

**DEVICE REGISTER ADDRESSES:**

Device	Registers	Address	Int Vec-tor	Prior-ity	NPR
CD11	Card Reader, high speed status & control column count current address data	(CDST) 777 160 (CDCC) 777 162 (CDBA) 777 164 (CDDB) 777 166	230	BR4	X
CR11	Card Reader status buffer, 12-bit char buffer, 8-bit char	(CRS) 777 160 (CRB1) 777 162 (CRB2) 777 164	230	BR6	
KW11-L	Line Clock	(LKS) 777 546	100	BR6	
KW11-P	Programmable Clock control & status count set buffer counter	772 540 772 542 772 544	104	BR6	
LA30, LA36, LT33, VT05, VT50	Console Terminal keyboard/reader status keyboard/reader buffer printer/punch status printer/punch buffer	777 560 777 562 777 564 777 566	60 64	BR4 BR4	
LP11, LS11, LV11	Line Printer printer status printer data	777 514 777 516	200	BR4	
PC11	Paper Tape reader status reader buffer punch status punch buffer	(PRS) 777 550 (PRB) 777 552 (PPS) 777 554 (PPB) 777 556	70 74	BR4 BR4	
RK11/RK05	Disk Cartridge drive status error control & status word count current bus adrs disk address data buffer	(RKDS) 777 400 (RKER) 777 402 (RKCS) 777 404 (RKWC) 777 406 (RKBA) 777 410 (RKDA) 777 412 (RKDB) 777 416	220	BR5	X
RF11/RS11	Disk disk control status word count current mem adrs disk address disk adrs ext & error disk data buffer maintenance adrs of disk segment	(DCS) 777 460 (WC) 777 462 (CMA) 777 464 (DAR) 777 466 (DAE) 777 470 (DBR) 777 472 (MA) 777 474 (ADS) 777 476	204	BR5	X
RP11-C/Disk, RP03, RPR11/RPR02	device status error control status word count bus address cylinder address disk address maintenance 1 maintenance 2 maintenance 3 selected unit cyl adrs silo memory	(RPDS) 776 710 (RPER) 776 712 (RPCS) 776 714 (RPWC) 776 716 (RPBA) 776 720 (RPCA) 776 722 (RPDA) 776 724 (RPM1) 776 726 (RPM2) 776 730 (RPM3) 776 732 (SUCA) 776 734 (SILO) 776 736	254	BR5	X
RX11/RX01	Floppy Disk command & status data buffer	(RXCS) 777 170 (RXDB) 777 172	264	BR5	

Device	Registers	Address	Int Vec-tor	Prior-ity	NPR
RJP04/RWP04/RP04	Disk control & status #1 word count UNIBUS address desired sector/track address RH11 control & status drive status error register #1 attention summary look ahead data buffer maintenance register drive type serial number offset desired cylinder current cylinder error #2 error #3 ECC position ECC pattern bus address ext control & status #3	(RPCS1) 776 700 (RPWC) 776 702 (RPBA) 776 704 (RPDA) 776 706 (RPCS2) 776 710 (RPDS) 776 712 (RPER1) 776 714 (RPAS) 776 716 (RPDA) 776 720 (RPDB) 776 722 (RPMR) 776 724 (RPDT) 776 726 (RPSN) 776 730 (RPOF) 776 732 (RPDC) 776 734 (RPCC) 776 736 (RPER2) 776 740 (RPER3) 776 740 (RPEC1) 776 744 (RPEC2) 776 746 (RPBAE) 776 750† (RPCS3) 776 752†	254*	BR5**	X
RJS04/RWS04/RS04/RJS03/RWS03/RS03	Disk control & status #1 word count UNIBUS address desired disk adrs RH11 control & status drive status error attention summary look ahead data buffer maintenance drive type bus address ext control & status #3	(RSCS1) 772 040 (RSWC) 772 042 (RSBA) 772 044 (RSDA) 772 046 (RSCS2) 772 050 (RSDS) 772 052 (RSER) 772 054 (RSAS) 772 056 (RSLA) 772 060 (RSDM) 772 062 (RSMR) 772 064 (RSDT) 772 066 (RSBAE) 772 070† (RSCS3) 772 072†	204*	BR5**	X
TJU16/TWU16/TU16	Tape control & status #1 word count UNIBUS address frame count RH11 control & status drive status error attention summary check character data buffer maintenance drive type serial number tape control bus address ext control & status #3	(MTSC1) 772 440 (MTWC) 772 442 (MTBA) 772 444 (MTFC) 772 446 (MTCS2) 772 450 (MTDS) 772 452 (MTER) 772 454 (MTAS) 772 456 (MTCK) 772 460 (MTDB) 772 462 (MTMR) 772 464 (MTDT) 772 466 (MTSN) 772 470 (MTTC) 772 472 (MTBAE) 772 474† (MTCS3) 772 476†	224*	BR5**	X
TMA11/TU10, TS03	Magnetic Tape status command byte record cntr current mem adrs data buffer read lines	(MTS) 772 520 (MTC) 772 522 (MTBRC) 772 524 (MTCMA) 772 526 (MTD) 772 530 (MTRD) 772 532	224	BR5	X

