SPERRY UNIVAC

90/30 System

I/O Sense Data Byte Definitions Summary

SPERRY UNIVAC COMPUTER SYSTEMS

UP-8176

H

This document contains the latest information available at the time of publication. However, Sperry Univac reserves the right to modify or revise its contents. To ensure that you have the most recent information, contact your local Sperry Univac representative.

Sperry Univac is a division of Sperry Rand Corporation.

FASTRAND, PAGEWRITER, SPERRY UNIVAC, UNISCOPE, UNISERVO, and UNIVAC are trademarks of the Sperry Rand Corporation.

©1975 — SPERRY RAND CORPORATION PRINTED IN U.S.A.

CONTENTS

SENSE DATA BYTE	BIT 0	1	2	3	4	5	6	7
0	INVALID FUNCTION	INTERVENTION REQUIRED	BUS OUT CHECK	EQUIPMENT CHECK	DATA CHECK	DATA LATE	WORD COUNT ZERO	DATA CONVERTER CHECK
1	NOISE	TAPE UNIT STATUS A*	TAPE UNIT STATUS B*	7-TRACK*	LOAD POINT*	END-OF-TAPE*	FILE PROTECT*	NOT USED; ALWAYS ZERO
2	NOT USED							
	ALWAYS 0 BITS						ALWAYS 1 BITS	
3	READ VP ERROR	LP ERROR	SKEW	CRC READ ERROR	WRITE VP ERROR	NOT USED; ALWAYS 0	BACKWARD*	NOT USED; ALWAYS ZERO
			ALWAYS 0 BITS					ALWAYS 0 BITS
4	RUNAWAY CHECK	TAPE MOTION FAULT	RESERVED FOR FAILURE-FINDING MODE			STALL	TAPE FAULT	RESERVED FOR FAILURE-FINDING MODE

*Indicates bit that is conditioned by current status of tape unit.

Bit Position	Bit Designation	Definition
		Sense Data Byte 0
0	Invalid function	This bit is set if a write, write-tape-mark or erase operation was attempted on a file protected tape unit or if an invalid function was received by the control unit (in the second case, the bit will not be set if the bus out check bit is set).
1	Intervention required	Indicates that a nonexistent or nonready tape unit was addressed by a function other than a sense function. If this bit is set, the tape unit status A bit is not set (sense data byte 1).
2	Bus out check	Indicates that a function or data arrived with even parity on the bus out lines. If this condition is set on a data transfer during a write operation, the operation is terminated and the faulty byte is not written. If the parity error is detected on a first data transfer, the word count zero bit is also set. If the bus out check bit is set, the invalid function bit will not be set for a function transfer.
3	Equipment check	This bit indicates an equipment fault and is set whenever bit 0, 1, or 5 of sense data byte 4 is set.
4	Data check	This bit indicates a fault in data and is set whenever bit 0 of sense data byte 1 is set, or bit 0, 1, 2, 3, or 4 of sense data byte 3 is set.

Bit Position	Bit Designation	Definition
		Sense Data Byte 0 (cont)
5	Data late	This bit is set if service is requested on the interface lines but data cannot be transferred because of a late SERVICE OUT signal from the multiplexer channel. This bit is not set for the sense function.
6	Word count zero	This bit is set if during a write operation a data transfer is prevented when the first data byte is requested. No tape motion occurs when this condition is detected.
7	Data converter check	This bit, together with the unit check bit, (of the status bytes) indicates the number of bytes read during data conversion (where the data conversion feature is present) was incorrect.
		Sense Data Byte 1
0	Noise	For a write or write-tape-mark operation, an unsuccessful write occurred. because data (or electrical noise) was detected in the area allotted to the interblock gap. For a write or tape mark operation a tape fault occurred. In this case, the noise bit will be accompanied by the tape fault bit in sense data byte 4.

		For a read, read-backward, forward-space-block, or backspace-block operation, this bit indicates that data was detected in the interblock gap. Data after the longitudinal parity character turns on the noise bit and maintains tape motion but is not transferred. This condition may also be caused by a "dropout" of data in the block, causing false detection of longitudinal parity character. Such a dropout can be caused by bad tape (for example, wrinkled tape). This indication can usually be ignored on a space operation. If noise is detected after a true longitudinal parity character, successful completion of the operation is indicated; however, in most cases, the longitudinal parity error bit (sense data byte 3) will be set. Note that the dropout of two identical frames cannot be detected by the longitudinal parity character.
1	Tape unit status A	This bit indicates that the tape unit is selected and ready. If this bit is not set, the settings of bits 3—6 in sense data byte 1 are unreliable.
2	Tape unit status B	This bit indicates that the tape unit is rewinding, not ready, or under control of the other control unit.
3	7-Track	This bit indicates that the selected tape unit is a 7-track unit.
4	Load point	This bit indicates that the selected unit is positioned at load point. NOTE: Reading backward over the first block on a tape will not put the tape at load point.
5	End-of-tape	This bit indicates that the selected unit is positioned in the end-of-tape area.
6	File protect	This bit indicates that the tape on the selected unit does not have a write enable ring installed.

Bit Position	Bit Designation	Definition
		Sense Data Byte 1 (cont)
7	Tape handler busy	This bit is not used and is always a 0 bit.
		Sense Data Byte 2
		Sense data byte 2 is not used. Positions 0—5 always contain 0 bits; positions 6 and 7 always contain 1 bits.
		Sense Data Byte 3
0	READ VP error	A vertical parity (VP) error is detected on a cyclic redundancy check character (9-track only) or on a data character during a read or read-backward operation. The data late bit in sense data byte 0 (if set) will inhibit setting of this bit for the parity error condition. Data was not detected at the read head within 10 milliseconds after data recording commenced for a write or write-tape-mark operation.
1	Read LP error	This bit indicates that a longitudinal parity error was detected during a read or read backward operation, or during the automatic readback for a write or write-tape-mark operation.

2	Skew	This bit indicates that excessive skew was detected during the automatic readback for a write or write-tape-mark operation.
3	CRC read error	9-track only. This bit indicates that the cyclic redundancy character (CRC) calculated during a read operation is not the same as the stored CRC.
4	Write VP error	This bit indicates detection of a vertical parity (VP) error in a data frame or the CRC in the automatic readback during a write or write-tape-mark operation.
5		This bit is not used and is always a 0 bit.
6	Backward	Bit 6. Backward. This bit indicates that the selected unit is in a backward condition.
7		Bit 7. This bit is not used and is always a 0 bit.
Sense Data Byte 4		
0	Runaway check	During a write or write-tape-mark operation, no data was detected under the read head in the automatic readback within 10 milliseconds after writing commenced. During any read operation, no data was detected within 20 seconds.
1	Tape motion fault	The tape unit failed to respond to a START command. Tape motion may or may not have occurred. Tape motion stopped independently of the control unit during an operation requiring movement. The equipment check bit (sense data byte 0) will also be set. (This condition will occur if a backward operation extends motion into load point.)

Bit Position	Bit Designation	Definition
		Sense Data Byte 4 (cont)
2, 3, 4		Always zero and reserved for the failure finding mode using by maintenance personnel.
5	Stall	This bit indicates that the control unit is "hung-up" for more than 20 seconds. The unit check bit is set and the channel terminates the operation by initiating a status request.
6	Tape fault	This bit indicates that during a write or write-tape-mark operation an interblock gap was detected sooner than expected. This false end-of-block may be due to a loss of data for more than 800 microseconds (if this is the case, a backspace may not reposition the tape to the beginning of the written block).
7		Always zero and reserved for the failure finding mode used by maintenance personnel.

SENSE DATA BYTE	BIT 0	1	2	3	4	5	6	7
0	COMMAND REJECT	INTER-VENTION REQUIRED	BUS OUT CHECK	EQUIPMENT CHECK	DATA CHECK	OVERRUN	WORD COUNT ZERO	DATA CON-VERTER CHECK
1	NOISE	TAPE UNIT STATUS A*	TAPE UNIT STATUS B*	7-TRACK*	LOAD POINT*	END-OF-TAPE*	FILE PROTECT*	TAPE UNIT INCOMPATIBILITY
2	TRACK IN ERROR							
3	R/W VRC	MDT CHECK TRACK START FAILURE/LRC	SKEW	POSTAMBLE CHECK/CRC	W/VRC DEAD TRACK	TAPE UNIT 1600 BPI	BACKWARD*	NOT USED; ALWAYS 0
4	RUNAWAY CHECK	TAPE MOTION FAULT	FAILURE FINDING ALWAYS 0 BITS			STALL	TAPE FAULT	FAILURE FINDING

Bit Position	Bit Designation	Definition	
		Phase Encoding Mode	NRZI Mode
		Sense Data Byte 0	
0	Command reject	This bit is set if a write, write-tape-mark, or erase operation was attempted on a file protected tape unit or if an invalid command was received by the control unit (in the latter case, the bit is not set if the bus out check bit is set). Also, this bit is set if the tape unit incompatibility bit (bit 7, sense byte 1) is set.	Same as phase encoding mode.
1	Intervention required	When set, this bit indicates that a nonexistent or nonready tape unit was addressed by a command other than a sense command. If this bit is set, the tape unit status A bit (in sense data byte 1) is not set.	Same as phase encoding mode.
2	Output bus check	When set, this bit indicates that a command or data was received with even parity on the interface bus out lines. If this condition is set on a data transfer during a write operation, the operation is terminated and the faulty byte is not written. If the parity error is detected on a first data transfer, this bit and the word count zero bit (bit 6) will both be set.	Same as phase encoding mode. If this condition is detected during the data transfer on a request-TIE-command, the operation terminates but the information received is ignored. Any TIE information already stored is not affected.

Bit Position	Bit Designation	Definition	
		Phase Encoding Mode	NRZI Mode
Sense Data Byte 0 (cont)			
3	Equipment check	When set, this bit indicates an equipment fault. It is set whenever bit 0 (runaway check), bit 1 (tape motion fault), or bit 5 (stall) of sense data byte 4 is set.	Same as phase encoding mode.
4	Data check	When set, this bit indicates a data fault. It is set whenever bit 0 (noise) of sense data byte 1 is set, or bit 0 (read VRC error), bit 2 (skew), or bit 4 (write VRC error) of sense data byte 3 is set.	Same as phase encoding mode with bit 1 and bit 3 of sense byte 1 set.
5	Overrun	This bit is set if service is requested on the interface lines but data cannot be transferred because of a late SERVICE OUT signal from the selector channel. This bit is not set on the sense- or track-in-error commands. If this condition occurs on the first data transfer of a write operation, word count zero will be set in conjunction with this bit.	Same as phase encoding mode.
6	Word count zero	This bit is set if during a write operation data transfer is prevented when the first data byte is requested. No tape motion occurs when this condition is detected. This bit is set if end of block is detected on a read or read backward operation prior to detecting data.	Same as phase encoding mode.
7	Data converter check	This bit is not used and is always 0.	Set on 7-track operations only.

Sense Data Byte 1			
0	Noise	When reading or read checking data from phase encoded tapes, the checks performed to set the noise bit are essentially the same as those performed for NRZI recorded tapes. The variation in the checks are as follows: ■ When checking for tape hash, the outputs of the block detector circuits for each track are monitored. Since these circuits tend to reject noise, a single "bit-pick-up" would not activate the block detector outputs and the noise bit would not set. In NRZI recording, the noise bit would set, since the data lines are monitored directly. ■ When checking for gaps in the data, or data "dropouts", all block detector outputs must be deactivated together, before the noise bit sets. In phase encoding recording, a signal results from writing either a 1 bit or a 0 bit. Therefore, within the block, a signal is normally present in all tracks, and only a relatively serious condition could cause the noise bit to set (that is, a lateral crease in the tape). In NRZI recording, however, a signal is present only when 1 bits are written. Thus, a small defect in one track, when recording 1 bits only in that track, causes the noise bit to set.	When set, this bit indicates one of the following: ■ Tape mark — During write or write-tape-mark operations, data (or noise due to tape defects) was detected on read check sooner then was expected. ■ During erase operations, data (or noise due to tape defects) was detected on read check while the tape was being erased. ■ During write or write-tape-mark operations, while read checking the recorded data, a gap detected in the the data was not long enough to set the end-of-block condition.

Bit Position	Bit Designation	Definition	
		Phase Encoding Mode	NRZI Mode
Sense Data Byte 1 (cont)			
0	Noise (cont)		■ During read, read-backward, forward-space-block, and backspace-block operations, a data "dropout" which occurred on read was not long enough for the end-of-block condition to be detected. For above conditions, tape motion does not cease in the middle of the block. Writing or erasing continues until the normal termination point.
1	Tape unit status A	When set, this bit indicates that the tape unit is selected and ready.	Same as phase encoding.
2	Tape unit status B	When set, this bit indicates that the tape unit is rewinding, not ready, or under control of another control unit.	Same as phase encoding mode.

		Tape Unit Status A	Tape Unit Status B	Status Definition	Bit Set In Status Byte	
		0	0	Nonexistent	Unit check	
		0	1	Not ready	Unit check	
		1	0	Ready and not busy	—	
		1	1	Ready and busy, that is, rewinding or under control of other control unit	Unit check	
3	7-Track	When set, this bit indicates that the selected tape unit is a 7-track unit.				The selected unit has a 7-track head installed.
4	Load point	When set, this bit indicates that the selected unit is positioned at load point. NOTE: Reading backward over the first block on a tape does not put the tape at load point.				Same as phase encoding mode.

