

COMPILER_COMPILER

INDEX

| <u>Key to Types</u> | | <u>tag in index</u> |
|---------------------|--|---|
| M. | Miscellaneous item | 00 |
| R | Large routine | 00 |
| r | Small routine | 01 |
| P | Phrase | 10 |
| PR | Phrase routine (built-in) | 11 |
| O | Index register is left clear - type is determined by the way it is used | 00 |
| S | Special purpose (0-16 only) | - |
| A | Administrative or Interpretive Routine | 01 |
| Type Index | | |
| SP | 0 | 0101, 127 0 Compiler entry point (Item 0 has |
| SP | 1 | 150 *2 a special significance - see item 278) |
| SP | 2 | origin of record score (B88) |
| SP | 3 | head of index chain (B87) |
| SP | 4 | origin of stack (B90) (set by R161 for use by R257) |
| SP | 5 | Current set of output (=0 I.S.; =64 O.S) |
| SP | 6 | end of xed part of store |
| SP | 7 | 1102, 70,74 |
| SP | 8 | Used by instructions involving B121, B122 |
| SP | 9 | |
| SP | 10 | |
| SP | 11 | |
| SP | 12 | |
| SP | 13 | Address of start of chain store (reserved for) |
| SP | 14 | Length of chain store (used by R161. set by SET[N]BLOCKS) |
| SP | 15 | Tape address of compiler (c.f.1147 extracode) |
| SP | 15 | List program marker |
| | 17 | available to user |
| . | . | . |
| . | . | . |
| . | . | . |
| . | . | . |
| 0 | 128 | available to user |

| | | <u>Paper</u> | |
|-------------|-------------|--------------|--|
| <u>TYPE</u> | <u>Tape</u> | <u>Index</u> | |
| M | C | 129 | o Conventional list of 20 format classes including [AS], [SS] [BS], [MP] |
| P | B,C | 130 | † [MP] = PHRASE, ITEM, END OF MESSAGE, FORMAT, FORMAT CLASS, DELETE ITEM, REPLACE ITEM |
| P | C | 131 | o [BS] dictionary (M x dict) In chain |
| P | C | 132 | o [AS] dictionary (M x dict) store during |
| P | C | 133 | [SS] dictionary (M x dict) input of primary |
| M | C | 134 | o CID dictionary (no M word) material |
| R | H | 135 | * Source material analysis routine |
| M | - | 136 | Max. no. of lines allowed in [SS] |
| R | B | 137 | Dummy Routine |
| M | - | 138 | No. of faults detected by Master Routine |
| M | D | 139 | o skeleton of A* and A? A* ≡ A* = A A* <u>COMMA</u> A <u>EOS</u> A? ≡ A? = A <u>COMMA</u> NIL <u>EOS</u> |
| M | - | 140 | Max. no. of faults to be allowed by Mater Routine |
| r | D | 141 | look up or enter in a double-entry list |
| R | C | 142 | † pre-editing routine |
| P | D | 143 | o (CR),NIL |
| P | E | 144 | o [label] = [separator*?] <u>EOS</u> , [separator*?][primary label] |
| R | C | 145 | DELETE ITEM routine |
| O | G | 146 | o [primary label] = [N]),NIL |
| O | G | 147 | [instruction] = [BS] , [182][AS], [182][SS] |
| PR | E | 148 | o [separator*?] = <u>COMMA</u> , <u>EOL</u> (record contracted ant) |
| PR | D | 149 | [N] built in |
| R | B,H | 150 | * Initial entry routine |
| P | D | 151 | o [body of a phrase defn.] : [143][] = [phrase*] |
| PR | D | 152 | o [] built in = any phrase identifier AR =&I |
| O | G | 153 | [AB] or [β] |
| O | G | 154 | [ABN] or [βN] |
| R | C | 155 | † delete an item in the store |
| P | D | 156 | o [phrase*] = [phrase][phrase*] , [phrase] <u>EOS</u> |
| P | D | 157 | o [phrase] = BUT NOT , [or ES*] |
| PR | D | 158 | o [or ES*] built in (Any sequence of identifiers or basic symbols) AR = & B I I I |

