TECH MEMO

a working paper

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LISP 1.5 FOR 360 COMPUTERS
TABLE OF ENTRY SPACE

ABSTRACT

This table gives mnemonics, full names, size, location,
and descriptions for all entries in LISP fixed space in
the first page of available core.

MNEMONIC	FULL NAME	NUMBER OF WORDS	ADDRESS	DESCRIPTION
FNLK	Function Link	32	ØX	Routine to implement the link when one function calls another. The location (address) of this routine is the LISP system origin.
STRT	Start	32	8ØX	Initial starting address of the LISP system. The routine at this address initializes some vital registers and then calls function (STRT . 122)
FCLK	Functional Link	32	1ØØX	Routine used to make program links when a functional call is made. A branch to here is generated by (FASTCALL ---)
FSLO	Slow Functional Link	32	18ØX	The routine at this address checks the functional variable to be sure the value is a function of the correct number of arguments. Then a branch to entry FCLK is made. A branch to FSLO is generated by (SLOWCALL ---), and by standard functional calls. The address of this routine is kept in AC4 (Register 6).
SORG	System Origin	1	2ØØX	Address of the LISP system origin and of entry FNLK. This value is generated by the routine in entry STRT and is also kept in the register SORG (Register 12). The normal value of SORG is 1ØØØØX.

MNEMONIC	FULL NAME	NUMBER OF WORDS	ADDRESS	DESCRIPTION
PSAV	Push Down Stack Pointer Save	1	2Ø4X	Function (TTYW . 124) saves the value of the PDP register (Register 13) in this entry. Since all LISP programs are saved under the time-sharing systems in the "Waiting-for-TTY" status, this entry will always contain the current PDP value when the program is saved. The routine at entry STRT restores the PDP register from this entry.
PRS3	Program Reference Space Page 3	1	2Ø8X	Address of start of third page of program reference space. The first 32 words of this space contains the "special unbind" routine. The value of this entry is also kept in register 8 which has two names: PRS3 and SPU.
PRS2	Program Reference Space Page 2	1	2ØCX	Address of start of second page of program reference space. The first 32 words of this space contain the "special bind" routine. The value of this entry is also kept in register 9 which has two names: PRS2 and SPB.
PRS	Program Reference Space Page 1	1	21ØX	Address of start of first page of program reference space. The first 32 words of this space contain the "function return" routine.

MNEMONIC	FULL NAME	NUMBER OF WORDS	ADDRESS	DESCRIPTION
				The value of this entry is also kept in register 16 which has two names: PRS and FNRT.
NTRY	Entry	1	214X	Base register for entries in high core fixed space. Start of garbage collector mark table.
PGON	PDS gone	1	218X	Address of end of usable push-down stack.
PDGC	PDS Garbage Collector	1	21CX	Absolute value of push-down-stack pointer at start of garbage collector. Marking from stack not done beyond this address.
CHO	Character Space Origin	1	22ØX	Address of first character-ID
CHE	Character Space End	1	224X	Address of next word after last character-ID
PRSO	PRS Origin	1	228X	Address of first word of program reference space page 1.
PR20	PRS Page 2 Origin	1	22CX	Address of first word of program reference space page 2.
PR30	PRS Page 3 Origin	1	23ØX	Address of first word of program reference space page 3.
PRSE	PRS End	1	234X	Address of next word after last word of program reference space.
FLO	Floating-Point Origin	1	238X	Address of first word of floating-point space.

MNEMONIC	FULL NAME	NUMBER OF WORDS	ADDRESS	DESCRIPTION
FLP	Floating-Point Pointer	1	23CX	Address of next available word of floating point space.
OFLP	Old Floating-Point Pointer	1	24ØX	Used by GC to save FLP before collecting garbage.
FLE	Floating Point End	1	244X	Address of first word after last word of floating point space.
INO	Integer Origin	1	248X	Address of first integer.
INP	Integer Pointer	1	24CX	Address of next available word of integer space.
OINP	Old Integer Pointer	1	25ØX	Used by GC to save INP before collecting garbage.
IBB	Integer Bit Boundary	1	254X	Address of floating quantum boundary between integer space and bit space.
BTP	Bit Pointer	1	258X	Address of next available pointer in bit space. This space stores octal and hexidecimal numbers.
OBTP	Old Bit Pointer	1	25CX	Used by GC to store BTP before collecting garbage.
BTO	Bit Origin	1	26ØX	Address of first word of bit space. Since this space grows toward system origin, this word is at the high core end of the space.
ARO	Array Origin	1	264X	Address of first word of array space.