Bit Position	Bit Designation	Definition	
		Phase Encoding Mode	NRZI Mode
		Sense Data Byte 1 (cont)	
5	End-of-tape	When set, this bit indicates that the selected tape unit is positioned in the end-of-tape area.	Same as phase encoding mode.
6	File protect	When set, this bit indicates that the tape reel on the selected unit does not have a write enable ring.	Same as phase encoding mode.
7	Tape unit incompatibility	When set, this bit indicates one of the following conditions is present: 1. Addressed tape unit is a UNISERVO 12 or 16 7-track tape unit and is indicating the phase encoding mode of operation. 2. Addressed tape unit is a UNISERVO 12 or 16 9-track tape unit and failed to reset to 1600-bpi mode (load point only). 3. Tape unit is selected for a read operation from load point and addressed tape unit is a 9-track UNISERVO 12 or 16 tape unit and failed to set to 800-bpi mode when the tape was written in the 800-bpi mode. 4. A write operation was attempted with a UNISERVO 12 tape unit on the second control unit.	Same as phase encoding mode. Tape unit is selected for "write-type" operation from load point and unit addressed is a UNISERVO 12 or UNISERVO 16 9-track tape unit and failed to set to 800-bpi mode.

Sense Data Byte 2			
0	Track in error	Not Applicable	This bit is utilized to indicate track errors when a data check has occurred at the conclusion of a read or read-backward operation. A single 1-bit in any track indicates the track in error; a 1-bit in bit positions 6 and 7 indicates that a multiple track error has occurred and no track and no track error identification has been made. Binary 0's in bits 0 through 7 imply list P. At the completion of a properly executed read or read-backward operation with no data check, sense byte 2 contains at least bits 6 and 7 set to 1's. No error correction is attempted when operating with 7-track tape units. Bits 6 and 7 are set to 1's in sense byte 2.

Bit Position	Bit Designation	Definition	
		Phase Encoding Mode	NRZI Mode
		Sense Data Byte 3	
0	R/W VRC	When set, this bit indicates vertical redundancy check occurred on a data frame when no marginal signal was detected in any track.	When set, this bit indicates the following: ■ A vertical redundancy check occurred on a data frame or CRC frame during a read or read-backward operation. This indicator is not set after an overrun indication. ■ A speed check error occurred during a write or write-tape-mark operation.
1	LRC/multiple dead track/ track start failure	When set, indicates one of the following conditions has occurred: ■ A marginal signal occurred in more than one track on a read or read-backward operation.	When set, this bit indicates that a longitudinal redundancy check occurred during a write, write-tape-mark, read, or read-backward operation.

		■ Valid information was not detected in at least one track while read checking the preamble during a write operation. This indicates a track start failure, possibly indicating the track was never written on the tape. This check is performed only during the preamble before the circuits. Normally bit 4 of sense byte 3 is set in conjunction with this bit if the track is missing entirely.	
2	Skew	When set, this bit indicates that excessive skew was detected during the automatic readback for a write or write-tape-mark operation.	Excessive skew detected while read checking during write or write-tape-mark operation.
3	Postamble check/CRC	Set when the postamble following the data is not read correctly.	A CRC occurred during a read or read-backward operation (9-track only).
4	Dead track check/W VRC	When set, this bit indicates one of the following conditions has occurred: ■ At least one track with marginal signal during write or write-tape-mark operations.	A vertical redundancy check occurred on a data frame or CRC frame during a write or write-tape-mark operation.

Bit Position	Bit Designation	Definition	
		Phase Encoding Mode	NRZI Mode
Sense Data Byte 3 (cont)			
4	Dead track check/W VRC (cont)	■ A marginal signal in only one track during a read or read-backward operation (correctable error). This bit does not set if a multiple track error occurs. (See bit 1.) If I=1 in the read command code and this bit is set and I=0 in the read command code, data check will not set. In either case, the data is correct. ■ Indicates that a tape mark was not properly detected on the read check of a write-tape-mark operation.	
5	Tape unit-1600 bpi	When set, this bit indicates the selected tape unit is set to 1600-bpi mode.	Same as phase encoding mode. Bit is always set to 0 when selecting 7-track tape unit.
6	Backward	When set, this bit indicates the selected tape unit is conditioned for backward tape motion.	Same as phase encoding mode.
7		This bit is not used and is always 0.	Same as phase encoding mode.
Sense Data Byte 4			
0	Runaway check	This bit is set by any of the following conditions:	Same as phase encoding mode.

		■ During a write or write-tape-mark operation, the end of block was not detected under the read head within at least 8.3 ms (UNISERVO 12) or 2.1 ms (UNISERVO 16) after writing ceased. ■ During all read operations, if data is not detected within at least 7.0 seconds (UNISERVO 12) or 2.5 seconds (UNISERVO 16).	
1	Tape motion fault	This bit is set by any of the following conditions: ■ The tape unit failed to respond to a start command. Tape motion may or may not have occurred. ■ Tape motion stopped independently of the control unit during an operation requiring tape movement. (This condition will occur if a backward operation extends motion into the load point.)	Same as phase encoding mode.
2, 3, and 4		These bits are not used, are always 0, and are reserved for the failure finding mode used by maintenance personnel.	Same as phase encoding mode.
5	Stall	When set, this bit indicates that the control unit is "hung up" for more than 2.5 seconds. The unit check bit (status byte) is set, and the control unit terminates the operation by initiating a status request.	Same as phase encoding mode.

Bit Position	Bit Designation	Definition	
		Phase Encoding Mode	NRZI Mode
Sense Data Byte 4 (cont)			
6	Tape fault	When set, this bit indicates that during a write or write-tape-mark operation an interblock gap was detected sooner than expected. This false end of block may be due to a loss of data for more than 790 microseconds on a UNISERVO 12 or UNISERVO VI-C, or more than 280 microseconds on a UNISERVO 16 or UNISERVO VIII-C (if this is the case, a backspace may not re-position the tape to the beginning of the written block).	Same as phase encoding mode.
7		This bit is not used and is always 0. It is reserved for the failure finding mode used by maintenance personnel.	Same as phase encoding mode.

SENSE DATA BYTE	BIT 0	1	2	3	4	5	6	7
0	COMMAND REJECT	INTERVENTION REQUIRED	BUS OUT CHECK	EQUIPMENT CHECK	DATA CHECK	OVERRUN	WORD COUNT ZERO	DATA CONVERTER CHECK
1	NOISE	TAPE UNIT STATUS A*	TAPE UNIT STATUS B*	7-TRACK*	LOAD POINT*	END-OF-TAPE*	FILE PROTECT*	TAPE UNIT INCOMPATIBILITY
2	TRACK IN ERROR							
3	R/W VRC	MDT CHECK TRACK START FAILURE/LRC	SKEW	POSTAMBLE CHECK/CRC	W/VRC DEAD TRACK	TAPE UNIT 1600 BPI*	BACKWARD*	NOT USED; ALWAYS 0
4	RUNAWAY CHECK	TAPE MOTION FAULT	SPEED CHECK (UNISERVO 20 ONLY)	TEST / ALWAYS 0 BITS		STALL	TAPE FAULT	TEST

*Indicates bit that is conditioned by current status of tape unit.

Bit Position	Bit Designation	Definition	
		Phase Encoding Mode	NRZI Mode
Sense Data Byte 0			
0	Command reject	This bit is set if a write, write-tape-mark, or erase operation was attempted on a file protected tape unit or if an invalid command was received by the control unit (in the latter case, the bit is not set if the bus out check bit is set). Also, this bit is set if the tape unit incompatibility bit (bit 7, sense byte 1) is set.	Same as phase encoding mode.
1	Intervention required	When set, this bit indicates that a nonexistent or nonready tape unit was addressed by a command other than a sense command. If this bit is set, the tape unit status A bit (in sense data byte 1) is not set.	Same as phase encoding mode.
2	Bus out check	When set, this bit indicates that a command or data was received with even parity on the interface bus-out lines. If this condition is set on a data transfer during a write operation, the operation is terminated and the faulty byte is not written. If the parity error is detected on a first data transfer, this bit and the word count 0 bit (bit 6) will both be set.	Same as phase encoding mode. If this condition is detected during the data transfer on a request-TIE command, the operation terminates but the information received is ignored. Any TIE information already stored is not affected.
3	Equipment check	When set, this bit indicates an equipment fault. It is set whenever bit 0 (runaway check), bit 1 (tape motion fault), or bit 5 (stall) of sense data byte 4 is set.	Same as phase encoding mode.

Bit Position	Bit Designation	Definition	
		Phase Encoding Mode	NRZI Mode
		Sense Data Byte 0 (cont)	
4	Data check	When set, this bit indicates a data fault. It is set whenever bit 0 (noise) of sense data byte 1 is set, or bit 0 (read VRC error), bit 2 (skew), bit 3 (postamble check/CRC) or bit 4 (write VRC error) of sense data byte 3 is set.	Same phase encoding mode.
5	Overrun	This bit is set if service is requested on the interface lines but data cannot be transferred because of a late SERVICE OUT signal from the MSA. This bit is not set on the sense or request-TIE commands. If this condition occurs on the first data transfer of a write operation, word count zero will be set in conjunction with this bit.	Same as phase encoding mode.
6	Word count zero	This bit is set if data transfer is prevented during a write operation when the first data byte is requested. This can be due to a command out response to a data byte request, even parity detected for the data byte transfer, or a channel overload. No tape motion occurs when this condition is detected. If nonstop operation is indicated, the previous operation will terminate properly. This bit is set if end of block is detected on a read or read-backward operation prior to detecting data (missed start sentinel).	Same as phase encoding mode.
7	Data converter check	This bit is not used and is always 0.	Set on 7-track operations only.

Sense Data Byte 1			
0	Noise	When reading or read checking data from phase encoded tapes, the checks performed to set the noise bit are essentially the same as those performed for NRZI recorded tapes. The variation in the checks are as follows: ■ When checking for tape hash, the outputs of the block detector circuits for each track are monitored. Since these circuits tend to reject noise, a single bit pickup would not activate the block detector outputs and the noise bit would not be set. In NRZI recording, the noise bit would be set, since the data lines are monitored directly. ■ When checking for gaps in the data, or data drop-outs, all block detector outputs must be deactivated together, before the noise bit is set. In phase encoding recording, a signal results from writing either a 1 bit or a 0 bit. Therefore, within the block, a signal is normally present in all tracks, and only a relatively serious condition could cause the noise bit to be set (that is, a lateral crease in the tape). In NRZI recording, however, a signal is present only when 1 bits are written. Thus, a small defect in one track, when recording 1 bits only in that track, causes the noise bit to be set.	When set, this bit indicates one of the following: ■ Tape hash — During write or write-tape-mark operations, data (or noise due to tape defects) was detected on read check sooner then was expected. ■ During erase operations, data (or noise due to tape defects) was detected on read check wile the tape was being erased. ■ During write or write-tape-mark operations, while read checking the recorded data, a gap detected in the data was not long enough to set the end-of-block condition.

Bit Position	Bit Designation	Definition	
		Phase Encoding Mode	NRZI Mode
		Sense Data Byte 1 (cont)	
0	Noise (cont)	The noise bit, should be set relatively infrequently, as compared to the NRZI mode.	■ During read, read-backward, forward-space-block, and backspace-block operations, a data drop out which occurred on read was not long enough for the end-of-block condition to be detected. For above conditions, tape motion does not cease in the middle of the block. Writing or erasing continues until the normal termination point. ■ Bit 6 of sense byte 4 was set (tape fault).
1*	Tape unit status A	When set, this bit indicates that the tape unit is selected and ready.	Same as phase encoding mode.
2*	Tape unit Status B	When set, this bit indicates that the tape unit is rewinding, not ready, or under control of another control unit.	Same as phase encoding mode.

		Tape Unit Status	Tape Unit Status	Status Tape Unit	Bit Set In Status Byte	
		A	B			
		0	0	Nonexistent	Unit Check	
		0	1	Not ready	Unit check	
		1	0	Ready and not busy	—	
		1	1	Ready and busy; that is, rewinding or under control of other control unit	Unit check	
3*	7-Track	When set, this bit indicates that the selected tape unit is a 7-track unit.				The selected unit has a 7-track head installed.
4*	Load point	When set, this bit indicates that the selected unit is positioned at load point. NOTE: Reading backward over the first block on a tape does not put the tape at load point.				Same as phase encoding mode.

Bit Position	Bit Designation	Definition	
		Phase Encoding Mode	NRZI Mode
		Sense Data Byte 1 (cont)	
5*	End of tape	When set, this bit indicates that the selected tape unit is positioned in the end-of-tape area.	Same as phase encoding mode.
6*	File protect	When set, this bit indicates that the tape reel on the selected unit does not have a write enable ring.	Same as phase encoding mode.
7	Tape unit incompatibility	When set, this bit indicates one of the following conditions is present: ■ Addressed tape unit is a 7-track UNISERVO 12 or 16 and is indicating the phase encoding mode of operation. ■ Addressed tape unit is a 9-track UNISERVO 12, 16, or 20 and failed to reset to 1600-bpi mode (load point only). ■ Tape unit is selected for a read operation from load point and addressed tape unit is a 9-track UNISERVO 12, 16, or 20 and failed to set to 800-bpi mode when the tape was written in the 800-bpi mode. This condition is detected after the first read operation is initiated. If a read command is to be attempted again, a rewind command is required to reposition the tape.	Same as phase encoding mode. Tape unit is selected for write operation from load point and unit addressed is a 9-track UNISERVO 12, 16, or 20 and failed to set to 800-bpi mode. NOTE: Tape motion does not occur as a result of attempted operation.

Sense Data Byte 2			
0–7	Track in error	Not applicable	This byte is utilized to indicate track errors when a data check has occurred at the conclusion of a read or read-backward operation. A single 1-bit in any track indicates a single track in error; the bit position indicates the track in error. A 1-bit in bit positions 6 and 7 indicates that a multiple track error has occurred and no track error identification has been made. Binary 0's in bits 0–7 imply bit P. At the completion of a properly executed read or read-backward operation with no data check, sense byte 2 contains at least bits 6 and 7 set to 1's. No error correction is attempted when operating with 7-track tape units. Bits 6 and 7 are set to 1's in sense byte 2.

