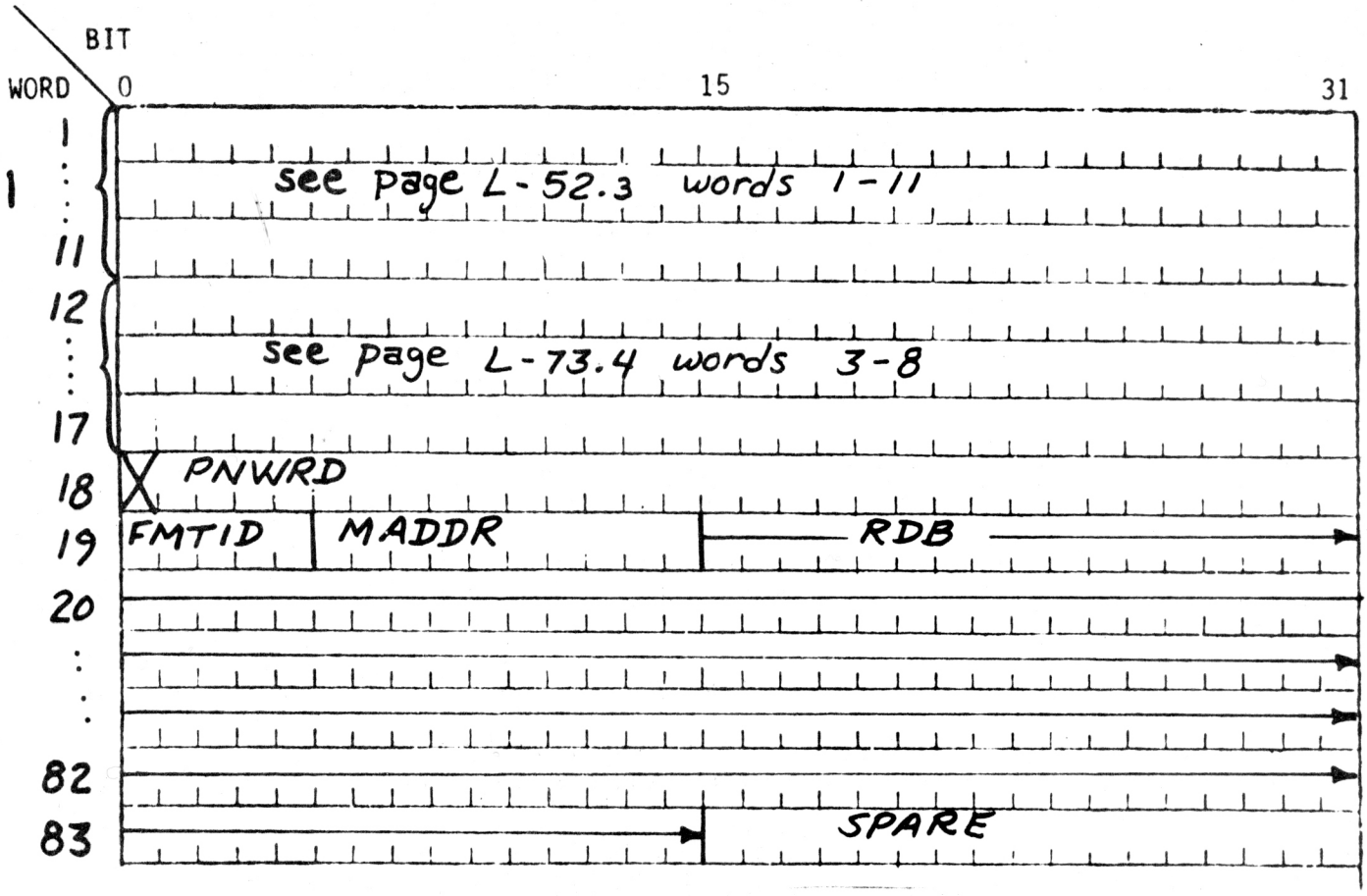
7.2 Header

70

| WORD \ BIT | 0 | 15 | 31 |
|---|---|---|---|
| 1 | LOGICAL RECORD FLAG | LENGTH OF LOGICAL RECORD | |
| 2 | TTAG | | |
| 3 | SPC | TCF | DAYEAR |
| 4 | SPARE | CAT. FLAG | SCC \| DQUAL |
| 5 | BERR | YEAR | SNR |
| 6 | DSS | LOCK | CONFIG |
| 7 | SPECIAL DATA TYPE | GDD | NDBR |
| 8 | AGCSMP | HSDERR | DATRAT |
| 9 | AVAGC | | |
| 10 | SPARE | | SDRREC |
| 11 | SEQ | | VMCIND |
| 12 | WORD 3 (Format dependent, see Page L-52.4) | | |
| 13 | WORD 4 (Format dependent, see Page L-52.5) | | |
| 14 | SPARE | | |

7.3 Seismometry Data 113




Any incomplete frames (ie. less than 83 words) will be zero filled. Lower priority seismometer data will be in the following order: 116 117