MNEMONIC	FULL NAME	NUMBER OF WORDS	ADDRESS	DESCRIPTION
ARP	Array Pointer	1	268X	Address of next available word of array space.
OARP	Old Array Pointer	1	26CX	Used by GC to store ARP before collecting garbage.
AIB	Array Identifier Boundary	1	27ØX	Address of floating quantum boundary between array space and identifier space.
IDP	Identifier Pointer	1	274X	Address of next available word in identifier space.
OIDP	Old Identifier Pointer	1	278X	Used by GC to save IDP when collecting garbage.
IDE	Identifier Space End	1	27CX	Address of first word following last word of identifier space.
LSO	List Space Origin	1	28ØX	Address of first word of list (or node) space.
LSP	List Space Pointer	1	284X	Address of next available node (used by function CONS)
OLSP	Old List Space Pointer	1	288X	Used by GC to save LSP when collecting garbage.
LBB	List Space Binary Program Space Boundary	1	28CX	Address of floating quantum boundary between list (node) space and binary program space.
BPP	Binary Program Pointer	1	29ØX	Address of next available word of binary program space.

MNEMONIC	FULL NAME	NUMBER OF WORDS	ADDRESS	DESCRIPTION
OBPP	Old Binary Program Pointer	1	294X	Used by GC to save BPP before collecting garbage.
BPE	Binary Program Space End	1	298X	Address of first word following end of binary program space.
PDO	Push Down Stack Origin	1	29CX	Address of first word of push down stack.
PDE	Push Down Stack End	1	2AØX	Address of first word following end of push down stack.
PGO	Program Reference Space "B" Origin	1	2A4X	Address of first word of high core half of program reference space.
PGE	Program Reference Space "B" End	1	2A8X	Address of first word following last word of high core halt of program reference space.
FXO	Fixed Space Origin	1	2ACX	Address of first word of fixed space. This space has been used only for the garbage collector mark table, but may be extended to contain other items or tables.
FXE	Fixed Space End	1	2BØX	Address of first word following last word of fixed space.
IOO	Input/Output Origin	1	2B4X	First word of space initially intended for buffers of blocked I/O files. Now used by CONVERSE for many diverse purposes.

MNEMONIC	FULL NAME	NUMBER OF WORDS	ADDRESS	DESCRIPTION
IOE	Input/Output End	1	2B8X	Address of first word following last word of I/O space. Also address of first word following end of LISP core space.
TOPA	Top Address	1	2BCX	Highest LISP pointer that can be evaluated. All pointers higher than this represent small integers.
PRSF	PRS Free	1	2CØX	Start of chained set of all currently available words in PRS.
GIDS	Generated Identifiers	1	2C4X	Start of chained set of all current system generated identifiers.
QUOT	Quote Cells	1	2C8X	Start of chained set of all current quote cells.
ZERN	Number Zero	1	2CCX	Pointer representing the small integer zero. Same as (QUOTE Ø)
ONEN	Number One	1	2DØX	Pointer representing the small integer one. Same as (QUOTE 1)
SMLN	Smallest Number	1	2D4X	Absolute value of the smallest (negative) integer representable as a small integer.
BIGN	Biggest Number	1	2D8X	Absolute value of the largest integer representable as a small number.

MNEMONIC	FULL NAME	NUMBER OF WORDS	ADDRESS	DESCRIPTION
MASK	Mask	1	2DCX	Contains ØØØØFFFF Hex. Used to restore the mask register (RØ).
DPRS	Delta PRS	1	2EØX	Difference between address of PRS section A and PRS section B. Used to get the second word of any PRS pointer.
GCC	Garbage Collector Counter	1	2E4X	Counts up by one every time the garbage collector is entered.
INGC	In Garbage Collector	1	2E8X	Indexes stages of GC. Zero when not in GC. Used for reference and de-bugging only. Not read by the system.
GSTK	Garbage Collector Stack	1	2ECX	Number of bytes added to PDS for garbage collector.
NBBT	Number of Bytes in bit table	1	2FØX	Number of bytes in garbage collector mark table.
SACØ	Save ACØ	1	2F4X	Contents of ACØ (Register 2) saved here during garbage collection.
SAC2	Save AC2	1	2F8X	Contents of AC2 (Register 4) saved here during garbage collection.
SAC3	Save AC3	1	2FCX	Contents of AC3 (Register 5) saved here during garbage collection.

MNEMONIC	FULL NAME	NUMBER OF WORDS	ADDRESS	DESCRIPTION
SAV2	Save AC2	1	3ØØX	Contents of AC2 (Register 4) saved here while in function IN2S.
SAV3	Save AC3	1	3Ø4X	Contents of AC3 (Register 5) saved here while in function IN2S.
CNCT	Cons Count	1	3Ø8X	Current total number of CONS's since LISP was built. May be accessed with function CONSCOUNT ().
NILB	NIL Buffer	1	3ØCX	EBCDIC representation of "NIL" left justified. (D5C9D3ØØ) used by READ routines.
NUML	Number Array Length	1	31ØX	Current length of the number array (entry NARY).
SIGC	Signal Characters	2	318X	At one time was used to store characters used to signal user (e.g. dingding). The signal function now uses an array as the value of variable (SIGC . 124) and the entry is no longer used.
DZER	Double Zero	2	32ØX	Two words of zero.
FLLN	Floating Largest Negative	2	328X	Floating point representation of largest negative 1 word integer. Used by conversion routines.
FLCV	Floating Converter	2	33ØX	Unusual floating point number used for integer to-floating-point conversion.