Bit Position	Bit Designation	Definition	
		Phase Encoding Mode	NRZI Mode
		Sense Data Byte 3	
0	R/W VRC speed check	When set, this bit indicates the following: ■ Vertical redundancy check (VRC) has occurred on a data frame without a dead track indication during a write, read, or read-backward operation. ■ Excessive amount of speed variation occurred during a write operation. Set in conjunction with bit 2 of sense byte 4 for UNISERVO 20 control unit only.	When set, this bit indicates the following: ■ A vertical redundancy check occurred on a data frame or CRC frame during a read or read backward operation. This indicator is not set after an overrun indication. ■ A speed check error occurred during a write or write-tape-mark operation.
1	LRC/multiple dead track/ track start failure	When set, indicates one of the following conditions: ■ A marginal signal occurred in more than one track on a read or read-backward operation. ■ Valid information was not detected in at least one track while read checking the preamble during a write operation. This indicates a track start failure, possibly indicating the track was never written on the tape. This check is performed only	When set, this bit indicates that a longitudinal redundancy check occurred during a write, write-tape-mark, read, or read-backward operation.

		during the preamble before the circuits that detect marginal signal are operable. Normally bit 4 of sense byte 3 is set in conjunction with this bit if the track is missing entirely.	
2	Skew	When set, this bit indicates that excessive skew was detected during a write, read, or read-backward operation (deskew register overflow).	Excessive skew detected while read checking data on write or write-tape-mark operation.
3	Postamble check/CRC	Set when the postamble following the data is not read correctly or is recognized before the actual end of data (early stop sentinel).	A CRC error was detected during a read or read-backward operation (9-track only).
4	Dead track check/W VRC	When set, this bit indicates one of the following conditions: ■ At least one track with marginal signal during write or write-tape-mark operations. ■ A marginal signal in only one track during a read or read-backward operation (correctable error). This bit does not set if a multiple-track error occurs. (See bit 1.) If I = 1 in the read command code and this bit is set, unit check is set. However, if this bit is set and I = 0 in the read command code, unit check is not set. In either case, the data is correct. ■ Indicates that a tape mark was not properly detected on the read check of a write-tape-mark operation.	A vertical redundancy check occurred on a data frame or CRC frame during a write or write-tape-mark operation.

Bit Position	Bit Designation	Definition	
		Phase Encoding Mode	NRZI Mode
		Sense Data Byte 3 (cont)	
5*	Tape unit-1600 bpi	When set, this bit indicates the selected tape unit is set to 1600-bpi mode.	Same as phase encoding mode. Bit is always set to 0 when selecting 7-track tape unit.
6*	Backward	When set, this bit indicates the selected tape unit is conditioned for backward tape motion.	Same as phase encoding mode.
7		This bit is not used and is always 0.	
		Sense Data Byte 4	
0	Runaway check	This bit is set by any of the following conditions: ■ While read checking recorded data during a write or write-tape-mark operation, the end of block was not detected under the read head within at least 8.3 msec (UNISERVO 12), 2.9 msec (UNISERVO 16), 0.91 msec (UNISERVO 20) after writing ceased. ■ During all read operations, if data is not detected within at least 7.0 seconds (UNISERVO 12) or 2.5 seconds (UNISERVO 16 or 20).	Same as phase encoding mode.

1	Tape motion fault	This bit is set by any of the following conditions: ■ The tape unit failed to respond to a start command. Tape motion may or may not have occurred. ■ Tape motion stopped independently of the control unit during an operation requiring tape movement. (This condition will occur if a backward operation extends motion into the load point.) This bit sets in conjunction with bit 2, sense byte 4.	Same as phase encoding mode.
2	Speed check (UNISERVO 20 control unit only)	This bit is set by any of the following conditions: ■ An excessive amount of speed variation during a write operation. Set in conjunction with bit 0 of sense byte 3. ■ During a write operation, the tape unit fails to: — accelerate to specified speed, or — achieve minimum interblock gap spacing. Set in conjunction with bit 1 of sense byte 9.	Always set to 0.

Bit Position	Bit Designation	Definition	
		Phase Encoding Mode	NRZI Mode
Sense Data Byte 4 (cont)			
3, 4, and 7	Test	These bits are not used, are always 0, and are reserved for the failure finding mode used by customer engineer.	Same as phase encoding mode.
5	Stall	When set, this bit indicates that the control unit is "hung up" for more than 2.5 seconds. Stall sense bit will not set if either bits 0 or 1 of sense byte 4 is set.	Same as phase encoding mode.
6	Tape fault	When set, this bit indicates that during a write or write-tape-mark operation an end-of-block gap was detected sooner than expected. This false end of block may be due to a loss of data for more than 790 microseconds on a UNISERVO 12, more than 280 microseconds on a UNISERVO 16, or 2 bit times for a UNISERVO 20.	Same as phase encoding mode.

SENSE DATA BYTE	BIT 0	1	2	3	4	5	6	7
1	COMMAND REJECT	INTERVENTION REQUIRED, FORMS OUT, RUNAWAY	BUS OUT CHECK	EQUIPMENT CHECK	DATA CHECK	OVERRUN	INHIBIT STATUS	NOT READY
2	CODE BUFFER PARITY ERROR	DATA BUFFER PARITY ERROR	ONCE PER REVOLUTION ERROR	SPROCKET ERROR	SCAN ERROR	EARLY TERMINATE	STOP	SELECTIVE RESET/INTERFACE DISCONNECT

Bit Position	Bit Designation	Definition
		Sense Data Byte 1
0	Command reject	When set, this bit indicates that an invalid command was issued by the multiplexer channel.
1	Intervention required	When set, this bit indicates forms out or forms runaway.
2	Bus out check	When set, this bit indicates a parity error in a command or data transfer to the control unit. A parity error detected during a command causes immediate termination; on data transfers, there is no immediate termination.
3	Equipment check	When set, this bit indicates that a print hammer fuse fault signal was generated during the last printing operation.
4	Data check	When set, this bit indicates a parity error in either the print line or code drum buffer.
5	Overrun	When set, this bit indicates that the print line was not completed during one revolution of the print drum. This condition can be caused by a hardware error or by a character code placed in the print line buffer and no corresponding code in the code drum buffer.
6	Inhibit status	When set, this bit indicates that the inhibit status in flip-flop is set, preventing a status byte from being sent to the multiplexer channel.
7	Not ready	When set, this bit indicates a ribbon out or carriage out condition.

Bit Position	Bit Designation	Definition
		Sense Data Byte 2
0	Code buffer parity error	When set, this bit indicates a parity error in the code drum buffer.
1	Data buffer parity error	When set, this bit indicates a parity error in the print line buffer.
2	Once per revolution error	When set, this bit indicates that the sprocket code counter did not contain a count of 63 when the once-per-revolution pulse occurred. (This indicates a hardware error.)
3	Sprocket error	When set, this bit indicates identical data pulses on two consecutive sprocket pulses. (This condition is a hardware fault, which requires corrective action.)
4	Scan error	When set, this bit indicates that a sprocket pulse occurred before the scan cycle was completed. (This condition is a hardware fault, which requires corrective action.)
5	Early terminate	When set, this bit indicates that the multiplexer channel terminated the transfer of data to the code drum buffer before 63 characters had been stored. This bit will be set only during a load code command.

6	Stop	Pressing the STOP switch/indicator causes this bit and the unit check bit (bit 6) of the status bit to be set. This is an operator action stop. It is set at the completion of the current operation. (An error condition causing the PRINT CHECK, FORMS RUNAWAY, FORMS OUT, or RIBBON CHECK indicators on the upper row of indicators on the right-hand control panel to light, sets this bit, unit check bit (bit 6), and the appropriate bits in the sense byte.) The test, sense, read, and load code commands can be performed when in the stop mode (and not offline). The read and load code commands cannot be executed during a power check, interlock, or temperature check alarm condition.
7	Selective reset/ interface disconnect	When set, this bit indicates that a selective reset/interface disconnect sequence occurred since the last sense command was issued.

SENSE DATA BYTE	BIT 0	1	2	3	4	5	6	7
0	COMMAND REJECT	INTERVENTION REQUIRED	BUS OUT CHECK	EQUIPMENT CHECK	DATA CHECK	VERTICAL FORMAT CHECK	BUFFER LOAD CHECK	COMMAND RETRY
1	EARLY TERMINATE	INHIBIT DATA CHECK	INHIBIT STATUS IN	FOLD DATA	DIAGNOSTIC GATE	INTERFACE DISCONNECT/ SELECTIVE RESET	VERTICAL FORMAT REQUEST	LOAD CODE REQUEST
2	ADVANCE CHECK	FORMS LOW	FORMS POSITION CHECK	CARTRIDGE CODE CHECK	CODE 9	FORMS CHECK	RIBBON CHECK	TYPE SPEED CHECK
3	LOAD CODE BUFFER PARITY CHECK	PRINT LINE BUFFER PARITY CHECK	VERTICAL FORMAT BUFFER PARITY CHECK	UNASSIGNED	PRINT ACTUATOR CHECK	UNASSIGNED	UNASSIGNED	UNASSIGNED
4	This byte contains diagnostic information during execution of a print-advance command when diagnostic mode is set.							
5	EXPANDED FONT	160 PRINT POSITIONS	LOW SPEED	UNASSIGNED	UNASSIGNED	UNASSIGNED	DIAGNOSTIC	DIAGNOSTIC

Bit Position	Bit Designation	Definition
		Sense Data Byte 0
0	Command reject	This bit is set when an invalid command was issued by the channel.
1	Intervention required	This bit is set when operator action is required because the printer is in the stop mode due to any of the following: ■ out of forms — forms low (sense data byte 2, bit 1) has been detected and the form has been advanced to the bottom of the form; ■ forms check (bit 5 of sense data byte 2); ■ stacker full; ■ STOP switch activated; ■ ribbon check (bit 6 of sense data byte 2); ■ interlock — power check — carriage check — casework check

Bit Position	Bit Designation	Definition
		Sense Data Byte 0 (cont)
1	Intervention required (cont)	■ forms position check (bit 2 of sense data byte 2); ■ type speed check (bit 7 of sense data byte 2); or ■ advance check (bit 0 of sense data byte 2).
2	Bus out check	This bit is set when a parity error is detected on the channel during a transfer to the printer. A parity error detected in a command code causes an immediate termination. A parity error detected in a data transfer causes termination of the command following the data transfer sequence.
3	Equipment check	This bit is set when any of the following occurs: ■ actuator check (bit 4 of sense data byte 3); ■ advance check (bit 0 of sense data byte 2); ■ parity error in — load code buffer (bit 0 of sense data byte 3) — print line buffer (bit 1 of sense data byte 3) — vertical format buffer (bit 2 of sense data byte 3)

4	Data check	This is set when a noncompare is detected between a character in the print line buffer and the characters in the load code during the print compare sequence, provided inhibit data check is not active. When this bit is set, all characters are printed except those not compared, and the advance portion of a print-advance command is executed.
5	Vertical format check	This bit is set when a noncompare was detected between the skip code in a print-advance, advance-print, or an advance-only command, and codes in the vertical format buffer. When this bit is set, advance is not executed.
6	Buffer load check	This bit is set with any of the following sense data byte bits: ■ vertical format request (bit 6 of sense data byte 1); ■ load code request (bit 7 of sense data byte 1); or ■ early terminate (bit 0 of sense data byte 1).
7	Command retry	This bit is set during the print compare sequence when a parity error is detected in the print line buffer or in the load code buffer. All columns are printed except those affected by the parity error. If the equipment check bit (bit 3 of sense data byte 0) is set and load code buffer check (bit 0 of sense data byte 3) is set, the parity error occurred in the load code buffer. If the equipment check bit (bit 0 of sense data byte 0) is set and print line buffer check bit (bit 1 of sense data byte 3) is set, the parity error occurred in the print line buffer. When the command is reissued, the printer retries only those columns affected by the parity error.

Bit Position	Bit Designation	Definition
		Sense Data Byte 0 (cont)
7	Command retry (cont)	When this bit is set, the advance portion of a print-advance command is not executed. If a faulty print-advance command was issued, the form advances in accordance with the successful retried command or according to the ACDEF detail bits of the advance-only command; however, if ACDEF = 10000 the form is advanced in accordance with the ACDEF detail bits of the faulty print-advance command that caused command retry. A successful retry or issuing an advance-only command resets the command retry bit.
		Sense Data Byte 1
0	Early terminate	This bit is set when: ■ less than 50 (59*) characters were transferred during loading of the load code buffer on a printer without expanded character feature (F1534—00); ■ less than 26 (35*) characters were transferred during loading of the load code buffer on a printer with expanded character feature (F1534—00); ■ end of form was not detected by the printer during load-vertical-format command. NOTE: If end of form is not detected by the 192nd byte, the data transfer sequence is terminated.

1	Inhibit data check	This bit indicates inhibit-data-check flip-flop is set.
2	Inhibit status in	This indicates inhibit-status-in flip-flop is set.
3	Fold data	This bit indicates fold flip-flop is set (3.2.10).
4	Diagnostic gate	This bit indicates the printer is in diagnostic timing mode (3.2.21).
5	Interface disconnect/ selective reset	This bit indicates interface disconnect or selective reset occurred during the data transfer sequence. If this bit is set, it indicates the command was not executed.
6	Vertical format request	This bit indicates the vertical format buffer has not been properly loaded; that is, the buffer was not loaded, loaded with an early terminate (bit 0 of sense data byte 1), or bus out check (bit 2 of sense data byte 0) indication was present during loading. NOTE: The printer cannot execute an advance because the 6/8 lpi criterion for advancing has not been received.
7	Load code request	This bit indicates the load code buffer has not been properly loaded.