1. Inter-record gap data (old data). 119

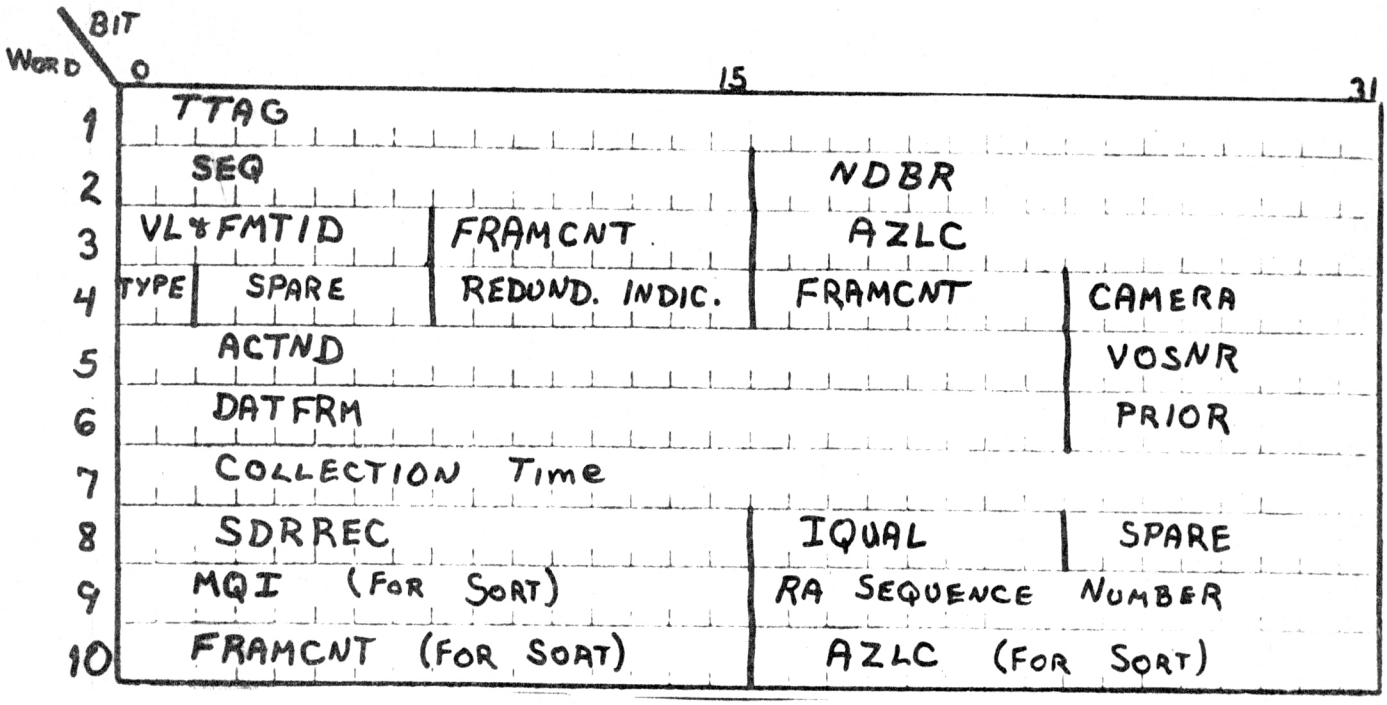
2. Redundand data (same as first priority except the data has a lower quality). 121 122

Note 1: All Binary integers are right-hand justified unless otherwise stated.

NOTE 2: Bit 0 of word 18 is never used. Data will start in bit 1 of word 18.

SEE L-00 FOR MNEUMONIC DESCRIPTIONS.

FILE LAYOUT FOR IMAGERY 100

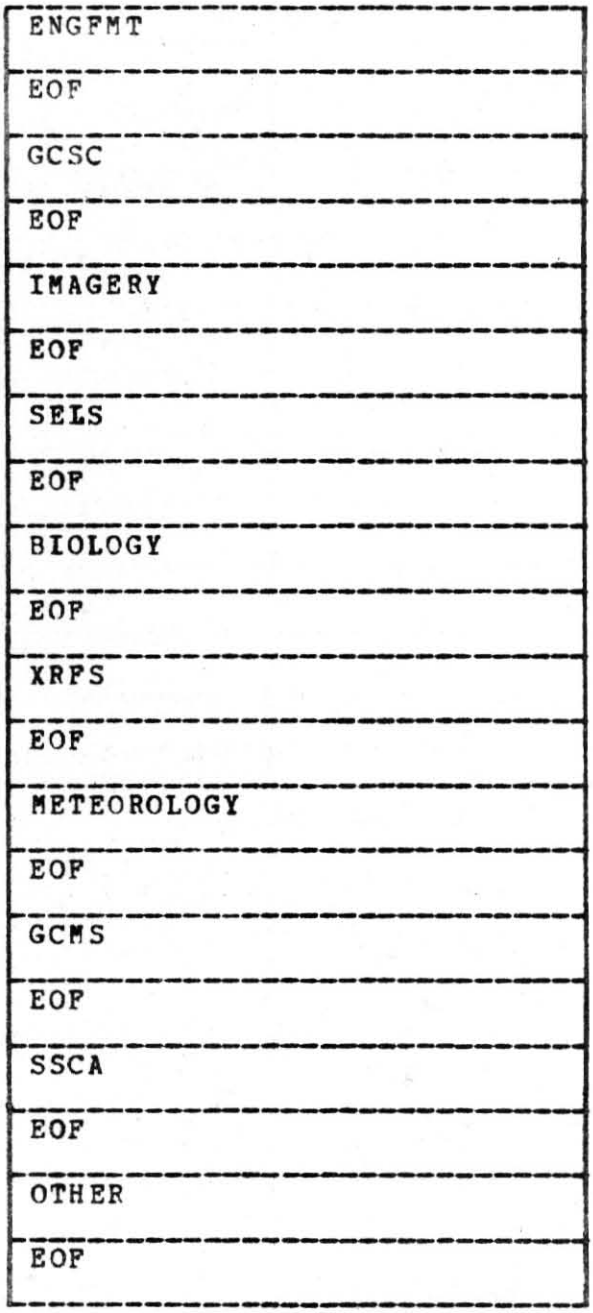



TYPE 102
01 - Precalibration data 103
10 - PIXEL data 104
11 - Post calibration data 105

REDUND. INDIC. 107
00 - Prime data 108
01 - Redundant data 109
MQI - Modified Quality Indicator 110

FILES OTHER THAN IMAGE PLEASE SEE PREVIOUS PAGE. 113
SEE L-00 for nneumonic definitions. 114

4. ORGANIZATION




Ten files are ordered as above. Each of the files contain 10 word data groups (a logical record) defined in section (7). A file consists of 1-N blocks, where a physical record represents 100 logical records. Hence, each physical record is 1000 words. After the last good logical record in a block, the remainder of the block is 1 filled. If the last good physical record is the last 10 words in a block, an entire block will be 1 filled before the EOF.