| <u>Type</u> | <u>Tape</u> | <u>Index</u> |
|-------------|-------------|---|
| P | D | 159 o [serial number] = <u>COMMA</u> [N], <u>COMMA</u> [or ES*], NIL |
| PR | D | 160 * [N] (as 149 but not in CID), used by 146 |
| R | B,C | 161 * Set Chain & Stack (subroutine of 150) |
| O | - | 162 User's Entry |
| P | D | 163 o [body of format defn.] = [pi] = [pi or ES*][serial number]_EOS_ |
| R | C | 164 o REPLACE Item Routine |
| M | - | 165 Temporary index register used by 164, 237 |
| PR | D | 166 [a] and [A] built-in : effectively 1, 2,,,,, 4194303 or A1,A2,,,,, |
| PR | D | 167 [b] and [B] built-in : effectively β 1, β 2,,,,, β 4194303 or B1,B2,,,,, |
| P | - | 168 spare |
| M | C | 169 o list of dictionaries and lists to be packed |
| A | F | 170 * interpret -> B82 |
| P | D | 171 o [general phrase identifier] = [[phrase identifier][phrase label] [phrase index]] |
| PR | D | 172 o [phrase identifier] built-in AR = X BnIIII or X N |
| PR | E | 173 [OW] |
| P | D | 174 [Phrase label] = / [N], NIL |
| R | C | 175 Second entry to 'delete item' (155) routine or list of routines to be deleted by END OF PRIMARY MATERIAL |
| P | D | 176 o [phrase index] = ([ABN]), NIL |
| r | D | 177 o print new format or phrase |
| O | G | 178 [0-3] |
| P | E | 179 [SEP] = <u>COMMA</u> , <u>EOL</u> |
| O | G | 180 † diagnostic subroutine of Master Routine |
| PR | E | 181 o [PI] denotes identifier / label?/index? |
| O | G | 182 o (CR)[182] = *, NIL |
| r | D | 183 Print label |
| PR | E | 184 o [LABEL] |
| P | E | 185 o [RESOLVED-P] = [set p] [reset p] <u>1</u> , [reset p] <u>-1</u> |
| O | G | 186 o [GENERATED-P] [186] = [152] |

| Type | Tape | Index | |
|------|------|-------|--|
| A | F | 187 | ≠ [AB] = [WORD] |
| A | F | 188 | ≠ [AB] = [WORD][OPERATOR][WORD] |
| A | F | 189 | ≠ ([ADDR]) = [WORD] |
| A | F | 190 | ≠ ([ADDR]) = [WORD][OPERATOR][WORD] |
| A | F | 191 | [JUMP][LABEL][IU][WORD][COMPARATOR][WORD] |
| A | F | 192 | [JUMP][LABEL] |
| A | F | 193 | LET [PI] = [GENERATED-P] |
| A | F | 194 | [JUMP][LABEL][IU][PI][EQV][RESOLVED-P] |
| A | F | 195 | LET [PI][EQV][RESOLVED-P] |
| A | F | 196 | [JUMP][LABEL][IU][PI] = [PI] |
| A | F | 197 | [AB] = CATEGORY OF [PI] |
| A | F | 198 | [AB] = NUMBER OF [PI] |
| A | F | 199 | [FD][COMMA][WORD][COMMA][WORD][COMMA][WORD] |
| A | F | 200 | PLANT [FD][COMMA][WORD][COMMA][WORD][COMMA][WORD]IN [AB] |
| A | F | 201 | [PI] = [AB] |
| A | F | 202 | [AB] = ADDRESS OF [PI] |
| A | F | 203 | [AB] = CLASS OF [PI] |
| r | D | 204 | add word to list |
| r | D | 205 | add word to nest |
| r | D | 206 | withdraw word from nest |
| r | D | 207 | delete chain |
| A | F | 208 | CALL R [ABN] |
| r | D | 209 | add list to list |
| r | D | 210 | o copy linear list to chain |
| A | F | 211 | CALL R [PI] |
| A | F | 212 | [FD][COMMA][WORD]0[COMMA]L[LABEL] |
| R | D | 213 | o Read next section |
| R | B,C | 214 | ¥ Master routine |
| R | B,C | 215 | Analysis routine |
| M | C | 216 | 24-bit multiplication and division routine |
| r | E | 217 | o Convert absolute &'s to relative &'s |