Bit Position	Bit Designation	Definition
		Sense Data Byte 2
0	Advance check	This bit is set when the forms advance operation was not completed within: ■ 700 ms for type 0770—00/01 printer; ■ 500 ms for type 0770—02/03 printer; or ■ 400 ms for type 0770—04/05 printer. This condition could occur for any of the following: ■ stalled advance mechanism; ■ slow advance; or ■ forms runaway. This condition prevents the current print-advance, advance-print, or advance-only command from being executed.
1	Forms low	This bit is set when approximately 2.5 inches (8,35 cm) of the last form remains. When this bit is set it causes unit check bit to be set only once.
2	Forms position check	This bit is set when the forms advance operation detects the form did not stop in proper position. This condition prevents the current print-advance, advance-print, or advance-only command from being executed.

3	Cartridge code check	This bit is set when the cartridge identification code does not agree with the cartridge verification code issued with the load-code command. Also, it causes immediate termination of a print-advance or advance-print command if the stored cartridge verification code does not equal the cartridge identification code when the command is initiated.
4	Code 9	Presented with device end of a print-advance, advance-print, or advance-only command that has detail advance bit A = 0 (advance by spacing). This bit indicates the advance called for would have advanced the form to or beyond the line corresponding to code 9; therefore the form does not advance. The line is printed for a print-advance command but the forms advance operation is not executed. The line is not printed for an advance-print command and the forms advance operation is not executed. The form does not advance for an advance-only command. A test is not made for code 9 on the next print-advance, advance-print, or advance-only command; therefore this sense condition is not presented and the form advances according to the ACDEF detail bits in the new command. The form advances for detail bits ACDEF = 10000 (advance repeat) in accordance with ACDEF detail bits of the advance causing code 9.
5	Forms check	This bit is set when either a torn form or a forms-jam condition is detected. This condition prevents the current print-advance, advance-print, or advance-only command from being executed.
6	Ribbon check	This bit is set when a malfunction is detected during ribbon motion.
7	Type speed check	This bit is set during the print-compare sequence when the print band is not at proper speed or not synchronized with the logic. Some printing may have occurred prior to this bit being set; however, once set, it inhibits all further printing.

Bit Position	Bit Designation	Definition
		Sense Data Byte 3
0	Load code buffer parity check	This bit is set when a parity error is detected in the load code buffer. If the error is detected during the print-compare sequence, it causes the command retry bit (bit 7 of sense data byte 0) to be set.
1	Print line buffer parity check	This bit is set when a parity error is detected in the print line buffer. If the error is detected during the print-compare sequence, it causes the command retry bit (bit 7 of sense data byte 0) to be set.
2	Vertical format buffer parity check	This bit is set when a parity error is detected in the vertical format buffer. If the parity error is detected with an advance-print or advance-only command, the command is not to be executed. If the error is detected with a print-advance command, the line is printed but the form is not advanced.
3	Unassigned	
4	Actuator check	This bit is set when an actuator fails to fire due to a malfunction of the actuator circuitry. When this condition is detected, all columns are printed except those with a malfunction.
5	Unassigned	
6	Unassigned	
7	Unassigned	

Sense Data Byte 4		
0–8		This byte contains diagnostic information during execution of a print-advance command when diagnostic mode is set.
Sense Data Byte 5		
0	Expanded font	This bit is set to indicate printer F1534–00 is installed.
1	160 position	This bit is set to indicate printer F1533–00 is installed.
2	Low speed	This bit is set when the printer is operating with the print band SPEED SELECT switch in LOW position.
3	Unassigned	
4	Unassigned	
5	Unassigned	
6	Diagnostic	Used to store overflow bits of the print hammer flight time in sense data byte 4.
7	Diagnostic	

SENSE DATA BYTE	BIT 0	1	2	3	4	5	6	7
0	COMMAND REJECT	INTERVENTION REQUIRED	BUS OUT CHECK	EQUIPMENT CHECK	DATA CHECK	OVERRUN	STOP STATE	DEVICE CHECK
1	FORMS OUT	FORMS LOW	VFB CHECK	FORMS CHECK	BAND CHECK	PRINT LINE BUFFER PARITY ERROR	VERTICAL FORMAT REQUEST/PARITY ERROR	LOAD CODE REQUEST/ PARITY ERROR

Bit Position	Bit Designation	Definition
		Sense Data Byte 0
0	Command reject	This sense bit indicates a command reject. This bit is generated during an SIO sequence whenever output of the command register is not decoded as a valid command. Unit check status is set and printer control becomes active.
1	Intervention required	This sense bit indicates that an operator intervention is required.
2	Bus out check	Not used; set to 0.
3	Equipment check	This sense bit indicates a print check. It is set if an actuator circuit check or band check (SB1,4) error is detected and also if either fuse check or latch check is detected.
4	Data check	This sense bit indicates a parity error detected in the vertical format buffer (SB1,6).
5	Overrun	This sense bit indicates an overrun condition. It is generated when there is one or more unprintable characters in the print line buffer; no matching code is found in the code buffer.
6	Stop state	This sense bit indicates that the printer is in the stop state. The printer enters the stop state via the STOP switch or an error condition.

Bit Position	Bit Designation	Definition
		Sense Data Byte 0 (cont)
7	Device check	This sense bit indicates a device check is required. It is generated when one of the following errors occurs and causes printer control to enter the stop state: ■ blower or ribbon check ■ interlock active If device check status occurs during a print or advance command, the command is immediately terminated.
		Sense Data Byte 1
0	Forms out	This sense bit indicates that the printer is out of paper. It is generated when an advance to or past-home-paper position has occurred after a forms-low indication. Setting this bit causes entry into the stop mode and cannot be cleared until paper has been loaded in the printer.
1	Forms low	This sense bit is set if less than 6 inches of paper remains in the paper supply. The lower tractors may no longer contain paper. Setting this bit causes entry into the stop state; the run mode can be reentered until a forms out (SB1,0) is generated. Unit check status is only generated when this condition (forms low) is first detected.
2	VFB check	This sense bit indicates a paper runaway was detected during an advance setup sequence. It is set if an advance command is issued and the skip code, specified by the C, D, E, and F bits (A = 1), is not present in the vertical format buffer. No paper advance takes place.

3	Forms check	This sense bit indicates a forms check. It is set if any individual paper advance exceeds 1.1 seconds or a forms-jam condition was detected.
4	Band check	This sense bit is set if no timing marks are detected within 1 millisecond, or an incorrect number of timing marks is detected between 2 font marks. Detection of timing marks begins 5 seconds after power is applied to the print band motor.
5	Print line buffer parity error	This sense bit is set if a parity error is detected when reading the print line buffer or during a print setup sequence.
6	Vertical format request/parity error	This sense bit is set if one of the following conditions is present: 1. A parity error is detected when accessing the vertical format buffer. 2. A print-advance or advance command was received after power turn on, system reset, or operator initialization of VFB, and no load-vertical-format-buffer command was issued.
7	Load code request/ parity error	This sense bit is set if one of the following conditions is present: 1. A parity error is detected when accessing the load code buffer. 2. A print-advance or diagnostic command was received after power turn on, system reset, or operator initialization of VFB, and no load-code-buffer command was issued.

SENSE DATA BYTE	BIT 0	1	2	3	4	5	6	7
0	COMMAND REJECT	INTERVENTION REQUIRED	BUS OUT CHECK	CARD JAM	DATA CHECK	OVERRUN	INHIBIT STATUS IN	NONREPEAT ABNORMAL
1	STOP	VALIDITY CHECK	RESYNC ERROR	COMPARE ERROR	COLUMN 0 ERROR	TRANSFER CHECK	SHORT CARD SELECTION	DUAL TRANSLATE
2	COLUMN COUNTER NORMALIZED	COUNTER BIT 1	COUNTER BIT 2	COUNTER BIT 3	COUNTER BIT 4	COUNTER BIT 5	COUNTER BIT 6	COUNTER BIT 7

Bit Position	Bit Designation	Definition
		Sense Data Byte 0
0	Command reject	Set when an unspecified command is issued. If an incorrect parity is detected during the transfer of the command code, this bit is suppressed. Neither the channel end (bit 4) or device end (bit 5) in the status byte is set for this condition.
1	Intervention required	Set to indicate an abnormal condition during the previous operation. The error, in all cases, is an error that requires manual intervention to correct (empty hopper, stacker full, misfeed, read jam, etc.).
2	Bus out check	Set when a command byte parity error is detected during the initial selection sequence. If the control unit is not holding a pending status, immediate termination results. Neither channel end nor device end status bits will be set. If the control unit is holding a pending status when the command byte parity error is detected, the command byte is disregarded; the stored status is transferred to the multiplexer channel during the status transfer sequence.
3	Card jam	Set to indicate a faulty card transport. If a card jam occurs at the ready station, or output station, the FEED CHECK indicator on the operator control panel lights and the card reader stops.
4	Data check	Set to indicate that a mispunched card, improper registration, or a read head failure is detected.

Bit Position	Bit Designation	Definition
		Sense Data Byte 0 (cont)
5	Overrun	Set to indicate that a new data byte is read before the channel acknowledges receipt of the previously transmitted data byte still stored in the control unit data register.
6	Inhibit status in	Set to indicate that the inhibit-status-in condition is set.
7	Nonrepeat abnormal	This bit is set to indicate that one of the following conditions was detected during the previous operation: ■ hopper empty ■ stacker full ■ interlock error ■ stacker jam
		Sense Data Byte 1
0	Stop	Set when the stop flip-flop is set.
1	Validity check	Set when a validity check error has been detected.
2	Resync error	Set if the reader does not detect a hole after the read strobe has been synchronized.

3	Compare error	Set if the data read in read station 1 does not compare to the data read in read station 2.
4	Column 0 error	Set if the read amplifiers are not all off at the leading edge of each card.
5	Transfer check	Set when a transfer check is detected.
6	Short card selection	Set when a 66- or 51-column read command is issued.
7	Dual translate	Set when bit 2 and bit 5 of a read command are 1 and 0, respectively.
	Sense Data Byte 2	
0	Column counter normalized	Set when the column counter has reached a count of 50 for 80-column cards, a count of 36 for 66-column cards, or a count of 21 for 51-column cards.
1	Counter bit 1	Set when the column counter bit 1 is set. Bit position 1 represents binary 1.
2	Counter bit 2	Set when the column counter bit 2 is set. Bit position 2 represents binary 2.
3	Counter bit 3	Set when the column counter bit 3 is set. Bit position 3 represents binary 4.
4	Counter bit 4	Set when the column counter bit 4 is set. Bit position 4 represents binary 8.
5	Counter bit 5	Set when the column counter bit 5 is set. Bit position 5 represents binary 16.
6	Counter bit 6	Set when the column counter bit 6 is set. Bit position 6 represents binary 32.
7	Counter bit 7	Set when the column counter bit 7 is set. Bit position 7 represents binary 64.

SENSE DATA BYTE	BIT 0	1	2	3	4	5	6	7
0	COMMAND REJECT	INTERVENTION REQUIRED	BUS OUT CHECK	EQUIPMENT CHECK	DATA CHECK	OVERRUN	STOP STATE	DEVICE CHECK
1	COLUMN 0 ERROR	VALIDITY CHECK ERROR	COMPARE ERROR	RESYNC ERROR	TRANSFER CHECK	N/A	51-COLUMN FEATURE	66-COLUMN FEATURE

Bit Position	Bit Designation	Definition
		Sense Data Byte 0
0	Command reject	Set to 1 if an invalid command is issued. Unit check status is set to 1 and card reader control does not go active.
1	Intervention required	Set to 1 if a condition is detected that requires manual intervention.
2	Bus out check	Not used and is set to 0 by the card reader control.
3	Equipment check	Set to 1 if a card transport error has occurred (card jam). The following conditions cause this error: 1. The read station photocells remain covered, indicating that a card has slowed or stopped in the read station. 2. A card covers the gate photocell and does not pass within the prescribed time count. The motors are turned off immediately and the stop state entered.

Bit Position	Bit Designation	Definition
		Sense Data Byte 0 (cont)
4	Data check	Set to 1 if any of the following conditions are detected: ■ column 0 error (SB1,0) ■ validity check error (SB1,1) ■ compare error (SB1,2) ■ resync error (SB1,3)
5	Overrun	Set to 1 if an overrun condition on data transfer is detected.
6	Stop state	Set to 1 if the card reader is in the stop state. The card reader may enter the stop state by way of the STOP switch or an error condition.
7	Device check	Set to 1 if the card reader detects an interlock active. If device check occurs during a command, the command is terminated immediately.
		Sense Data Byte 1
0	Column 0 error	Set to 1 if all 12 read amplifiers are not off midway between the leading edge of a card and column 1.

1	Validity check error	Set to 1 if the command specified translate and the card reader control detected multiple punches in rows 1 through 7 for any individual column.
2	Compare error	Set to 1 if for any given column the data read in read station 1 does not compare when read in station 2.
3	Resync error	Set to 1 if the card reader control does not detect a punch hole after the read strobe has been synchronized. A read strobe is performed on every column. A resync is performed only when the leading edge of a hole is detected. If a resync occurs, a check is made to verify if the hole still exists (properly centered). The error occurs when the hole does not register properly.
4	Transfer check	Set to 1 if a card is fed from the hopper and detected by the read station photocells or the card patch sensor when a feed was not issued by the card reader control. The motors are turned off immediately and the stop state entered. No status indication is presented to the IPC until the next SIO sequence to the card reader control.
5	N/A	Set to 0 by the card reader control.
6	51-column feature	Set to 1 if F1627—00 is installed; otherwise 0.
7	66-column feature	Set to 1 if F1627—01 is installed; otherwise 0.