5. STORAGE MEDIUM AND RETENTION

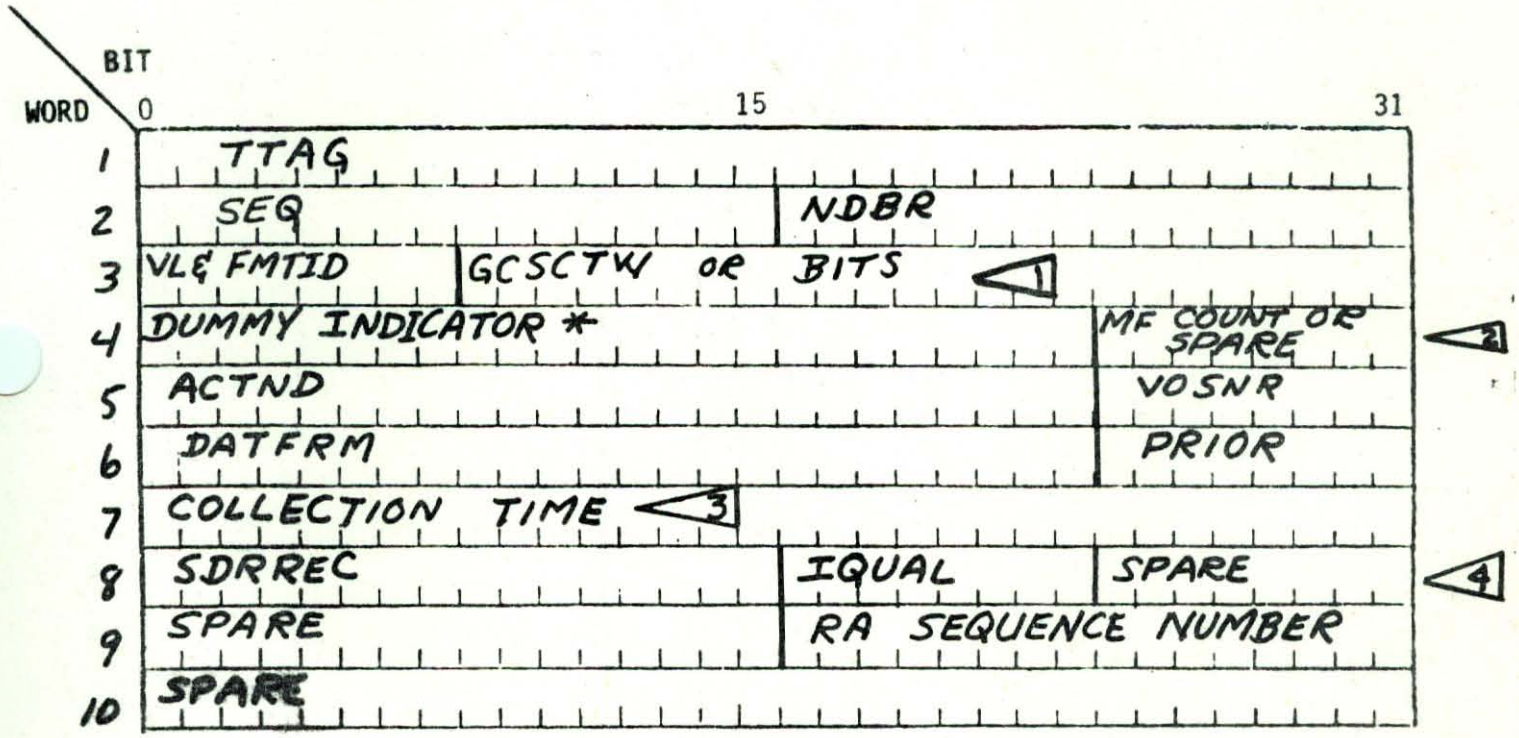
storage - disk
retention - only while DECSET running

6. USAGE BY PROGRAM AND SUBFUNCTION

DECSET (LSORT) - output
DECSET (MAINLINE) - input

7. DETAILED DESCRIPTION OF FILE LAYOUT

File layout for all files shown in 4. except IMAGERY.




*All 1's if dummy frame, otherwise SPARE.
See L-00 for mneumonic definitions.

| | | | |
|---|---|---|---|
| 1 | FOR PMT 2A: | If MF1, Bits = GCSC Time Counts | 116 |
| | | If MF2, Bits = Measurements G4517 & G4522 | 117 |
| | FOR PMT 3: | If MF1 or MF3, Bits = GCSC Time Counts | 119 |
| | | If MF2 or MF4, Bits = Measurements G4519, | 120 |
| | | & G4513, G4515 | 121 |
| | FOR PMT 5: | If > 30 K, Bits = GCSC Time Counts | 123 |
| | | If < 30 K, Bits = Segment Count | 124 |
| | FOR SEIS: | GCSC Time Count is only 23 Bits (RT. | 126 |
| | | Justified) | 127 |
| | FOR GCMS: | Bits 8-23 = Scan Frame Count | 129 |
| | | Bits 24-31 = Data Block Count | 130 |
| | FOR BIO: | Bits 8-15 = Frame Number 47 | 132 |
| | | Bits 16-31 = Frame Length 48 | 133 |
| | FOR SSCA: | Bits 8-15 = Spare | 135 |
| | | Bits 16-31 = Command Word 49 | 136 |
| | FOR OTHER: | Bits 8-31 = Bits 37 to 60 from the | 138 |
| | | unidentified | 139 |
| 2 | FOR GCSC MEMORY DUMP: | This will contain frame number 31 | 141 |
| | FOR GCMS: | Bits 0-31 = GCSC collection time from PMT 4 | 143 |
| | | that FOLLOWS | 144 |
| | FOR PMT 5: | Bit 24 = Flag set to zero if 4 for 1 coding | 146 |
| | | removed; set to one if not. | 147 |
| | | Bits 25-30 = SPARE | 148 |
| | | Bit 31 = Flag Set to zero if time word in | 149 |
| | | bits 41-64; set to one if segment count in | 150 |
| | | bits 41-64. | 151 |
| | FOR SEIS: | Bits 0-31 = Spare | 153 |
| | FOR OTHER: | Bits 24-31 = Contain bits 61 to 68 from uni- | 155 |
| | | dentified data frame | 156 |
| 3 | FOR GCMS: | Bits 0-31 = GCSC collection time from PMT4 | 158 |
| | | that PRECEEDED | 159 |
| 4 | FOR GCMS: | Bits 30-31 = Bit 37 and 38 from telemetry | 161 |
| | | frame (PMT & MODE ID) | 162 |

3.1.1.5.3 Data Signal- . One bit of NRZ-L digital data will be shifted out of the unit for each cycle of the shift pulse signal as long as the data ready line is on. The unit shall remove the data ready signal when the last bit is shifted out of the unit.