\*Jumper Selectable  
\*\*Plug Selectable  
† Implemented on PDP-11/70 only

Device	Registers	Address	Int Vec-tor	Prior-ity	NPR
TA11	Cassette command & status data buffer	(TACS) 777 500 (TADB) 777 502	260	BR6	
TC11/TU56	DECtape control & status command word count bus address data	(TCST) 777 340 (TCCM) 777 342 (TCWC) 777 344 (TCBA) 777 346 (TCDT) 777 350	214	BR6	X

**BM873-YA BOOTSTRAP LOADER:**

Starting Address	Device
773 000	RF11
773 010	RK11
773 020	Transfer to address contained in Switch Register
773 030	TC11
773 050	TM11
773 100	RP11
773 144	RC11
773 210	ASR paper tape reader
773 230	TA11
773 312	PC11

**BM873-YB BOOTSTRAP LOADER:**

Starting Address	Device
773 000	RJS03/RJS04
773 002	RIS03/RJS04
773 030	RK11
773 032	RK11
773 070	TC11
773 110	TM11
773 136	RF11
773 150	TJU16
773 212	RC11
773 320	RJP04
773 322	RJP04
773 344	Transfer to address in console switch register
773 350	RP11
773 352	RP11
773 510	KL11/DL11
773 524	TA11
773 526	TA11
773 620	PC11

**PDP-11/70 BOOTSTRAP LOADER:**

Starting Address 17 765 000

Device Type:	1	2	3	4	6	7	10	11
	TM11	TC11	RK11	RP11	TWU16	RWP04	RWS03/4	RX11

**ABSOLUTE LOADER**

Starting Address: — 500  
Memory Size: —  
4K 017  
8K 037  
12K 057  
16K 077  
20K 117  
24K 137  
28K 157  
(or larger)

**BOOTSTRAP LOADER**

Address	Contents	Address	Contents
— 744	016 701	— 764	000 002
— 746	000 026	— 766	— 400
— 750	012 702	— 770	005 267
— 752	000 352	— 772	177 756
— 754	005 211	— 774	000 765
— 756	105 711	— 776	177 560 (TTY)
— 760	100 376		or 177 550 (PC11)
— 762	116 162		
773 000	Paper Tape Bootstrap		
773 100	Disk/DECtape Bootstrap		
773 200	Card Reader Bootstrap		
773 300	Cassette Bootstrap		
773 400	Floppy Disk Bootstrap		

**MR11-DB BOOTSTRAP LOADER:**

Starting Address	Device
773 100	RF11
773 110	RK11
773 120	TC11
773 136	TM11
773 154	RP11
773 220	RC11

**7-BIT ASCII CODE:**

Octal Code	Char	Octal Code	Char	Octal Code	Char	Octal Code	Char
000	NUL	040	SP	100	@	140	\
001	SOH	041	!	101	A	141	a
002	STX	042	"	102	B	142	b
003	ETX	043	#	103	C	143	c
004	EOT	044	\$	104	D	144	d
005	ENQ	045	%	105	E	145	e
006	ACK	046	&	106	F	146	f
007	BEL	047	'	107	G	147	g
010	BS	050	(	110	H	150	h
011	HT	051	)	111	I	151	i
012	LF	052	*	112	J	152	j
013	VT	053	+	113	K	153	k
014	FF	054	,	114	L	154	l
015	CR	055	-	115	M	155	m
016	SO	056	.	116	N	156	n
017	SI	057	/	117	O	157	o
020	DLE	060	0	120	P	160	p
021	DC1	061	1	121	Q	161	q
022	DC2	062	2	122	R	162	r
023	DC3	063	3	123	S	163	s
024	DC4	064	4	124	T	164	t
025	NAK	065	5	125	U	165	u
026	SYN	066	6	126	V	166	v
027	ETB	067	7	127	W	167	w
030	CAN	070	8	130	X	170	x
031	EM	071	9	131	Y	171	y
032	SUB	072	:	132	Z	172	z
033	ESC	073	;	133	[	173	{
034	FS	074	<	134	\	174	
035	GS	075	=	135	]	175	}
036	RS	076	>	136	^	176	~
037	US	077	?	137	_	177	DEL



**PROGRAMMING CARD**  
FOR FAMILY OF PDP-11 COMPUTERS



Mode	Name	Symbolic	Description
0	register	R	(R) is operand [ex. R2=%2]
1	register deferred	(R)	(R) is address
2	auto-increment	(R)+	(R) is adrs; (R) + (1 or 2)
3	auto-incr deferred	@(R)+	(R) is adrs of adrs; (R) + 2
4	auto-decrement	-(R)	(R) - (1 or 2); (R) is adrs
5	auto-decr deferred	@-(R)	(R) - 2; (R) is adrs of adrs
6	index	X(R)	(R) + X is adrs
7	index deferred	@X(R)	(R) + X is adrs of adrs