SENSE DATA BYTE	BIT 0	1	2	3	4	5	6	7
1	COMMAND REJECT	INTERVENTION REQUIRED	BUS OUT CHECK	CARD JAM	DATA CHECK	DATA LATE	NONREPEAT ABNORMAL	INHIBIT STATUS IN
2	NOT USED	NOT USED	HCRPA	HCRPB	HCRPC	HCR2A	HCR2B	HCR2C

Bit Position	Bit Designation	Definition
		Sense Data Byte 1
0	Command reject	Set when an unspecified command is issued. If an incorrect parity is detected during the transfer of the command code, this bit is suppressed. Neither the channel end bit (4) nor device end bit (5) in the status byte is set for this condition.
1	Intervention required	Set to indicate that an abnormal condition (other than a hole count error) was detected during the previous operation. In all cases, the error requires manual intervention to correct (that is, empty hopper, stacker full, etc).
2	Bus out check	Set when a command byte or data byte parity error is detected during the initial selection sequence. A command byte parity error causes the control unit to terminate operation immediately and to suppress the invalid command. If the control unit is holding a pending status when the command byte parity error is detected, the command byte is disregarded and the stored status is transferred to the multiplexer channel during the status transfer sequence. Neither the channel end nor the device end bit in the status byte is set for this condition. A data byte parity error during data transfer causes the control unit to terminate operation immediately. Channel end bit and device end bit in the status byte are set.

Bit Position	Bit Designation	Definition
		Sense Data Byte 1 (cont)
3	Card jam	Set to indicate that a card transport error has occurred. A jam in the prepunch station causes the A JAM half of the MAN FEED A JAM/B JAM switch/indicator on the operator's control panel to light. A jam in the postpunch station causes the B JAM half of the MAN FEED A JAM/B JAM switch/indicator on the operator control panel to light.
4	Data check	Not used. This bit position contains a 0.
5	Data late	Set to indicate that the punch buffer has not been loaded prior to the initiation of a punch operation.
6	Nonrepeat abnormal	Set to indicate that one of the following conditions was detected during the previous operation: ■ hopper empty ■ chips (box full or not in place) ■ stacker jam ■ stacker full ■ interlock error

7	Inhibit		Set to indicate that the inhibit status bit in flip-flop is set (prevent a status byte from being sent to the multiplexer channel).
Sense Data Byte 2			
0	Not used		Sense data byte 2 is used for maintenance analysis functions in conjunction with failure routines. The status of various flip-flops in the control unit is transferred to this byte.
1	Not used		
2	HCRPA	Punch	
3	HCRPB	hole	
4	HCRPC	counter	
5	HCR2A	Post-read	
6	HCR2B	hole	
7	HCR2C	counter	

SENSE DATA BYTE	BIT 0	1	2	3	4	5	6	7
0	COMMAND REJECT	INTERVENTION REQUIRED	N/A	EQUIPMENT CHECK	DATA CHECK	OVERRUN	STOP STATE	DEVICE CHECK
1	COLUMN 0 ERROR	VALIDITY CHECK ERROR	STROBE ERROR	MISFEED ERROR	PUNCH CHECK ERROR	N/A	READ STATION FEATURE	N/A

Bit Position	Bit Designation	Definition
		Sense Data Byte 0
0	Command reject	Set to 1 if an invalid command is issued. Unit check status is set and the control is not active.
1	Intervention required	Set to 1 if a condition is detected which requires manual intervention.
2	N/A	Not applicable. Set to 0 by the control.
3	Equipment check	Set to 1 if a card transport error has occurred. The following conditions can cause this error: ■ The advance wait station light sensor indicated a lit condition prior to feeding the card from the advance station to the punch station. ■ A card was fed through the read station, but the leading edge failed to be detected by the pre-punch sensor. ■ A card was pushed through the punch station, but the leading edge of the card failed to be detected by the post punch light sensor after the card was pushed 34 columns.

Bit Position	Bit Designation	Definition
		Sense Data Byte 0 (cont)
3	Equipment check (cont)	■ The eject card rollers were activated to transport a card to the output stacker but the post punch light sensor did not switch from dark to light within 250 milliseconds. ■ A card is in the read station for more than 150 milliseconds or any read station sensor (if F1617—00 is installed) is dark at column 84. ■ A card was fed from the advance station through the punch station, but the prepunch sensor did not switch from dark to light after the fifth push on the card.
4	Data check	Set to 1 if any of the following conditions exists: ■ column 0 error (SB1, 0) ■ validity check error (SB1,1) ■ strobe error (SB1,2) ■ punch check error (SB1,4)
5	Overrun	Set to 1 if an overrun condition on punch or read data transfers is detected. Data transfers for the current operation are terminated.

6	Stop state	Set to 1 if the subsystem is in the stop state. The subsystem may enter this state via the STOP switch, or an error condition.
7	Device check	Set to 1 if the subsystem has detected interlock active. If device check occurs during a command, the command is immediately terminated.
Sense Data Byte 1		
0	Column 0 error	Set to 1 if the read station is installed, and any 1 of the 12 read stations detect a hole between the leading edge of a card and column 1.
1	Validity check error	Set to 1 while operating in the translate mode and more than one punch per column was detected in rows 1 through 7.
2	Strobe error	Set to 1 if the read station feature is installed and a stroke signal detected incorrect data.
3	Misfeed error	Set to 1 if a card failed to feed from the card reader hopper.
4	Punch check error	Set to 1 if a mismatch occurs during the punch cycle, when the punch check performs an accuracy check.
5	N/A	Not applicable. Set to 0 by the control.
6	Read station feature	Set to 1 if read station feature is installed; otherwise set to 0 by the control.
7	N/A	Not applicable. Set to 0 by the control.

SENSE DATA BYTE	BIT 0	1	2	3	4	5	6	7
0	COMMAND REJECT	INTERVENTION REQUIRED	BUS OUT CHECK	EQUIPMENT CHECK	DATA CHECK	OVERRUN	TRACK CONDITION CHECK	SEEK CHECK
1	COUNT AREA CHECK	TRACK OVERRUN	CYLINDER END	INVALID SEQUENCE	NO RECORD FOUND	FILE PROTECTED	MISSING ADDRESS MARKER	OVERFLOW INCOMPLETE
2	UNSAFE	NOT USED (ALWAYS 0)	NOT USED (ALWAYS 0)	NOT USED (ALWAYS 0)	NOT USED (ALWAYS 0)	UNSELECTED STATUS	NOT USED (ALWAYS 0)	NOT USED (ALWAYS 0)
3	READY	ONLINE	UNSAFE	NOT USED (ALWAYS 0)	NOT USED (ALWAYS 1)	END OF CYLINDER	NOT USED (ALWAYS 0)	SEEK INCOMPLETE
4	ALWAYS 0							
5	THIS BYTE IS ALL 0's EXCEPT WHEN BIT 7 OF BYTE 1 IS SET (OVERFLOW INCOMPLETE).							

Bit Position	Bit Designation	Definition
		Sense Data Byte 0
0	Command reject	This bit is set: ■ when an invalid command, an invalid sequence of commands, or a command for a feature not installed is received; ■ when the command received is one restricted by set-file-mask; ■ when two set-file-mask commands are sent in the same command chain; ■ when a second disc drive unit is addressed during a command chain.
1	Intervention required	This bit is set when a nonexistent (either physically or electrically) disc drive unit is addressed.
2	Bus out check	This bit is set when a command or data arrives on the bus out lines with even (incorrect) parity. If the bus out check bit is set, the command reject bit is not set for an invalid command.
3	Equipment check	This bit is set to indicate an equipment fault within the subsystem and is set with bit 0 of sense data byte 2.
4	Data check	This bit is set when an error is detected in the information transferred from a disc drive to the control unit.

Bit Position	Bit Designation	Definition
		Sense Data Byte 0 (cont)
5	Overrun	This bit is set: ■ when the control unit does not receive data bytes within the prescribed time; ■ when data is received too late to be properly written and the remaining record area is filled with 0's; ■ when a subsequent command in a chain is received too late to be properly executed.
6	Track condition check	This bit is set when a read, write, or search command is attempted on a defective track (bit 6 of the flag byte on the record is set if the track is defective). These commands are inhibited for all data records but are permitted for home address and track descriptor records.
7	Seek check	This bit is set when an invalid address is sent for a seek command or if less than six address bytes are sent.
		Sense Data Byte 1
0	Count area check	This bit is set as the result of an error in the count area transferred from a disc drive to the control unit.

1	Track overrun	This bit is set when the writing on a track is not completed by the time the index marker is reached.
2	Cylinder end	This bit is set when a command chain is not completed by the time the end of a cylinder is reached.
3	Invalid sequence	This bit is set when two set-file-mask commands are sent in the same command chain. This bit, which is set along with bit 0 (command reject) of sense data byte 0, is also set for an invalid sequence of commands.
4	No record found	This bit can be set only when the M bit of read and search commands is 0 and one of the following conditions exists: Two index markers are detected, and there are no intervening read or write commands during the execution of a chain of search commands. ■ A read or search command has been issued for a blank track. ■ A home address and address marker are missing from a record R_0 track.
5	File protected	This bit is set when a seek or write command which has been prohibited by a set-file-mask command is issued.
6	Missing address marker	This bit is set along with bit 4 (data check) of sense data byte 0 when one of the following conditions exists: ■ Two index markers are passed without detecting any address markers.

Bit Position	Bit Designation	Definition
		Sense Data Byte 1 (cont)
6	Missing address marker (cont)	■ Two successive records are read in which the bit 0's of the flag bytes are equal (indicating that both records are odd or even), and there was no intervening index marker; thus an address marker was missed. An exception is when the command issued is a search-ID, and the error indication would be no record found.
7	Overflow incomplete	This bit is set when an overflow record is not completed because overflow came either from a defective track or from an alternate track. Bit 6 (defective track check) of sense data byte 0 also is set for these conditions.
		Sense Data Byte 2
0	Unsafe	This bit is set when a disc file malfunction is detected.
1	N/A	This bit is not used and is always 0.
2	N/A	This bit is not used and is always 0.
3	N/A	This bit is not used and is always 0.
4	N/A	This bit is not used and is always 0.
5	Unselected status	This bit is set when a file status line is active with no device selected.

6, 7	N/A	These bits are not used and are always 0.
Sense Data Byte 3		
0	Ready	This bit is set when the disc file is ready for operation.
1	Online	This bit is set when the disc file is online.
2	Unsafe	This bit is set when a disc file malfunction is detected.
3	N/A	This bit is not used and is always 0.
4	N/A	This bit is not used and is always 1.
5	End of cylinder	This bit is set along with bit 7 of sense data byte 1 when a seek command is not successfully completed.
6	N/A	This bit is not used and is always 0.
7	Seek incomplete	This bit is set when the end of a cylinder is detected.
Sense Data Byte 4		
0–8		The bits of sense data byte 4 are always 0.

Bit Position	Bit Designation	Definition
		Sense Data Byte 5

This byte contains all 0's at all times except when the overflow incomplete bit is set (byte 1, bit 7). The codes in byte 5 indicate the type of command being executed when an overflow incomplete occurs. The codes and their meanings are:

Code In Hexadecimal	Meaning
06	A read command is in progress.
05	A write command is in progress.
25	A search-key-and-data-equal command is in progress, and the comparison is equal to this point.
45	A search-key-and-data-high command is in progress, and the comparison is equal to this point.
65	A search-key-and-data-equal-or-high command is in progress, and the comparison is equal up to this point.
55	Any search-key-and-data operation is in progress, and the comparison is low; or a search-key-and-data-equal is in progress, and the comparison is high.
75	A search-key-and-data-high command or a search-key-and-data-equal-or-high command is in progress, and the comparison is high.

SENSE DATA BYTE	BIT 0	1	2	3	4	5	6	7
0	COMMAND REJECT	INTERVENTION REQUIRED	OUTPUT PARITY CHECK	EQUIPMENT CHECK	DATA CHECK	OVERRUN	STOP STATE	DEVICE CHECK
1	ID FIELD CHECK	TRACK OVERRUN	CYLINDER END	—	NO RECORD FOUND	FILE PROTECT	SYNC REGION ERROR	DATA FIELD CHECK
2	SEEK INCOMPLETE	COMPARISON PARITY CHECK	HEAD/CYLINDER MISCOMPARE	RECORD NUMBER MISCOMPARE	FLAGE BYTE MISCOMPARE	UNSELECTED STATUS	ECC CHECK	NÓ CLOCKS
3	ALWAYS 0	ALWAYS 0	ALWAYS 0	ALWAYS 0	HEAD ADDRESS			
4	ALWAYS 0	ALWAYS 0	RECORD NUMBER					

Bit Position	Bit Designation	Definition
		Sense Data Byte 0
0	Command reject	When set alone this indicates an invalid command code, an invalid head address, or an attempted write command when programmed offset was selected in the BCW. (Bit 125 is set to 1.) It may also be set with file protect (SB1,5) to indicate that a write command was issued to a file protected device.
1	Intervention required	Sets with stop state (SB0,6) to indicate that an operation was attempted on a device which was either nonexistent or in the stop state.
2	Output parity check	Indicates that a parity error was detected at the end of the output queue (i.e., the input to the shifter).
3	Equipment check	This bit is set to indicate that a serious hardware malfunction has occurred within the subsystem. If set alone, it indicates that the adapter control logic contains an error. If set with ECC check (SB2,6) it indicates a malfunction in the ECC logic during a write or format-write-command. It may also set with device check (SB0,7) to indicate that the device selected has a serious hardware failure (see device check listed separately), with seek incomplete (SB2,0) to indicate that a selected device was not able to complete a seek within a specified period of time, or with unselected status (SB2,5) to indicate that status has been received from a device not selected. It may also set with track overrun (SB1,1) to indicate that index occurred while a record was being processed implying that the dsic is rotating too fast relative write oscillator.