3.1.1.5.4 Data Format- Data shall be sampled, formatted and stored in a manner that will allow time correlation, during data reduction, of each data sample to within ± 1 millisecond, not counting the error possible due to the GCSC. Data shall be gathered and read into the buffer memories according to the folliwng formats.

(AC) 3.1.1.5.4.1 Prefix- A "prefix" shall be inserted at the start of each new buffer and shall occupy bits 1 through 53 of the 2048 bit buffer. The "prefix" will contain Mission Time information (23 bits), Command Status information (22 bits) and Change Code Flag information (8 bits). The format is illustrated in Figure 18.

(AC) 3.1.1.5.4.1.1 Mission Time- The mission time shall be stored in the buffer in the same bit order as received from the GCSC (i.e., 2nd bit from the GCSC goes into bit #1 of the buffer, 24th bit from the GCSC goes into bit #23 of the buffer).

(AC) 3.1.1.5.4.1.2 Command Status- The command status shall be stored in the buffer in the same bit order as received from the GCSC. The GCSC provides a 24 bit command word, the first two bits of which are ignored. Only the remaining 22 bits carry the command information as defined in Table II. Bit #1 of the seismometer command word (Bit #1 as defined in Table II) shall be inserted in bit #24 of the buffer and bit #22 of the command word in bit #45 of the buffer. The "command" inserted into the prefix shall be the contents of the command memory register at the time of the "prefix".

(AC) 3.1.1.5.4.1.3 Change Code Flag- The change code flag shall be used to indicate an irregularity in the data formatting. During normal operation this flag word will be all zeros. Under the condition when a change sequence was initiated at a time in filling the previous buffer when 91 bits or less of the buffer remained unfilled then no change sequence is inserted into either buffer, the remaining bits in the previous buffer shall be all "zeros" or all "ones" and the change code flag word shall be all "ones". This word shall be inserted into bits #46 through #53 of the buffer. All "ones" are inserted in the change code flag word when the seismometer is just commanded into an operating mode after the application of power.

(AM) 3.1.1.5.4.2 Operating Mode Data- The operating mode data shall be inserted into the buffer following the prefix and successive samplings will be entered into the buffer until the buffer is filled or a mode change occurs. After the prefix or the mode change code the operating mode data always starts with an X channel sample except for the first prefix after power turn-on if the command is not for high data rate mode. In this case, the first sample may be a Y channel sample.

(AM) 3.1.1.5.4.2.1 Normal Mode- The outputs from each of the three channels shall be sampled and digitized sequentially; X channel first, then Y, then Z and then repeated as specified in paragraph 3.1.1.3.1.2. The digital data shall be stored in the buffer in the same order of channel sampling with the least significant bit (LSB) of each 8 bit word read in first. The normal mode format is illustrated in figure 19. (Note: in the normal mode the first seven bits provide the amplitude data; the eighth bit (in the MSB position) carries no information).

3.1.1.5.4.2.2 Event Mode- The outputs from each of the three channels shall be sampled sequentially; X channel first, then Y, then Z and then repeated as specified in paragraph 3.1.1.3.2.2. The output from each channel shall consist of two words; an eight bit word representative of amplitude, read into the buffer least significant bit first, followed by a 5 bit word representative of the number of axis crossings (see paragraph 3.1.1.3.2.1), read into the buffer least significant bit first. The event mode format is illustrated in figure 20. (Note: In the event mode the first seven bits provide the amplitude data; the eighth bit (in the MSB position) carries no information and is always "zero").

3.1.1.5.4.2.3 High Data Rate Mode- The outputs from each of the three channels shall be sampled sequentially; X channel first, then Y, then Z and then repeated as specified in paragraph 3.1.1.3.3.2. The output from each channel shall be an eight bit word representative of amplitude, read into the buffer least significant bit first. The high data rate format is illustrated in Figure 21. (Note: In the high data rate mode the first seven bits provide the amplitude data and the eighth bit (MSB position) indicates the sign of the displacement - "zero" indicates a positive displacement and a "one" indicates a negative displacement. Digital data for a negative signal is represented by the "two's complement" of digital data for a positive signal of equal amplitude).

3.1.1.5.4.3 Change Code Sequence- When an operating change occurs, either by command from the GCSC or as an internally generated mode change, the unit shall stop processing data in its previous mode, insert a Change Code Sequence into the buffer and start processing data in the new mode. The Change Code Sequence will contain Change Code information (15 bits), Source Identifier (5 bits), Mission Time information (24 bits) and Command Status information (22 bits). The format is illustrated in figure 22.

3.1.1.5.4.3.1 Change Code- The change code shall be 000011101100101. The first bit shifted into the buffer shall be "zero" and the last bit "one" (i.e., shifted into the buffer in the order of reading the code from the left to the right).

3.1.1.5.4.3.2 Source Identifier- The source identifier shall be 01000. The order of reading into the buffer shall be the same as for the change code.

3.1.1.5.4.3.3 Mission Time- As in paragraph 3.1.1.5.4.1.1 with the exception that all 24 bits of the GCSC mission time word are used.

3.1.1.5.4.3.4 Command Status- As in paragraph 3.1.1.5.4.1.2. (Note: When a mode change is generated internally the command status is not updated and the command word in the change code sequence is the last command received from the GCSC).

3.1.1.5.4.4 Buffer Dump- When the unit is serviced by the GCSC/DAPU it shall transfer a 46 bit initial sequence to the DAPU followed by the contents of the buffer.

(AL) 3.1.1.5.4.4.1 Initial Sequence- The initial sequence shall consist of a 31 bit Frame Synchronization word, a 5 bit Source Identifier code and a 10 bit Memory Address word. The format is illustrated in figure 23.

The Frame Synchronization and Source Identifier words are defined in figure 23.