**PROGRAM COUNTER ADDRESSING:** Reg = 7

Mode	Name	Symbolic	Description
2	immediate	#n	operand n follows instr
3	absolute	@#A	address A follows instr
6	relative	A	instr adrs + 4 + X is adrs
7	relative deferred	@A	instr adrs + 4 + X is adrs of adrs

**LEGEND:**

Op Codes	Operations
■ = 0 for word/1 for byte	( ) = contents of
SS = source field (6 bits)	s = contents of source
DD = destination field (6 bits)	d = contents of destination
R = gen register (3 bits), 0 to 7	r = contents of register
XXX = offset (8 bits), +127 to -128	← = becomes
N = number (3 bits)	X = relative address
NN = number (6 bits)	% = register definition

Boolean	Condition Codes
Λ = AND	* = conditionally set/cleared
V = inclusive OR	- = not affected
∨ = exclusive OR	0 = cleared
~ = NOT	1 = set

**NOTE:**  
▲ = Applies to the 11/35, 11/40, 11/45 & 11/70 computers  
● = Applies to the 11/45 & 11/70 computers





NUMERICAL OP CODE LIST:

Table listing numerical op codes (00-07) and mnemonics (e.g., HALT, WAIT, ROR, MOV, etc.) with their corresponding op codes and instructions.

TRAP VECTORS: Table listing trap vectors (000-034) and their corresponding instructions and memory addresses.

SINGLE OPERAND: OPR dst

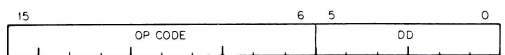


Table of single operand instructions including General (CLR, COM, INC, DEC, NEG, TST), Rotate & Shift (ROR, ROL, ASR, ASL, SWAB), and Multiple Precision (ADC, SBC, SXT).

DOUBLE OPERAND: OPR src, dst OPR src, R or OPR R, dst

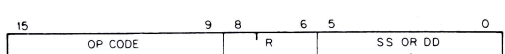
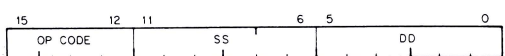


Table of double operand instructions including General (MOV, CMP, ADD, SUB), Logical (BIT, BIC, BIS), and Register (MUL, DIV, ASH, ASHC, XOR).

BRANCH: B -- location

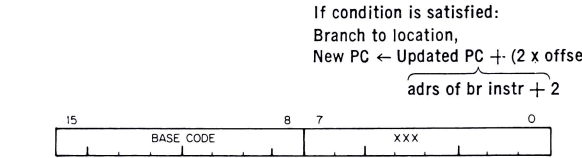


Table of branch instructions including BR, BNE, BEQ, BPL, BMI, BVC, BVS, BCC, BCS, Signed Conditional Branches (BGE, BLT, BGT, BLE), and Unsigned Conditional Branches (BHI, BLOS, BHIS, BLO).

JUMP & SUBROUTINE:

Table of jump and subroutine instructions including JMP, JSR, RTS, MARK, and SOB.

TRAP & INTERRUPT:

Table of trap and interrupt instructions including EMT, TRAP, BPT, IOT, RTI, and RTT.

MISCELLANEOUS:

Table of miscellaneous instructions including HALT, WAIT, RESET, NOP, SPL, MFPI, MTPPI, MFDP, and MTPD.

CONDITION CODE OPERATORS:

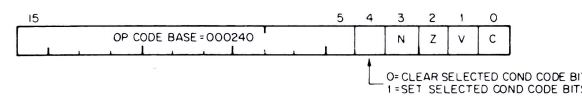


Table of condition code operators including CLC, CLV, CLZ, CLN, CCC, SEC, SEV, SEZ, SEN, SCC.

PROCESSOR REGISTER ADDRESSES:

Table of processor register addresses including Processor Status Word (PS) and Console Switches & Display Register.

PDP-11/45, 11/70 FLOATING POINT PROCESSOR:

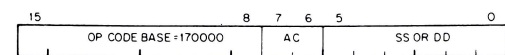


Table of floating point processor instructions including CFCC, SETF, SETI, SETD, SETL, LDFPS, STFPS, STST, CLRF, CLRD, TSTF, TSTD, ABSF, ABSD, NEGF, NEGD, MULF, MULD, MODF, MODD, LDF, LDD, SUBF, SUBD, CMPF, CMPD, STF, STD, DIVF, DIVD, STEXP, STCFI, STCFL, STCDI, STCDL, STCFD, STCDF, LDEXP, LDCIF, LDCID, LDCLF, LDCLD, LDCDF, LDCDF.

PDP-11/35, 11/40 FLOATING POINT UNIT:

Table of floating point unit instructions including FADD, FSUB, FMUL, and FDIV.

POWERS OF 2:

Table showing powers of 2 (n, 2^n) for n from 0 to 19.

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