Bit Position	Bit Designation	Definition
		Sense Data Byte 0 (cont)
4	Data check	Set with no-clocks (SB2,7) to indicate that no clocks have occurred for 10 ms while reading or writing, or with comparison parity check (SB2,1) to indicate a parity bit miscompare was detected at the comparator. It will also set with head/cylinder miscompare (SB2,2), with record number miscompare (SB2,3) or flag byte miscompare (SB2,4) to signify difficulty with a seek operation, difficulty in maintaining orientation in the read circuitry, or an incorrect flag byte, respectively, and no ECC check error was detected. Data check will also set with ID field check (SB1,0) or data field check (SB1,7) together with either sync region error (SB1,6) or ECC check (SB2,6). These bit combinations will indicate either that an error (such as an improperly detected index mark or an incorrect sync byte) has been detected in the sync region, or that an ECC check error was detected. They will also indicate whether the error was detected in an ID field or a data field.
5	Overrun	Indicates during a write or search operation that main storage has not supplied data at a sufficient rate to satisfy the data rate of the device. Sets when the output queue is empty and a request is made of the queue for more data. It also sets during a read operation if main storage accepts information too slowly. Overrun sets when the input data register is full and the shifter is ready to transfer a full byte to it.

6	Stop state	Sets with intervention required (SB0,1) if an operation was attempted on a device nonexistent or in the stop state. It will be set alone if the device addressed by the sense command is nonexistent or in the stop state, but no operation was attempted on the device.
7	Device check	Sets with equipment check (SB0,3) to indicate that the device selected has a serious hardware error requiring maintenance and/or operator intervention. If conditions in the device prevail that cause device check to set when the device is not selected, device check may be presented alone; this occurs only if no attempt has been made to use that device. Some examples of errors that may cause this are: multiple head selection, write current on without having been selected, etc. Note that device check can be set if a seek (implied or seek command) is issued to a nonexistent cylinder (>410 for 8416).
Sense Data Byte 1		
0	ID field check	Sets with data check (SB0,4) and either sync region error (SB1,6) or an ECC check (SB2,6) to indicate either that an error was encountered in the ID field preamble or in the ID field ECC bytes, respectively.
1	Track overrun	Sets with equipment check (SB0,3) to indicate that index was encountered while processing a record.
2	Cylinder end	Indicates an operation was incomplete at the end of a cylinder.
3	N/A	Set to zero by the IDA.

Bit Position	Bit Designation	Definition
		Sense Data Byte 1 (cont)
4	No record found	Sets alone, during a search/read command to indicate that the search conditions were not satisfied after two passes of index if the multitrack bit is not set in the buffer control word. If the multitrack bit is set, it will be set in conjunction with cylinder end (SB1,2) if the search conditions were not satisfied by the end of the cylinder. No-record-found will also set in conjunction with sync region error (SB1,6) if no data was found on the selected track (i.e., two passes of index occurred without an intervening ID preamble.) It also sets alone on read-data or write-data commands if the record number specified in the BCW cannot be found.
5	File protect	Sets if the device selected is in file protect mode. Command reject (SB0,0) will also be set if a write operation were attempted on the device.
6	Sync region error	Sets with data check (SB0,4) and either ID field check (SB1,0) or data field check (SB1,7) to indicate that an error was detected in the preamble of either the ID field or the data field of a record, respectively.
7	Data field check	Sets with data check (SB0,4) and either sync region error (SB1,6) or ECC check (SB2,6) to indicate either that an error was encountered in the data field preamble or in the data field ECC bytes, respectively.

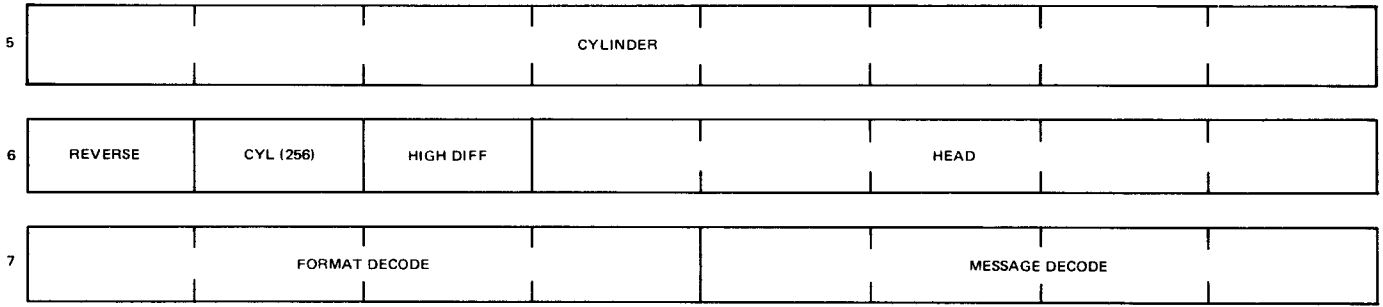
Sense Data Byte 2		
0	Seek incomplete	Sets with equipment check (SB0,3) to indicate that a seek operation could not be completed within a specified time, or that the positioner on a drive drifted off track while the drive was selected, but no head had yet been selected. Seek incomplete can only be cleared by issuing a recalibrate command to the drive that caused the error.
1	Comparison parity check	Indicates parity bits associated with bytes found to be identical by the comparator, are not identical.
2	Head/cylinder miscompare	Sets with data check (SB0,4) to indicate that the head and/or cylinder number specified in the BCW does not match the corresponding bytes on a record read from the disc, and no ECC check error occurred.
3	Record number miscompare	Sets with data check (SB0,4) to indicate that the record number read from the disc is not the one expected after a string of records has begun to be processed. This bit implies that one or more records has accidentally been skipped.
4	Flag byte miscompare	Indicates that the flag bits read from the disc did not match those in the BCW. Data check (SB0,4) is also set when this bit is set.
5	Unselected status	Sets with equipment check (SB0,3) to indicate that a device has raised a status line when no device was selected.
6	ECC check	Sets with data check (SB0,4) and either ID field check (SB1,0) or data field check (SB1,7) to indicate that an ECC error was detected in either the ID field or the data field, respectively. It may also set with equipment check (SB0,3) to indicate an ECC malfunction during a write-or-format-write command.
7	No clocks	Sets with data check (SB0,4) to indicate that no clocks have occurred within 10 ms (±30%) while reading or writing.

Bit Position	Bit Designation	Definition
		Sense Data Byte 3
0–3	N/A	Set to zero by the IDA.
4–7	Head address	Indicates which head was last selected.
		Sense Data Byte 4
0–1	N/A	Set to zero by the IDA.
2–7	Record number	Indicates the last record number partially or completely processed at the time of termination of the operation.

Summary of Sense Bits Possible for Each Command

Commands	Byte 0								Byte 1								Byte 2							
Sense Bits	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7
	Command Reject	Intervention Required	Output Parity Check	Equipment Check	Data Check	Overrun	Stop Store	Device Check	ID Field Check	Track Overrun	Cylinder End	—	No Record Found	File Protect	Sync Region Error	Data Field Check	Seek Incomplete	Comparison Parity Check	Head/Cyl Miscompare	Record No. Miscompare	Flag Byte Miscompare	Unselected Status	ECC Check	No Clocks
Format Write	X	X	X	X			X	X		X				X			X					X		X
Write Data	X	X	X	X	X	X	X	X	X	X	X		X	X	X		X	X	X	X	X	X	X	X
Read Data	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
Search/Read	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
Read ID	X	X	X	X	X	X	X	X	X	X			X	X	X		X	X				X		X
Seek	X	X		X			X	X						X			X					X		

SENSE DATA BYTE	BIT 0	1	2	3	4	5	6	7
0	COMMAND REJECT	INTERVENTION REQUIRED	BUS OUT PARITY	EQUIPMENT CHECK	DATA CHECK	OVERRUN	ALWAYS 0	ALWAYS 0
1	PERMANENT ERROR	INVALID TRACK FORMAT	END OF CYLINDER	ALWAYS 0	NO RECORD FOUND	FILE PROTECT	WRITE INHIBITED	OPERATION INCOMPLETE
2	ALWAYS 0	CORRECTABLE	ALWAYS 0	ENVIRONMENTAL DATA PRESENT	ALWAYS 0	ALWAYS 0	ALWAYS 0	ALWAYS 0
3	RESTART COMMAND							
4	PHYSICAL ID							


5
CYLINDER
6
REVERSE
CYL (256)
HIGH DIFF
HEAD
7
FORMAT DECODE
MESSAGE DECODE

SENSE BYTE NO.

	0	1	2	3	4	5	6		7
							8405/8430	8433	
BIT 0	COMMAND REJECT	PERMANENT ERROR	0	RESTART COMMAND	PHYSICAL ID	CYLINDER	REVERSE	0	FORMAT DECODE BITS 0 3
BIT 1	INTERVENTION REQUIRED	INVALID TRACK FORMAT	CORRECTABLE				CYL (256)	CYL (512)	
BIT 2	BUS OUT PARITY	END OF CYLINDER	0				HIGH DIFF	CYL (256)	DECODES 7 E NOT USED F INLINE SENSE DATA
BIT 3	EQUIPMENT CHECK	0	ENVIRONMENTAL DATA PRESENT				HEAD		
BIT 4	DATA CHECK	NO RECORD FOUND	0						MESSAGE DECODE BITS 4 7
BIT 5	OVERRUN	FILE PROTECTED	0						
BIT 6	0	WRITE INHIBITED	0						
BIT 7	0	OPERATION INCOMPLETE	0						

NOTE:

BYTES 0 THRU 6 ARE THE SAME FOR ALL FORMATS.

MESSAGE DECODE	FORMAT 0 MESSAGE ONLY	FORMAT 1 DEVICE ERRORS	FORMAT 2 C.U. ERRORS	FORMAT 3 SELECTIVE RESET	FORMAT 4 ECC UNCORRECTABLE	FORMAT 5 ECC CORRECTABLE	FORMAT 6 USAGE/ERROR COUNT	FORMAT F INLINE SENSE DATA
0	NO MESSAGE	NO MESSAGE	NO MESSAGE	NO MESSAGE	HA FIELD ECC UNCORRECTABLE	HA FIELD CORRECTABLE		
1	INVALID COMMAND	SET SECTOR ERROR	ECC P1 OR P3 COMPARE ERROR		COUNT FIELD ECC UNCORRECTABLE	COUNT FIELD CORRECTABLE		
2	INVALID SEQUENCE	ABNORMAL INTERRUPT FROM DRIVE	ECC P2 COMPARE ERROR		KEY FIELD ECC UNCORRECTABLE	KEY FIELD CORRECTABLE		

3	CCW COUNT LESS THAN REQUIRED	NO WRITE GATE AT DRIVE	UNUSED	UNUSED	DATA FIELD ECC UNCORRECTABLE	DATA FIELD CORRECTABLE	UNUSED	UNUSED
4	DATA VALUE NOT AS REQUIRED	NO WRITE CURRENT SENSE			HA FIELD NO SYNC BYTE FOUND	UNUSED		
5	UNUSED	UNUSED			COUNT FIELD NO SYNC BYTE FOUND			
6	CHANNEL DISCONTINUED RETRY OPERATION	SET CYLINDER ERROR			KEY FIELD NO SYNC BYTE FOUND			
7	CHANNEL RETURNED INCORRECT RETRY CCW	SET HEAD ERROR			DATA FIELD NO SYNC BYTE FOUND			
8	UNUSED	SET DIFFERENCE ERROR			UNUSED			
9	UNUSED	FILE STATUS NOT AS EXPECTED			AM DETECTION FAILURE ON RETRY			
A	UNUSED	SEEK ERROR			UNUSED		UNUSED	
B	IMPROPER ALTERNATE TRACK POINTER	SEEK INCOMPLETE ON RETRY						
C	SERDES MALFUNCTION, NO ST4'S	NO INTERRUPT FROM DRIVE						
D	UNUSED	UNUSED						
E	UNUSED							
F	RETRY BYTE SECTOR VALUE COUNTER/ INCORRECT							

FORMAT 1
DEVICE
ERRORS

	BYTE 8 FILE STATUS	BYTE 9	BYTE 10 CONDITION AT UNSAFE	BYTE 11 SERVO UNSAFE	BYTE 12 R/W UNSAFE	BYTE 13 FC REG	BYTE 14 FB REG	BYTE 15 FT REG	BYTE 16	BYTE 17	BYTE 18	BYTE 19	BYTE 20	BYTE 21 CUDI(IS REG)	BYTE 22	BYTE 23
P																
0	INDEX ERROR		LINEAR MODE		UNSAFE			MODULE SELECT GATE						DRIVE SELECTION ERROR		
1	OFFSET ACTIVE		FIRST CYLINDER & LINEAR MODE					TAG GATE						TAG NOT VALID AT DEVICE		
2	SEEK INCOMPLETE		ACCESS READY		R/W READY UNSAFE			ENABLE TAG VALID CHECK						DEVICE CHECK		
3	SEEK/FORMAT COMPLETE		ODD CYLINDER											FILE BUS OUT PARITY ERROR		
4	ON LINE		DRIVE TO INNER GUARD BAND=1 (NOT EVEN CYLINDER)=0	ANY UNSAFE EXCEPT R/W	HEADS UNSAFE			DECODE 8 BIT						FILE BUS IN PARITY ERROR		
5	PACK CHANGE		TO DRIVE FORWARD 20 (P5=1 (NOT DIFFERENCE)=0) =0	PACK SPEED UNSAFE	PLO UNSAFE			DECODE 4 BIT						TAG BUS OUT PARITY ERROR		
6	BUSY		DRIVE FORWARD SIZE=1 (NOT DIFFERENCE=0) =0	VELOCITY UNSAFE	DC WRITE UNSAFE			DECODE 2 BIT								
7	RECORD SEARCH IN PROGRESS		HEAD LOAD	30 VOLTS DC UNSAFE	AC WRITE UNSAFE			DECODE 1 BIT								
		ZERO				CONTENTS OF CUDI BUS OUT	CONTENTS OF CUDI BUS IN		ZERO	ZERO	ZERO	ZERO	ZERO		SECTOR DECREMENT	STAT INTEGRATOR