The 10 bit Memory Address word, which is transferred to the DAPU LSB first, shall identify the buffer bit number in the read-out position at the time of receipt of the 37th data shift pulse from the DAPU. The LSB shall identify which memory is being serviced (Memory "A" = 1, Memory "B" = 0) and the remaining 9 bits shall identify the bit number "Q" as shown in Table V.

(AL)

3.1.1.5.4.4.2 Sequence of Read-Out From the Buffer- If the Memory Address indicates that buffer bit number Q is in the read-out position at the time of receipt of the 37th data shift pulse from the DAPU then the order of read-out of bits from the buffer to the DAPU for Q less than 503 shall be:

Buffer Bit # (Q+10) to bit # (512), followed by:
Buffer Bit # (1) to bit # (Q+9), followed by:
Buffer Bit # (Q+522) to bit # (1024), followed by:
Buffer Bit # (513) to bit # (Q+521), followed by:
Buffer Bit # (Q+1034) to bit # (1536), followed by:
Buffer Bit # (1025) to bit # (Q+1033), followed by:
Buffer Bit # (Q+1546) to bit # (2048), followed by:
Buffer Bit # (1537) to bit # (Q+1545).

For Q>503, the order of read-out of bits from the buffer to the DAPU shall be:

Buffer Bit # (Q-502) to bit # (512), followed by:
Buffer Bit # (1) to bit # (Q-503), followed by:
Buffer Bit # (Q+10) to bit # (1024), followed by:
Buffer Bit # (513) to bit # (Q+9), followed by:
Buffer Bit # (Q+522) to bit # (1536), followed by:
Buffer Bit # (1025) to bit # (Q+521), followed by:
Buffer Bit # (Q+1034) to bit # (2048), followed by:
Buffer Bit # (1537) to bit # (Q+1033).

For Q=503, the order of read-out shall be:

Buffer Bit # (1) to bit # (2048).

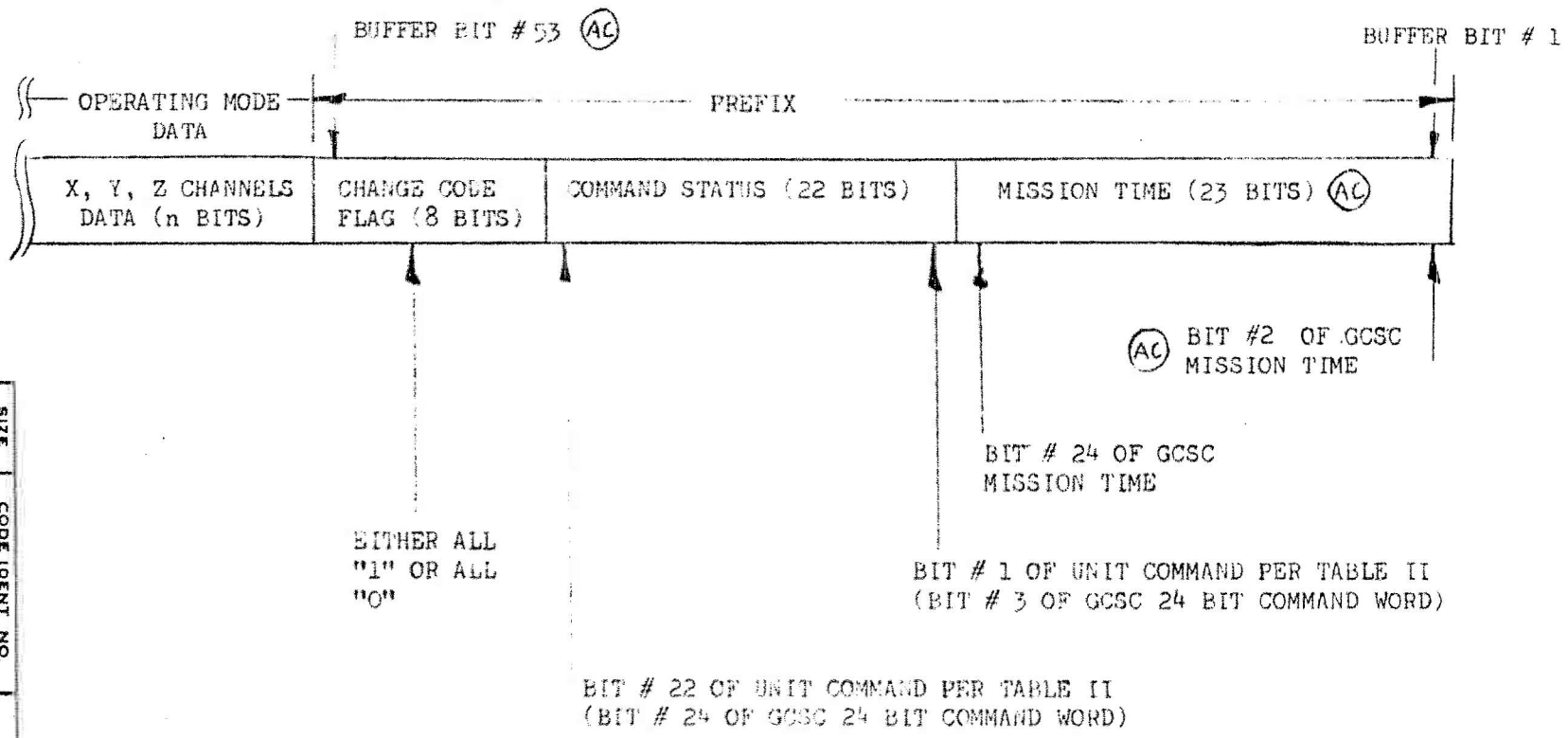
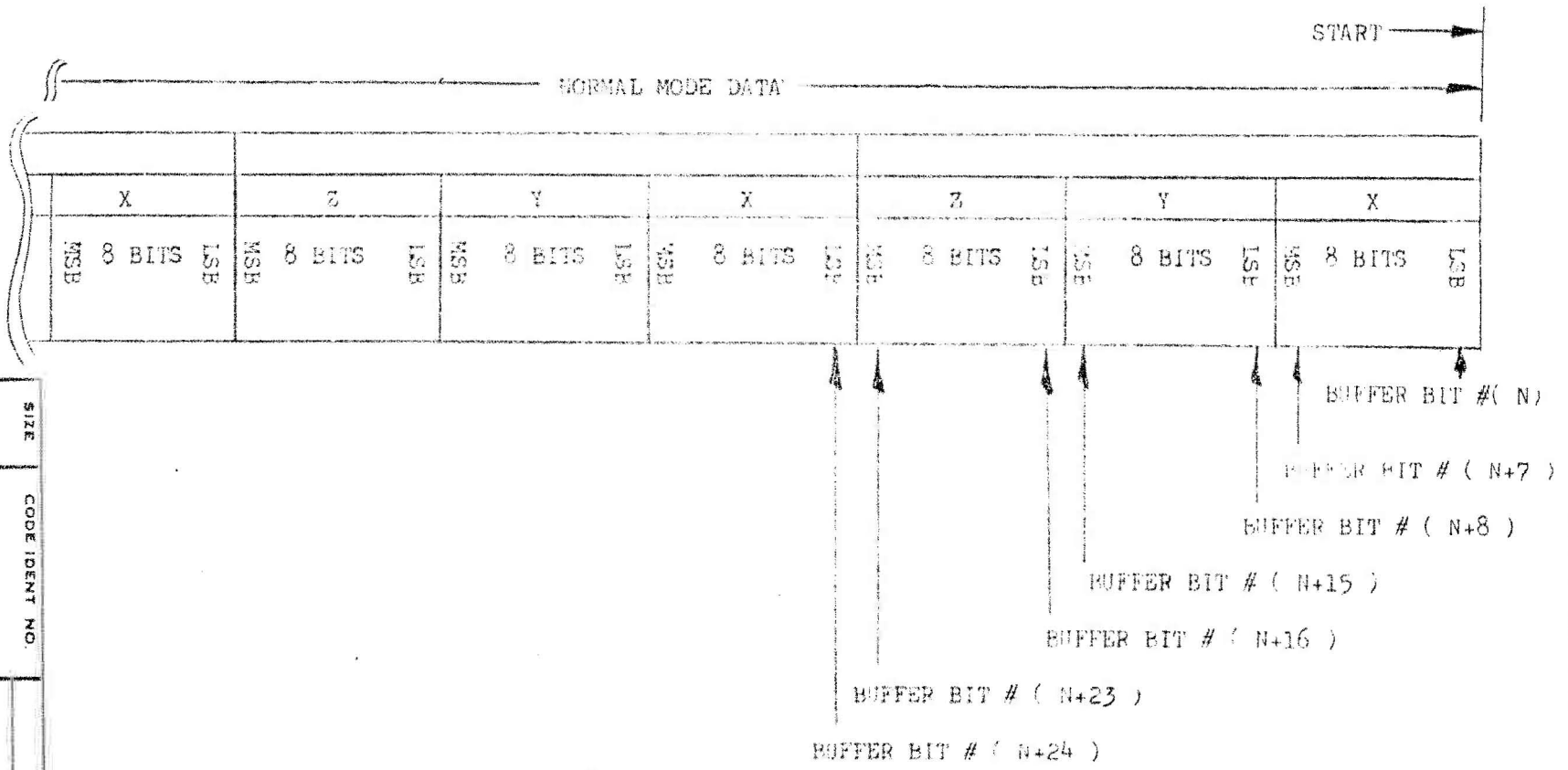