MNEMONIC	FULL NAME	NUMBER OF WORDS	ADDRESS	DESCRIPTION
FONE	Floating Point One	2	338X	1 in floating point. Used by I/O routines.
FHAF	Floating Point Half	2	340X	0.5 in floating point.
TENF	Floating Point Ten	2	348X	10.0 in floating point.
TNTH	Floating Point Tenth	2	350X	0.1 in floating point.
EQFL	Equal for Floating Point	2	358X	4.0×10^{-15} in floating point. Used by function *EQP to test for equality of floating point numbers. Value is approx. 2^{-48}.
TEMP	Temporary	2	360X	No particular value. Used in LAP routines for temporary storage; scratch.
TRAP	Trap	2	368X	Contains a 2 word piece of code used by function TRAPPEDP to test for trapped functions.
RTRU	Return True	2	370X	Contains a 2 word piece of code to which any LAP function may branch. Causes the function to return "T". Used by many predicates. Its use saves space in BPS.
SRST	SPAM Request Table	12	378X	Table used by I/O routines to hold data to be given to SPAM. Address of this table is put in register 1 before making SVC.

MNEMONIC	FULL NAME	NUMBER OF WORDS	ADDRESS	DESCRIPTION
REQT	Cataloger Request Table	2Ø	3A8X	Area used to generate items used for CATALOGER calls. Data is set up here, then registers are saved in SAVR and registers are reloaded from this table. Then SVC is made.
REQR	Cataloger Request Return	2Ø	3F8X	Immediately after return from a CATALOGER call, all registers are saved here. Used for debugging CATALOGER trouble.
SAVR	Save Registers	16	448X	16 words used to save general purpose registers before making SVC calls that require special register modification.
ATOM	Atom Reading	65	488X	Buffer used by I/O routines to read and write atoms (identifiers and numbers only). Limits an identifier to 256 characters.
CLAS	Class	64	59ØX	Table containing one byte for each of the 256 character identifiers. Each bit in a byte represents a particular property which the character may possess. These bits are: Ø - spacer 1 - delimiter 2 - numeric 3 - lower case

MNEMONIC	FULL NAME	NUMBER OF WORDS	ADDRESS	DESCRIPTION
				4 - non print. SYMPRINT must use $$.
				5 - printable on 33-TTY
				6 - printable on TD chain
				7 - not used
QCM	Quantum Core Map	64	69ØX	Table containing one byte for every quantum (256 words). Value in a byte determines type of data pointed to by a pointer to the associated quantum, according to the following table:
				1 - entry space
				2 - character identifier
				3 - program reference word
				4 - floating point number
				5 - array
				6 - identifier
				7 - large integer
				8 - bit word (Hex or Octal)
				9 - node
				10 - binary pgm. space
				11 - small integer
				12-255 - not used
NARY	Number Array	15Ø	79ØX	Table of up to 150 full word integers. Any one is generated by the LAP expression (NUMBER n). n is permanently stored in the next available word in NARY and the address computed. Used for

MNEMONIC	FULL NAME	NUMBER OF WORDS	ADDRESS	DESCRIPTION
				frequently used numbers in LAP to save time in unboxing the number.
OBLS	Oblist	137	9E8X	Each of the 137 entries (words) in this table contains the first pointer in a bucket. A bucket is a chained set of identifiers in identifier space such that all identifiers in a given bucket yield the same remainder when the hash code of the print name of the identifier is divided by 137. This process greatly speeds up reading multi-character identifiers.
MVBP	Move Binary Programs	100	C1ØX	Routine used by the garbage collector to move functions in BPS. Necessary since function (MVBP . 123) cannot move itself.
MFNS	Mark Functions	16	DAØX	Table of garbage collector mark functions. (ENTRY MFNS i) contains a pointer to a function that marks pointers with a QCM index of i.
UFNS	Update Functions	16	DEØX	Table of garbage collector update functions. (ENTRY UFNS i) contains a pointer to a function that updates pointers with a QCM index of i.

MNEMONIC	FULL NAME	NUMBER OF WORDS	ADDRESS	DESCRIPTION
MRKT	Mark Table	1Ø	E2ØX	Table of functions to drive mark phase of garbage collector.
PRUT	Prune Table	1Ø	E48X	Table of functions to drive prune phase of garbage collector.
FLDT	Fold Table	1Ø	E7ØX	Table of functions to drive fold phase of garbage collector.
MOVT	Move Table	1Ø	ECØX	Table of functions to drive move phase of garbage collector.
TW31	Two to the 31st Power	2	EE8X	No longer used. Now contains 10^{11} in floating point. Used in function (F2ST . 124).
UNWRAP	Unwrap	1	EECX	Used by function (UNWRAP . 122) for temporary storage.
PGNM	Program Name	2	FØØX	Contains name of LISP program as loaded. Used by function MYNAME.
STRP	Section Trap	2	FØ8X	Contains a 2 word piece of code used by function (MOVE . 119) to test for a function that has been swapped to disc by the section swapper. This function is now trapped.