| <u>Type</u> | <u>Tape</u> | <u>Index</u> |
|-------------|-------------|---|
| R | D | 218 o PHRASE routine |
| r | C | 219 print B82 in Octal |
| R | D | 220 o FORMAT routine |
| R | E | 221 o ROUTINE routine |
| R | B | 222 o Dual routine |
| r | E | 223 o 'Is it parameter-free?' routine |
| R | D | 224 General Dict. Routine |
| R | D | 225 o Merge new entry into dictionary (first or last) |
| O | H | 226 † END OF PRIMARY MATERIAL routine |
| R | C,C | 227 END OF MESSAGE routine |
| r | C | 228 o Transfer dict. to record store |
| P | D | 229 o COMMA |
| R | D | 230 o [identifier] conversion routine |
| r | C | 231 o transfer dict. to chain store |
| A | F,H | 232 * Transplant routine (B74) |
| A | F | 233 look-up |
| r | F | 234 look-up ([PI]) L.S.E. routine |
| A | F | 235 Compute value of a word |
| A | F | 236 Compute value of an address |
| O | H | 237 Body of end of primary material routine |
| R | B,C | 238 ¥ Line reconstruction routine |
| M | B,H | 239 * DOWN sequence(B76) |
| M | B | 240 * END sequence |
| R | | 241 List B61 = entry with value B63 in dict. B62 |
| R | D | 242 o Auxiliary Phrase routine |
| R | C | 243 General Packing Routine for dicts. etc. |
| PR | E | 244 o Set p' |
| R | C | 245 General unpacking routine |
| M | B,C | 246 +++ Standard flexwriter tab-settings |
| M | B | 247 +++ Line image for R238 |

| <u>Type</u> | <u>Tape</u> | <u>Index</u> | |
|-------------|-------------|--------------|---|
| r | c | 248 | Decimal printing routine |
| C | G | 249 | o [compile phrase] = (COMPILER), NIL |
| PR | E | 250 | o reset p |
| PR | E | 251 | [FD] |
| r | B | 252 | * Split chain into 2 sub-chains |
| R | E | 253 | o Compile body of a routine |
| O | G | 254 | o [routine heading] = SMALL R [N], R [N],[compile phrase] [PI][EQV][GENERATED-P] |
| PR | | 255 | Spare for phrase routine |
| M | C | 256 | o Double entry list for serial no of routine / serial no of corresponding compiled version |
| R | C,H | 257 | * Catastrophic Fault Routine |
| R | C,H | 258 | * Non-catastrophic fault routine |
| r | D | 259 | o add nil branch to dictionary |
| R | D | 260 | o Entry to phrase routine used by auxiliary phrase routine |
| R | B,C | 261 | ¥‡ Convert metasyntactical symbols |
| A | F | 262 | END (i.e. the [BI] format) |
| A | F | 263 | [AB] = INDEX [ABN] |
| A | F | 264 | INDEX [ABN] = [AB] |
| r | D | 265 | o delete superfluous <u>EOL</u> 's |
| R | B | 266 | o Item routine |
| A | F | 267 | SHIFT [AB] UP [ABN] |
| A | F | 268 | SHIFT [AB] DOWN [ABN] |
| A | F | 269 | SPACE |
| A | F | 270 | NEWLINE |
| A | F | 271 | PRINT [ABN] |
| O | G | 272 | o FORMAT CLASS routine |
| A | F | 273 | PRINT SYMBOL [ABN] |
| O | H | 274 | * Sequence used by monitor |
| O | H | 275 | DEFINE COMPILER |
| O | - | 276 | +--+ Body of Define Compiler, Define Master Compiler, Define Special Compiler |
| A | F | 277 | PRINT [ABN] IN OCTAL |
| R | E | 278 | o FIXED ITEM routine |
| O | H | 279 | * Fixed 'DOWN' sequence (B76) |
| O | H | 280 | * Fixed 'TRANSPLANT' sequence (B74) |