FIGURE 18 - PREFIX FORMAT




LSB = LEAST SIGNIFICANT BIT

MSB = MOST SIGNIFICANT BIT

FIGURE 19 - NORMAL MODE DATA FORMAT

CHG AC

SIZE A

CODE IDENT NO. 04236

SCALE

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PD7400072

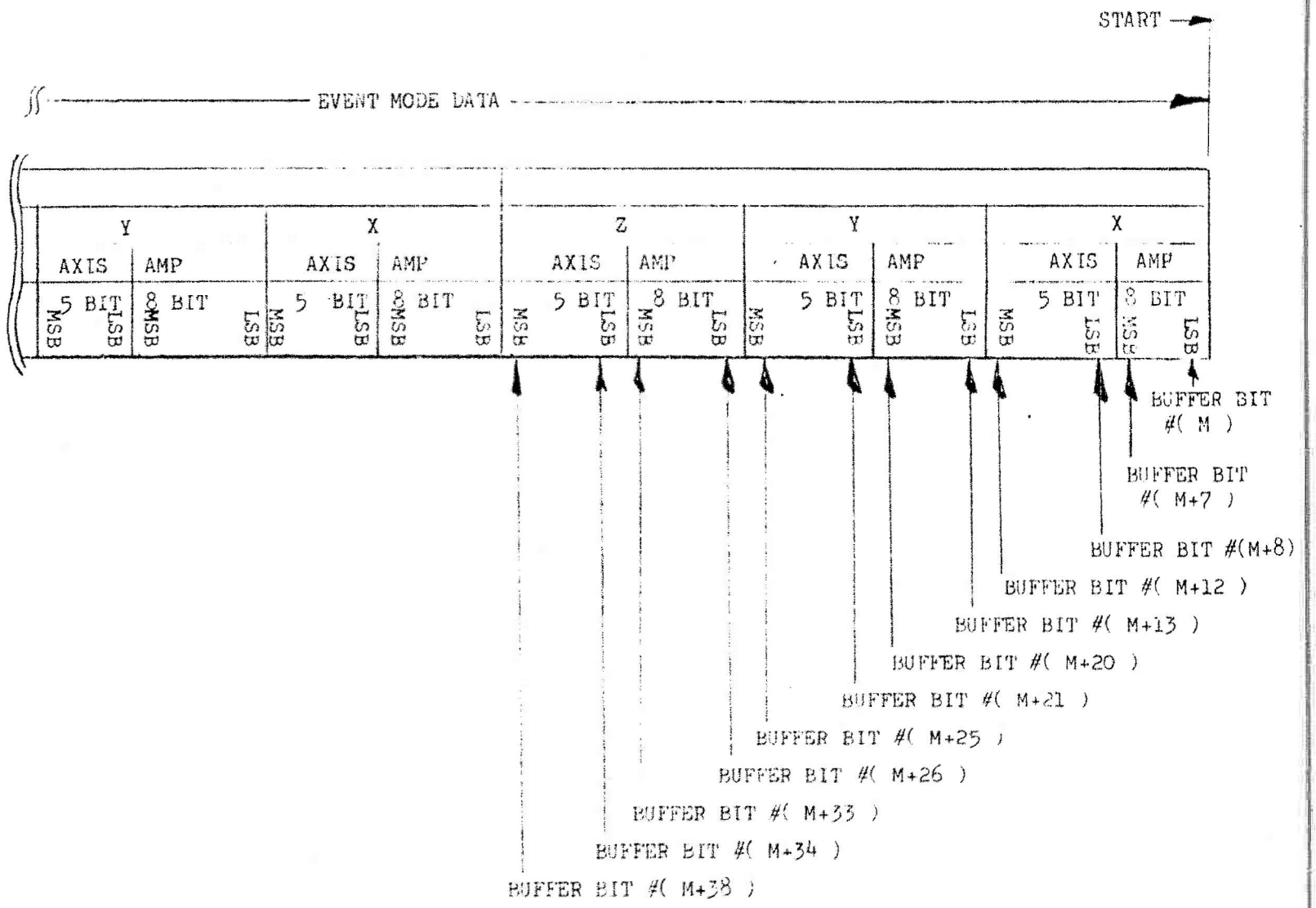


FIGURE 20 - EVENT MODE DATA FORMAT

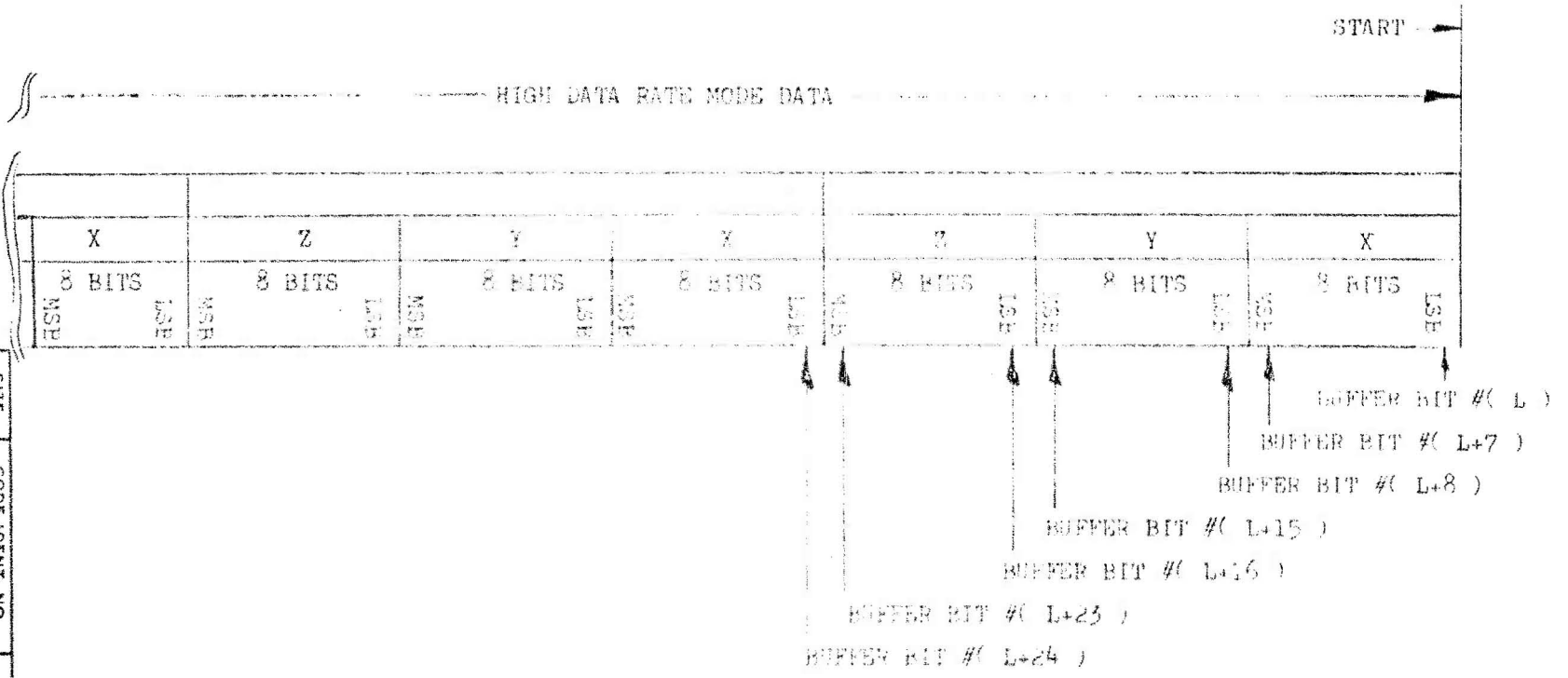


FIGURE 21 - HIGH DATA RATE MODE FORMAT

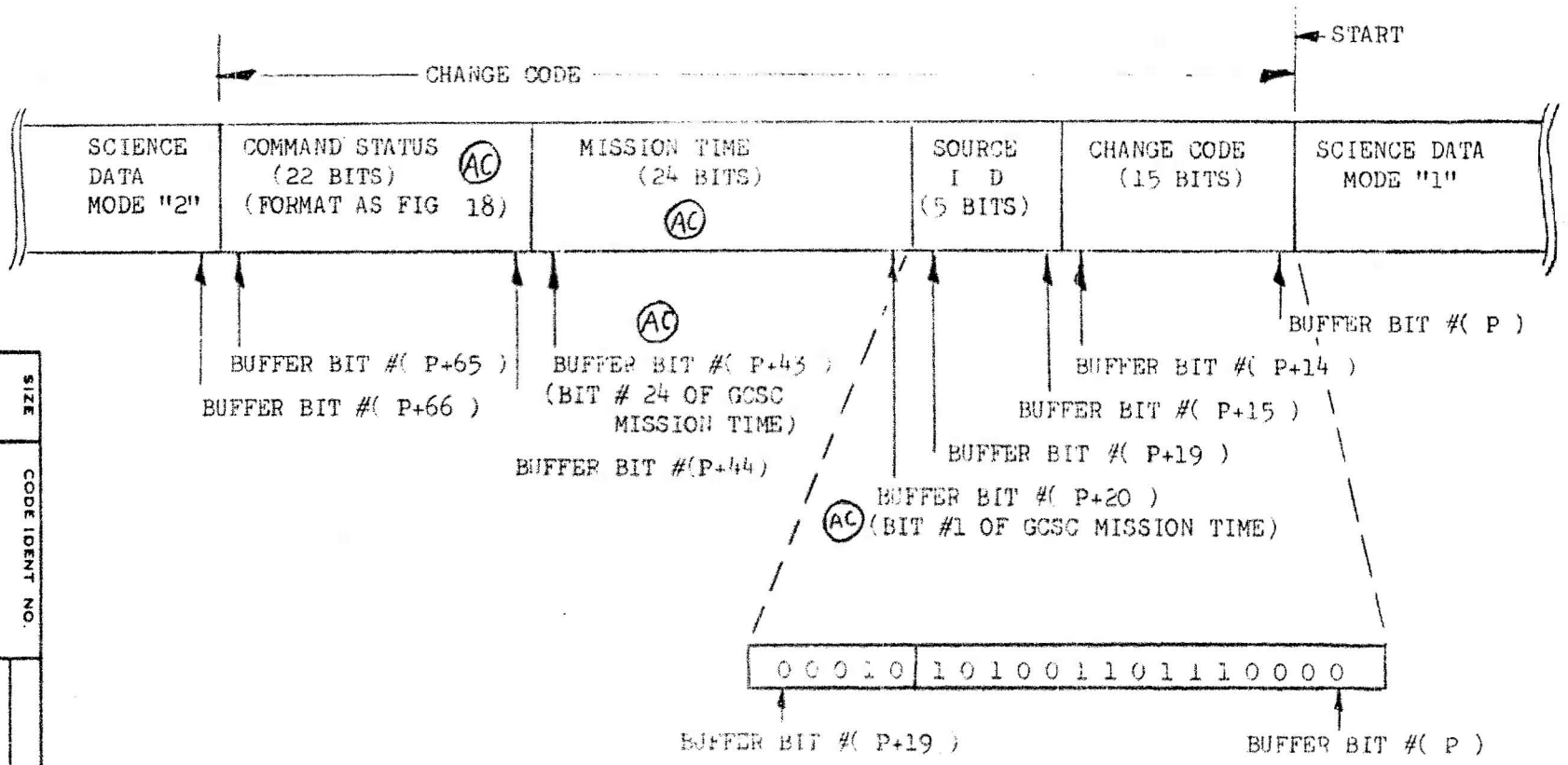


FIGURE 22 - CHANGE CODE FORMAT

CHG AC

SIZE A

CODE IDENT NO. 04236

SCALE

PAGE

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PD7400072

TABLE II - COMMAND DEFINITION

| | Commands | Bit Pattern | * Bit Position |
|---|---|---|---|
| 1. | Normal Mode | 00 & 11 | 1 & 2 |
| 2. | Event Mode | 01 | 1 & 2 |
| 3. | High Data Rate Mode | 10 | 1 & 2 |
| 4. | Vertical Attenuation 0 db | 100 | 6, 7 & 8 |
| 5. | Vertical Attenuation 6 db | 101 | 6, 7 & 8 |
| 6. | Vertical Attenuation 12 db | 110 | 6, 7 & 8 |
| 7. | Vertical Attenuation 18 db | 000 & 111 | 6, 7 & 8 |
| 8. | Vertical Attenuation 24 db | 001 | 6, 7 & 8 |
| 9. | Vertical Attenuation 30 db | 010 | 6, 7 & 8 |
| 10. | Vertical Attenuation 36 db | 011 | 6, 7 & 8 |
| 11. | Horizontal Attenuations 0 db | 100 | 3, 4 & 5 |
| 12. | Horizontal Attenuations 6 db | 101 | 3, 4 & 5 |
| 13. | Horizontal Attenuations 12 db | 110 | 3, 4 & 5 |
