843 29460 MOV B,M ISAVE NEGATED DENOMINATOR IN (BC) 1844 29560 MOV C,L							•	
1843 29480 MOV B,H ISAVE NEGATED DENOMINATOR IN (BC) 1844 29500 MOV C,L							INEGHL	
1844 29500 MOV C,L								
								TONIE MEDITED DEMONISMENT IN (DC)
TARRO WILLIAM TO THE GOTTING TO THE CONTRACTION								TERO WHERE WE DO THE SUBTRACTION

1846	29540		MVI	A,21	SET UP A COUNT
847	29566		PUSH	PSW	ISAVE IT
848	29586		ORA	A	CLEAR CARRY
849	29600		JMP	IDIV3	;GO DIVIDE
850	29626		PUSH	PSW	SAVE COUNT
851	29640		PUSH	н	; SAVE (HL) I.E. CURRENT NUMERATOR
352	29666		DAD	В	SUBTRACT DENOMINATOR
353	29689		JNC	IDIVS	; WE SUBTRACTED TOO MUCH, GET OLD (HL) BAC
854	29700		POP	PSW	THE SUBTRACTION WAS GOOD, DISCARD OLD (H
355	29729		STC		; NEXT BIT IN QUOTIENT IS A ONE
356	29746		XWD	1000,076	"MVI A" OVER NEXT BYTE
557	29766	IDIV2:	POP	н	JIGNORE THE SUBTRACTION, WE COULDN'T DO I
358	29786	IDIV3:	MOV	A.E	ISHIFT IN THE NEXT QUOTIENT BIT
359	29809		RAL		
360	29826		MOV	E,A	
361	29846		MOV	A,D	SHIFT THE HO
362	29866		RAL		Your Time no
363	29886		MOV	D, A	
364	29900		MOV	A,L	SHIFT IN THE NEXT BIT OF THE NUMERATOR
365	29926		RAL	-,-	A SULL I THE MEXT BIT OF THE MOMERATOR
866	29946		MOV	L, A	
867	29968		MOV	A, H	JOO THE HO
368	29986		RAL	~,"	/UU THE HU
869	3000		MOV	H.A	ISAVE THE HO
870	30026		POP	PSW	
371	30040		DCR	Pow	GET COUNT BACK
372	30066		JNZ	IDIVI	TARE WE DONE?
373	30080		XCHG	10171	NO, DIVIDE AGAIN
374	30100		POP	В	GET QUOTIENT IN (HL), REMAINDER IN (DE)
375	30120		PUSH	0	JGET SIGN OF RESULT
376	30140		JMP		SAVE REMAINDER SO STACK WILL BE ALRIGHT
			JMP	IMPDIA	TCHECK FOR SPECIAL CASE OF 32768
377	30166				
378	30188				
379	30200			ADY TO MULTIPLY	OR DIVIDE
880	30226		IALTERS	A, B, C, D, E, H, L	
881	30249			A,H	JGET SIGN OF RESULT
588	30266		XRA	D	
883	30288		MOV	B, A	ISAVE IT IN B
384	30300		CALL	INEGH	INEGATE SECOND ARGUMENT IF NECESARY
885	30320		XCHG		PUT (DE) IN (HL), FALL IN AND NEGATE FIR
886	30346				ARGUMENT IF NECESSARY
387	30368				
888	30386				
389	30400		INEGATE	H.L	
190	30428		TALTERS	A,C,H,L	
91	30448	INEGH:	MOV	A, H	JGET SIGN OF (HL)
92	30468	INEGA:	ORA	A	SET CONDITION CODES
93	30488		RP		THE DON'T HAVE TO NEGATE, IT IS POSITIVE
94	30508	INEGHL:		A	CLEAR A
95	30520	THE GHL	MOV		
96	30548		SUB	C, A	STORE A ZERO (WE USE THIS METHOD FOR ISU
				٠.	NEGATE LO
897	30560		MOV	LA	SAVE IT
898	30580		MOV	A,C	JGET A ZERO BACK