| <u>Type</u> | <u>Tape</u> | <u>Index</u> | |
|-------------|-------------|--------------|---|
| O | H | 281 * | SLIDE COMPILER UP A BLOCK (FIXED ITEM) |
| M | | 282 * | Compiler title record (set in DEFINE COMPILER: printed in R150) |
| | | 283 | PRINT B-LINES (as preserved on stack) |
| | | 284 | |
| | | 285 | |
| | | 286 | |
| | | 287 | |
| | | 288 | |
| | | 289 | |
| | | 290 | |
| | | 291 | |
| O | G | 292 | BUILT-IN PHRASE routine |
| | | 293 | |
| | | 294 | |
| | | 295 | |
| R | | 296 * | Error routine[call for a deleted routine] |
| r | | 297 +++ | Print character (subroutine of R238) |
| O | | 298 * | TRACE for END (Fixed itemO |
| O | | 299 | TRACE for DOWN |

| <u>Type</u> | <u>Index</u> |
|-------------|---|
| P | 300 o [EQV] |
| P | 301 [JUMP] |
| P | 302 o [OPERATOR] |
| P | 303 o [COMPARATOR] |
| P | 304 [ADDR] |
| P | 305 [WORD] |
| P | 306 [-?] |
| P | 307 [-] |
| P | 308 o [IU] |
| P | 309 o [,WORD] |
| P | 310 o [LIST OR NEST] |
| O | 311 [WORD]/[WORD] (only compiling version exists) |
| R | 312 [AB]=[LIST OR NEST][WORD] |
| P | 313 o [,WORD*] |
| R | 314 [AB]=[LIST OR NEST][WORD] |
| R | 315 [AB]=LIST[PI] |
| R | 316 [AB]=LIST[AB]([ABN*?]) |
| R | 317 [AB]=VALUE OF LIST[AB]IN DICT[AB] |
| R | 318 [AB]=CONVENTIONAL LIST OF [ABN] WORDS |
| R | 319 DELETE CONVENTIONAL LIST [AB] |
| R | 320 DELETE [LIST OR NEST][AB] |
| R | 321 DELETE LIST[AB]FROM DICT[AB] |
| R | 322 ADD([WORD][,WORD*])TO[LIST OR NEST][AB] |
| R | 323 ADD[WORD]TO[LIST OR NEST][AB] |
| R | 324 ADD LIST [AB],[WORD] TO DICT[AB] |
| R | 325 ASSIGN VALUE[ABN]TO[PI] |
| R | 326 ANALYSE LIST[AB] W.R.T.[PI] |
| R | 327 WITHDRAW[AB]FROM NEST[AB] |
| R | 328 LIST[AB]LIST[AB]+LIST[AB] |
| | 329 LIST[AB]=ENTRY WITH VALUE[AB]IN DICT[AB] |
| | 330 LIST[AB]=NEXT LINE FROM INPUT[N] |
| R | 331 LIST[AB]=NEXT RECONSTRUCTED LINE |

| <u>Type</u> | <u>Index</u> | |
|-------------|--------------|---|
| R | 332 | CONVERT[PI]TO[AB] |
| R | 333 | CALL[PI]COMPILER[GENERATED-P] |
| R | 334 | [ALL SYMBOLS EXCEPT RT BRACKET] |
| R | 335 | MONITOR ([ALL SYMBOLS EXCEPT RT BRACKET]) |
| R | 336 | PRINT LIST[ABN] |
| CV | 337 | |
| CV | 338 | |
| CV | 339 | |
| R | 340 | DEFINE MASTER COMPILER |
| CV | 341 | |
| CV | 342 | |
| CV | 343 | |
| CV | 344 | |
| CV | 345 | |
| CV | 346 | |
| CV | 347 | |
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| CV | 363 | |