| 14. | Horizontal Attenuations 18 db | 000 & 111 | 3, 4 & 5 |
| 15. | Horizontal Attenuations 24 db | 001 | 3, 4 & 5 |
| 16. | Horizontal Attenuations 30 db | 010 | 3, 4 & 5 |
| 17. | Horizontal Attenuations 36 db | 011 | 3, 4 & 5 |
| 18. | Threshold Multiple -4 | 011 | 9, 10, 11 |
| 19. | Threshold Multiple -8 | 100 | 9, 10, 11 |
| 20. | Threshold Multiple -12 | All others | 9, 10, 11 |
| 21. | Threshold Multiple -16 | 001 | 9, 10, 11 |
| 22. | Threshold Multiple -20 | 010 | 9, 10, 11 |
| 23. | Filter Cutoff - 0.5 | 10 | 13 & 14 |
| 24. | Filter Cutoff - 1.0 | 01 | 13 & 14 |
| 25. | Filter Cutoff - 2.0 | 00 | 13 & 14 |
| 26. | Filter Cutoff - 4.0 | 11 | 13 & 14 |
| 27. | Filter Stepping | 0 | 12 |
| 28. | Fixed Filter | 1 | 12 |
| 29. | X Event Trigger Inhibit | 1 | 15 |
| 30. | Y Event Trigger Inhibit | 1 | 16 |
| 31. | Z Event Trigger Inhibit | 1 | 17 |
| 32. | X Event Trigger Enable | 0 | 15 |
| 33. | Y Event Trigger Enable | 0 | 16 |
| 34. | Z Event Trigger Enable | 0 | 17 |
| 35. | Not Used | | 20, 21, & 22 |
| 36. | Not Used | | 20, 21, & 22 |
| 37. | Calibrate Inhibit | 01 | 18 & 19 |
| 38. | Calibrate Enable | 00 & 11 & 10 | 18 & 19 |

AM

* NOTE: Indicates position in the 24 bit word with bit 1 being the third bit shifted into the command decoder and bit 22 being the last. The first two bits of the 24 bit word will always be zeros.