FORMAT 2
CONTROL
UNIT ERRORS

	BYTE 8 (CE REG) CONTROL CHECK	BYTE 9 SERDES (SE REG)	BYTE 10 ECC (EE REG)	BYTE 11	BYTE 12	BYTE 13 FC REG	BYTE 14 FB REG	BYTE 15 FT REG	BYTE 16	BYTE 17	BYTE 18	BYTE 19	BYTE 20	BYTE 21 CUDI(IS REG)	BYTE 22	BYTE 23
P																
0	CHANNEL BUS IN PARITY ERROR A/B	CUDI UNSAFE	NO. 1'S FROM SERDES SINCE LAST ECC RESET					MODULE SELECT GATE						DRIVE SELECTION ERROR		
1	CHANNEL A INTERFACE CHECK	SERDES WRITE PARITY CHECK	P0 OR WRITE ERROR					TAG GATE						TAG NOT VALID AT DEVICE		
2	CHANNEL B INTERFACE CHECK	SERDES READ PARITY CHECK	P1 OR P3 ERROR					ENABLE TAG VALID CHECK						DEVICE CHECK		
3	DATA TRANSFER CHECK	BIT RING	P2 ERROR											FILE BUS OUT PARITY ERROR		
4	SERDES, CUDI, ECC CHECK		P1 ERROR					DECODE 8 BIT						FILE BUS IN PARITY ERROR		
5	CHANNEL C INTERFACE CHECK	ECC ERROR	P3 ERROR					DECODE 4 BIT						TAG BUS OUT PARITY ERROR		
6	CHANNEL D INTERFACE CHECK							DECODE 2 BIT								
7								DECODE 1 BIT								
				ZERO	ZERO	CONTENTS OF CUDI BUS OUT	CONTENTS OF CUDI BUS IN		ZERO	ZERO	ZERO	ZERO	ZERO		SECTOR DECREMENT	STAT INTEGRATOR

FORMAT 3
SELECTIVE
RESET

	BYTE 8 FAILING ADDRESS (AD REG)	BYTE 9	BYTE 10 C U ERROR 1 (ET REG)	BYTE 11	BYTE 12	BYTE 13 IG REG	BYTE 14 IF REG	BYTE 15	BYTE 16	BYTE 17	BYTE 18	BYTE 19	BYTE 20	BYTE 21	BYTE 22	BYTE 23
P				ZERO	ZERO			ZERO	ZERO	ZERO	ZERO	ZERO	ZERO	ZERO	ZERO	ZERO
0		MEMORY ADDRESS BIT 5	MICRO PROGRAM FORCED ERROR FLAG			WRITE LATCH	LONG SELECT									
1	MEMORY ADDRESS PARITY	MEMORY ADDRESS BIT 6	CLOCK ERROR			READ LATCH	FREEZE DATA TRANSFER									
2		MEMORY ADDRESS BIT 7	PC, CONTROL FIELD PARITY ERROR			LAST BYTE REQUEST	DATA SEPARATOR ENABLE									
3	MEMORY ADDRESS BIT 0	MEMORY ADDRESS BIT 8	PA, MEMORY ADDRESS PARITY ERROR			OPERATIONAL IN										
4	MEMORY ADDRESS BIT 1	MEMORY ADDRESS BIT 9	A–BUS PARITY ERROR			ADDRESS IN	BLOCK SWITCH TO CHANNEL A									
5	MEMORY ADDRESS BIT 2	MEMORY ADDRESS BIT 10	B–BUS PARITY ERROR			STATUS IN	BLOCK SWITCH TO CHANNEL B									
6	MEMORY ADDRESS BIT 3	MEMORY ADDRESS BIT 11	ALU COMPARE ERROR				BLOCK SWITCH TO CHANNEL C									
7	MEMORY ADDRESS BIT 4	MEMORY ADDRESS BIT 12	PN, CONTROL MEMORY ADDRESS PARITY ERROR				BLOCK SWITCH TO CHANNEL D									

FORMAT 4
ECC
UNCORRECTABLE

	BYTE 8	BYTE 9	BYTE 10	BYTE 11	BYTE 12	BYTE 13	BYTE 14	BYTE 15	BYTE 16	BYTE 17	BYTE 18	BYTE 19	BYTE 20	BYTE 21	BYTE 22	BYTE 23
	CYLINDER		HEAD		RECORD	SECTOR	ACCESS OFFSET	RETRY COUNT	SOURCE PHYSICAL ADDRESS							
P									READ FROM ID BYTE WRITTEN BEFORE							
0									EACH RECORD, IDENTIFIES CU AND							
1								NUMBER OF	DRIVE THAT WROTE THE RECORD.							
2	HIGH ORDER BYTE	LOW ORDER BYTE	HIGH ORDER BYTE	LOW ORDER BYTE	RECORD NUMBER OF RECORD IN ERROR	SECTOR NUMBER OF START OF RECORD IN ERROR	800 µINCHES	RETRYS REQUIRED TO RECOVER FROM THE ERROR	BITS 0–1 CODE FOR CU BITS 2–7 DRIVE 3 FO 6 CODE A= 111000 E= 011100 B= 110001 F= 010101 C= 101010 G= 001110 D= 100011 H= 000111	ZERO	ZERO	ZERO	ZERO	ZERO	ZERO	ZERO
3							400 µINCHES									
4							200 µINCHES									
5							100 µINCHES									
6							50 µINCHES									
7	(LAST SEEK ADDRESS)		(LAST SEEK ADDRESS)				25 µINCHES									

FORMAT 5
ECC
CORRECTABLE

P	BYTE 8	BYTE 9	BYTE 10	BYTE 11	BYTE 12	BYTE 13	BYTE 14	BYTE 15	BYTE 16	BYTE 17	BYTE 18	BYTE 19	BYTE 20	BYTE 21	BYTE 22	BYTE 23
	CYLINDER		HEAD		RECORD	SECTOR	ACCESS OFFSET	RESTART DISPLACEMENT			ERROR DISPLACEMENT			PATTERN		CHANNEL TRUNCATION
0																
1																
2																
3							800 μINCHES									
4							400 μINCHES									
5							200 μINCHES									
6							100 μINCHES									
7							50 μINCHES									
	HIGH ORDER BYTE	LOW ORDER BYTE	HIGH ORDER BYTE	LOW ORDER BYTE	RECORD NUMBER OF RECORD IN ERROR	SECTOR NUMBER OF START OF RECORD IN ERROR	25 μINCHES	HIGH ORDER		LOW ORDER	HIGH ORDER	LOW ORDER	HIGH ORDER		LOW ORDER	0 – 6 UNUSED
	(LAST SEEK ADDRESS)		(LAST SEEK ADDRESS)					COUNT OF TOTAL NUMBER OF BYTES READ IN RECORD. CAN INCLUDE OVERFLOW SEGMENTS.			COUNT OF NUMBER OF BYTES FROM FIRST ECC BYTE TO START OF DATA IN ERROR		ECC GENERATED PATTERN TO CORRECT DATA IN ERROR. INCLUDES ALL THREE BYTES.			TRUNCATED

FORMAT 6
USAGE/ERROR
COUNT

P	BYTE 8	BYTE 9	BYTE 10	BYTE 11	BYTE 12	BYTE 13	BYTE 14	BYTE 15	BYTE 16	BYTE 17	BYTE 18	BYTE 19	BYTE 20	BYTE 21	BYTE 22	BYTE 23
	BYTES READ				CORRECTABLE DATA CHECKS		UNCORRECTABLE DATA CHECKS		SEEKS			SEEK ERRORS				
0	HIGH ORDER			LOW ORDER	HIGH ORDER	LOW ORDER	HIGH ORDER	LOW ORDER	HIGH ORDER	LOW ORDER	CHANNEL INDICATOR FOR BYTES 20–23. IF BIT 0 = 0, BYTES 20–23 REFER TO CHANNELS A AND B. IF BIT 0 = 1, BYTES 20–23 REFER TO CHANNELS C AND D.	NUMBER OF SEEK CHECKS UNDER THIS LOGICAL ADDRESS	NUMBER OF CHANNEL A OR C COMMAND OVERRUNS	NUMBER OF CHANNEL A OR C DATA OVERRUNS	NUMBER OF CHANNEL B OR D COMMAND OVERRUNS	NUMBER OF CHANNEL B OR D DATA OVERRUNS
1																
2																
3																
4	TOTAL NUMBER OF BYTES READ UNDER THIS LOGICAL ADDRESS				NUMBER OF ECC CORRECTABLE DATA CHECKS UNDER THIS LOGICAL ADDRESS		NUMBER OF ECC UNCORRECTABLE DATA CHECKS UNDER THIS LOGICAL ADDRESS		NUMBER OF SEEKS UNDER THIS LOGICAL ADDRESS							
5																
6																
7																

FORMAT 7
COMMAND
RETRY

	BYTE 8	BYTE 9	BYTE 10 GL REG	BYTE 11	BYTE 12	BYTE 13	BYTE 14	BYTE 15	BYTE 16	BYTE 17	BYTE 18 XM REG	BYTE 19 XN REG	BYTE 20	BYTE 21	BYTE 22	BYTE 23
P																
0																
1					RECORD		HIGH	LOW		RETRY						
2					NUMBER	KEY	ORDER	ORDER	SECTOR	COUNT						
3					OF RECORD	LENGTH	DATA	DATA	(INTERNAL)	(FOR NEXT						
4					IN ERROR		LENGTH	LENGTH		ATTEMPT)						
5																
6																
7																

FORMAT F
INLINE
SENSE DATA

	BYTE 8 FILE STATUS 1	BYTE 9 STATUS 2	BYTE 10 SERVO STATUS	BYTE 11 SERVO UNSAFE	BYTE 12 R/W UNSAFE	BYTE 13 FC REG	BYTE 14 FB REG	BYTE 15 FT REG	BYTE 16 CAR	BYTE 17 HAR	BYTE 18 DIFF	BYTE 19 SAR	BYTE 20	BYTE 21 CUDI(IS REG)	BYTE 22	BYTE 23
P																
0	INDEX ERROR	INDEX ERROR	LINEAR MODE			CONTENTS OF CUDI BUS OUT	CONTENTS OF CUDI BUS IN	MODULE SELECT GATE	NOTE: In the SEEK INCOMPLETE case, CAR, HAR, & DIFF are the values loaded prior to the seek. Bytes 5 & 6 are the seek address prior to the seeking. In the SEEK COMPLETE case, bytes 5 & 6 are the same as bytes 10 & 11				CORRECT REGISTER CONTENTS OR SECTOR UNDER TEST (BYTE 16, 17, 18, OR 19)	DRIVE SELECTION ERROR	ZERO	ZERO
1	OFFSET ACTIVE	OFFSET ACTIVE	FIRST CYLINDER & LINEAR MODE					TAG GATE						TAG NOT VALID AT DEVICE		
2	SEEK INCOMPLETE		ACCESS READY		R/W READY UNSAFE			ENABLE TAG VALID CHECK						DEVICE CHECK		
3	SEEK/FORMAT COMPLETE	READ ONLY	ODD CYLINDER		BUS OUT INVALID									FILE BUS OUT PARITY ERROR		
4	ON LINE	R/W READY	DRIVE TO-DRIVE GUARD BAND=1 (NOT EVEN CYLINDER)=0	ANY UNSAFE EXCEPT R/W	HEADS UNSAFE			DECODE 8 BIT TAG						FILE BUS IN PARITY ERROR		
5	PACK CHANGE	INDEX	TO DRIVE FORWARD 20 TPS=1 (NOT DIFFERENCE = 11)=0	PACK SPEED UNSAFE	PLO UNSAFE			DECODE 4 BIT TAG						TAG BUS OUT PARITY ERROR		
6	BUSY	END OF CYL	DRIVE FORWARD 3 TPS=1 (NOT DIFFERENCE=01)=0	VELOCITY UNSAFE	DC WRITE UNSAFE			DECODE 2 BIT TAG								
7	RECORD SEARCH IN PROGRESS	WRITE CUR SENSE	HEAD LOAD	30 VOLTS DC UNSAFE	AC WRITE UNSAFE			DECODE 1 BIT TAG								

Bit Position	Bit Designation	Definition
		Sense Data Byte 0
0	Command reject	Command reject generates a format 0 message which details the invalidity of the command. There is no error recovery as this is a programming condition. Command reject may appear with: ■ write inhibited (byte 1, bit 6). The drive READ ONLY switch is active. ■ file protect (byte 1, bit 5). The write operation attempted is prohibited by the file mask.
1	Intervention required	The drive is either logically or electrically offline. There is no error recovery (operational condition).
2	Bus out parity	A parity check occurred on a command or data byte from the channel. Retry one time.
3	Equipment check	Equipment check produces a format 0, 1, 2 or 3 sense which details the error. Equipment check with byte 1, bit 0 (permanent error) implies that the SCU has attempted recovery and failed. There is no further recovery. Equipment check without permanent error should be retried 10 times.

4	Data check	The processing of ECC bytes following a field indicated a data error. When posted with byte 1, bit 0 (permanent error) the data check is uncorrectable and byte 7 indicates the nature of the error. Permanent error is not set until the SCU has exhausted its error recovery procedures (27 retries at various offsets). There is no further recovery to be performed. When posted with byte 2, bit 1 (correctable) it indicates a correctable data error in a data field. Sense bytes 15 through 22 contain sufficient information to correct the error in main storage. There is one instance where data check can be posted on a write command. If an update write is performed on an overflow record in which the second or subsequent segment of the record has a data error in the home address or count field, data check and correctable are posted. The data error can be serviced in the normal manner (the error pattern is zero).
5	Overrun	The channel was late, in relation to the drive, to present a command or data byte or late in accepting a data byte. Overrun may appear with byte 1, bit 0 (permanent error) in which case, recovery attempts have been made by the SCU and there is nothing further to be done. Overrun without permanent error should be retried 10 times.
6		Always 0.
7		Always 0.