| <u>Type</u> | <u>Index</u> | |
|-------------|--------------|---|
| CV | 364 | |
| R | 365 | o POPI[WORD]TO[WORD] |
| P | 366 | o [NOTE'] |
| P | 367 | o [NOTE] |
| P | 368 | o [TABLE LABEL] |
| R | 369 | [TABLE] |
| R | 370 | PLANT[AB]TH ORDER OF TABLE[TABLE]IN[B] |
| R | 371 | PLANT TABLE[TABLE]IN[B] |
| R | 372 | [NOTE] (only compiling version exists) |
| CV | 373 | |
| P | 374 | [TABLE ENTRY] |
| P | 375 | [REST OF TABLE] |
| CV | 376 | |
| CV | 377 | |
| CV | 378 | |
| CV | 379 | |
| CV | 380 | |
| CV | 381 | |
| CV | 382 | |
| CV | 383 | |
| CV | 384 | |
| CV | 385 | |
| R | 386 | [AB]=UPPER LIMIT OF[AB]IN DICT[AB] |
| R | 387 | [AB]=LIST FOR [AB]IN CLASS[ABN] |
| CV | 388 | |
| R | 389 | PRINT B-LINES (only compiling version exists) |
| CV | 390 | |
| R | 391 | CALL BUILT-IN PHRASE[PI] (only C.V.exists) |
| R | 392 | PRESERVE ANALYSIS B-LINES (only C.V.exists) |
| R | 393 | RESTORE ANALYSIS B-LINES (only C.V.exists) |
| CV | 394 | |
| CV | 395 | |

| <u>Type</u> | <u>Index</u> | |
|-------------|--------------|-------------------------|
| CV | 396 | |
| CV | 397 | |
| R | 398 † | DEFINE SPECIAL COMPILER |
| R | 399 | LIST PROGRAM |
| R | 400 | DO NOT LIST PROGRAM |
| R | 401 | NOTES: |
| P | 402 | [LNOTE'] |
| PR | 403 | [LNOTE] |
| R | 404 | SET[N]BLOCKS |
| R | 405 | FRIG |
| CV | 406 | |
| P | 407 | FORMAT CLASS [DEBUG] |
| P | 408 | [DEBUG OPTS] |
| R | 409 | FORMAT [AS]=[DEBUG] |
| R | 410 | PRINT ITEM[WORD] |
| R | 411 | RPRINT[WORD] |
| R | 412 | [AB]=END OF ITEM[WORD] |
| R | 413 | SWITCH TRACE ON |
| R | 414 | SWITCH TRACE OFF |
| R | 415 | POPO[WORD]TO[WORD] |
| CV | 416 | |
| | 417 | |
| | 418 | |
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| | 420 | |
| | 421 | |
| | 422 | |
| | 423 | |
| | 424 | |
| | 425 | |
| | 426 | |

Note that the Type CV indicates a Compiling Version. Such routines are given a new serial number each time they are redefined and the old number is returned to the list of available indexes. The correspondence between a CV and its associated Format number is given by Item 256.

FOOTNOTE KEY

| | |
|------|---|
| * | Must not be deleted |
| † | Can be deleted only by calling R155 from R276 |
| ‡ | Can be deleted only by rewriting the master routine R214 |
| ± | These four routine are really the same routine. One may not be deleted unless all 4 are deleted and then only by deleting one of them and then clearing the indices of the other 3. |
| ¥ | Can be rewritten to provide shorter versions in a finalised compiler |
| +--+ | It is possible to write a self deleting version of R276 |
| +++ | Can be deleted by rewriting R238 |
| o | Deleted by the standard END OF PRIMARY MATERIAL |
| | Receives special attention in END OF PRIMARY MATERIAL |