Bit Position	Bit Designation	Definition
		Sense Data Byte 1
0	Permanent error	Permanent error indicates the SCU internal error recovery facilities are exhausted and there is nothing further to be done. Permanent error is always a modifier bit for other error indications: ■ equipment check ■ data check ■ overrun
1	Invalid track format	A write command has been specified to write past index. There is no recovery as this is a programming error.
2	End of cylinder	End-of-cylinder indicates that a multitrack-read or search or an overflow-record operation has attempted head switching beyond the highest head address. End-of-cylinder is a programming condition. End-of-cylinder is presented for an attempted switch at head 11 for any cylinder.
3		Always 0.
4	No record found	No-record-found is posted after index has been encountered twice in the same chain without:

		■ a read of the home address or a data field ■ a control, write, or sense operation There is no recovery as this is a programming condition.
5	File protect	A seek-file-mask violation has been detected. A proscribed seek or implied seek (multitrack or overflow) has been attempted. When posted with command-reject, file-protect indicates a proscribed write operation has been attempted. There is no recovery for this error as it is a programming condition.
6	Write inhibited	This bit modifies command-reject and indicates a write was attempted on a drive where the READ ONLY switch is set. There is no recovery as this is an operational condition.
7	Operation incomplete	Operation-incomplete may occur alone or with: ■ data check ■ file protect ■ end-of-cylinder Operation-incomplete indicates that an overflow record operation terminated prematurely. If operation-incomplete occurred in conjunction with one of the above, the other condition should be serviced first and the operation-incomplete serviced just prior to restarting the command chain. Sense byte 3 contains the proper restart command code.

Bit Position	Bit Designation	Definition
Sense Data Byte 2		
0		Always 0.
1	Correctable	This bit is a modifier for data checks and indicates that data check is correctable.
2		Always 0.
3	Environmental data present	Indicates that usage or error count information is present in sense bytes 7—24.
4		Always 0.
5		Always 0.
6		Always 0.
7		Always 0.
Sense Data Byte 3		
Restart command		The restart command is valid only for operation-incomplete.

	Sense Data Byte 4
Physical ID	The physical drive ID is defined by an internal plug (not the external module plug) formatted: 0 | 0/1 | 3 of 6 code Bit 1 is the string number. Bits 2 through 7 indicate 1 of 8 physical drives. There is no association between the physical and logical device address.
	Sense Data Byte 5
Cylinder	Contains the low order cylinder (i.e., C_2 of $C_1C_2\ H_1\ H_2\ R$) currently addressed.
	Sense Data Byte 6
Head	Bit 0 = reverse Bit 1 = C_1; bit 7 Bit 2 = high order difference Bits 3–7 = head address Byte 6 completes the physical seek address where the access arm is positioned. Bytes 5 and 6 are useful for error recovery restart command chains.

Bit Position	Bit Designation	Definition

Sense Data Byte 7

Sense byte 7 indicates the format of the sense bytes 8—23 and indicates a message number indicating the error type. Bits 0—3 of byte 7 indicate the format:

Format	Description
0	Programming and SCU errors
1	Device checks
2	SCU checks
3	Selective reset
4	ECC uncorrectable data errors
5	ECC correctable data errors
6	Error and usage counts
7	Disconnected command retry
8—X'E'	Unused
X'F'	Inline sense

Bits 4—7 of byte 7 indicate a message number. The meaning of each message number varies by the format number.

SENSE DATA BYTE	BIT 0	1	2	3	4	5	6	7
1	INVALID COMMAND	INTERVENTION REQUIRED	BUS OUT CHECK	EQUIPMENT CHECK	DATA CHECK	NOT USED	INHIBIT STATUS IN SET	EOT READER OR LOW TAPE ON PUNCH
2	READER STOP FF SET	PUNCH STOP FF SET	FORMAT CONNECTOR OUT	NOT USED	PUNCH TAKE-UP REEL FULL	LOW PAPER SUPPLY ON PUNCH	BROKEN READ TAPE	NORMAL EOT ON READER

Bit Position	Bit Designation	Definition
		Sense Data Byte 1
0	Invalid command	Set when an unspecified command is issued. If an incorrect parity is detected during the transfer of the command code, this bit is suppressed. Neither the channel end bit (4) nor the device end bit (5) in the status byte is set for this condition.
1	Intervention required	Set to indicate that an abnormal condition was detected during the previous operation. In all cases, the error requires manual intervention to correct. One or more of the following conditions could exist: 1. program connectors not inserted properly on reader or punch; 2. punch supply reel not in operating condition; 3. punch take-up reel full; 4. broken tape on reader; 5. end of tape on reader; 6. low tape supply on punch; 7. reader in stop mode; or 8. punch in stop mode.

Bit Position	Bit Designation	Definition
		Sense Data Byte 0 (cont)
2	Bus out check	Set when a command byte or data byte parity error is detected during the initial selection sequence. A command byte parity error causes the control unit to terminate operation immediately and to suppress the invalid command. If the control unit is holding a pending status when the command byte parity error is detected, the command byte is disregarded and the stored status is transferred to the multiplexer channel during the status transfer sequence. Neither the channel end nor the device end bit in the status byte is set for this condition. A data byte parity error during data transfer causes the control unit to terminate operation immediately. The channel end bit and the device end bit in the status byte are set.
3	Equipment check	Set to indicate that a reader overshoot condition is detected (reader stopped, paper moved).
4	Data check	Set to indicate that a read parity error exists.
5		Not used.
6	Inhibit status in set	Set to indicate that the inhibit-status-in flip-flop is set and to prevent a status byte from being sent to the multiplexer channel.

7	EOT reader or low tape on punch	Set to indicate an end-of-tape condition on the reader or low tape supply on punch.
Sense Data Byte 2		
0	Reader stop FF set	The status of various flip-flops in the control unit is transferred to this byte, which is used to indicate that an abnormal condition was detected during the previous operation. In all cases, manual intervention is required to correct such abnormal conditions.
1	Punch stop FF set	
2	Program connector not inserted	
3	Not used	
4	Punch take-up reel full	
5	Low tape on punch	
6	Broken read tape	
7	Normal EOT on reader	

SENSE DATA BYTE	BIT 0	1	2	3	4	5	6	7
0	COMMAND REJECT	INTERVENTION REQUIRED	BUS OUT CHECK	EQUIPMENT CHECK	DATA CHECK	OVERRUN	INHIBIT STATUS	JAM
1	TRANSLATE	CARD READ	MARK READ	OCR CAMERA INHIBIT	MODULUS 10 CHECK DIGIT	STACKER MODE STACKER 2	STACKER MODE STACKER 3	DIAGNOSTIC MODE
2 (NOT MAINTENANCE MODE)	MULTIPLE READ	MODULUS 10 CHECK DIGIT ERROR	COLUMN 81 TEST	VALIDITY CHECK ERROR	MULTIPLE STROBE ERROR	MULTIPLE FEED	DOCUMENTS TOO CLOSE	BLANK DOCUMENT
2 (MAINTENANCE MODE)	DOCUMENT PRIMED	FEED FLIP-FLOP	FEED CELL1	FEED CELL 2	FEED CELL 3	FEED CELL 4	DOCUMENT PRESENCE	DIVERTER GATE
3	CHARACTER 0	CHARACTER 1	CHARACTER 2	CHARACTER 3	CHARACTER 4	CHARACTER 5	CHARACTER 6	CHARACTER 7
4	CHARACTER 8	CHARACTER 9	SYMBOL OR N	SYMBOL OR F	SYMBOL OR \	NOT USED	LVM	MULTIPLE

Bit Position	Bit Designation	Definition
		Sense Data Byte 0
0	Command reject	This bit is set when an invalid command is issued or a command requires an uninstalled feature. Neither the channel end or device end bit in the status bytes is set for this condition.
1	Intervention required	This bit is set when an abnormal condition was detected or if a command could not be executed. In all cases the ODR has gone out of the ready state, and manual intervention is required.
2	Bus out check	This bit is set for an invalid parity in command or data.
3	Equipment check	This bit is set when: ■ document spacing is incorrect; document is directed to stacker reject; ■ the time for issuing a stacker command has expired.
4	Data check	This bit is set to indicate that one of the following conditions was detected during the previous operation: ■ multiple read error feed ■ modulus 10 check digit error

Bit Position	Bit Designation	Definition
		Sense Data Byte 0 (cont)
4	Data check (cont)	■ validity check error ■ card reading error If the ODR is in stacker mode, these documents are directed to the reject stacker.
5	Overrun	This bit is set to indicate that at least one character is lost because the processor multiplexer channel did not service the ODR on time. If the ODR is in stacker mode, the document is directed to the reject stacker.
6	Inhibit status	This bit sets the inhibit status flip-flop.
7	Jam	This bit is set when a document jams.
		Sense Data Byte 1
0	Translate	This bit is set when data from the mark/card read station can be translated.*
1	Card read	This bit is set when the card read mode is selected.*
2	Mark read	This bit is set when the mark read mode is selected.*
3	OCR camera inhibit	This bit is set when the OCR mode is not selected.

4	Modulus 10 check digit	This bit is set when the modulus-10-check-digit mode is selected.*
5	Stacker mode, stacker 2	This bit is set when the ODR is in the stacker mode and stacker 2 is selected.
6	Stacker mode, stacker 3	This bit is set when the ODR is in the stacker mode and stacker 3 is selected.
7	Diagnostic mode	This bit is set to indicate that the ODR is in the diagnostic mode.
**This bit is usable only when the applicable feature has been installed.*		
Sense Data Byte 2 (Not Maintenance Mode)		
The following bits are set with the data check bit:		
0	Multiple read	This bit is set if more than one character was identified in a single character space. Example: A 3 was identified as an 8 as well as a 3; the multiple read bit is set, and the character is not accepted.
1	Modulus 10 check digit error	This bit is set when a modulus-10-check-digit error is detected.

Bit Position	Bit Designation	Definition
		Sense Data Byte 2 (Not Maintenance Mode) (cont)
2	Column 81 test	This bit is set when a mark is detected by the photocells in the margin of the card (column 81).
3	Validity check error	This bit is set when a validity check error is detected; more than one mark or punch per column on the document.
4	Multiple strobe error	This bit is set to indicate an error in reading the punched card.
The following bits are set with the equipment check bit:		
5	Multiple feed	This bit is set when more than one document is fed from the input hopper.
6	Documents too close	This bit is set when the spacing between documents is incorrect. The document is rejected.
The following bits are set with the unit check bit:		
7	Blank document	This bit is set when a blank document has been detected. The document is rejected.
		Sense Data Byte 2 (Maintenance Mode)
0	Document primed	These bits are set when the ODR is in the maintenance mode.
1	Feed flip-flop	

2	Feed cell 1	These bits are set when the ODR is in the maintenance mode.
3	Feed cell 2	
4	Feed cell 3	
5	Feed cell 4	
6	Document presence	
7	Diverter gate	
Sense Data Byte 3		
0	Character 0	Character 0 was recognized by the recognition logic.
1	Character 1	Character 1 was recognized by the recognition logic.
2	Character 2	Character 2 was recognized by the recognition logic.
3	Character 3	Character 3 was recognized by the recognition logic.
4	Character 4	Character 4 was recognized by the recognition logic.
5	Character 5	Character 5 was recognized by the recognition logic.
6	Character 6	Character 6 was recognized by the recognition logic.
7	Character 7	Character 7 was recognized by the recognition logic.

Bit Position	Bit Designation	Definition
		Sense Data Byte 4
0	Character 8	Character 8 was recognized by the recognition logic.
1	Character 9	Character 9 was recognized by the recognition logic.
2	Character ⅄ or N	Symbol ⅄ of the USASCOCR font selection or symbol N of the UNIVAC H–14 font selection was recognized by the recognition logic.
3	Symbol ⅂ or F	Symbol ⅂ of the USASCOCR font selection or symbol F of the UNIVAC H–14 font selection was recognized by the recognition logic.
4	Symbol ⅃ or \	Symbol ⅃ of the USASCSOCR font selection or symbol \ of the UNIVAC H–14 font selection was recognized by the recognition logic.
5		Not used. Bit always 0.
6	lvm	The long vertical mark of the UNIVAC H–14 or USASCSOCR font selections was recognized by the recognition logic.
7	Multiple	A multiple character was detected by the recognition logic.

SENSE DATA BYTE	BIT 0	1	2	3	4	5	6	7
0	COMMAND REJECT	INTERVENTION REQUIRED	BUS OUT CHECK	EQUIPMENT CHECK	DATA CHECK	OVERRUN	N/A	N/A
1	POWER OFF	COP NO RESPONSE	OPERATOR PRINT	WAIT ACTIVE	TRANSMIT ACTIVE	AUXILIARY INTERFACE FEATURE	PRINT TIME-OUT	N/A

Bit Position	Bit Designation	Definition
		Sense Data Byte 0
0	Command reject	Set to 1 if an invalid command is issued, or the wait-active (SB1,3) or operator-print (SB1,2) sense bits are set when a read or write command is issued. Also set if the transmit-active (SB1,4) sense bit is set when a write command is issued.
1	Intervention required	Set to 1 if the system console power is off (SB1,0); COP no response (SB1,1) or equipment check (SB,3) sense bit is set.
2	Bus out check	Set to 0 (not used).
3	Equipment check	Set to 1 if a fuse fault, print test, interlock, or out-of-paper condition is detected during a write command with the C modifier bit set. Also set if a print-time-out (SB1,6) is detected. Always 0 if the auxiliary interface feature is not installed.
4	Data check	Set to 1 if the b8 bit position of the ASCII code is set to 1.
5	Overrun	An early termination of a read command occurred or the WAIT switch was pressed during execution of a read or write command.
6	N/A	Set to 0 by the system console control.
7	N/A	Set to 0 by the system console control.

Bit Position	Bit Designation	Definition
		Sense Data Byte 1
0	Console power off	Set to 1 if the system console power has not sequenced up.
1	COP no response	Set to 1 if the auxiliary interface cannot perform print sequences because the COP is in a power-off state or is nonexistent. Always 0 if the auxiliary interface feature is not installed.
2	Operator print	Set to 1 if the auxiliary interface indicates a print sequence is in progress. Always 0 if the auxiliary interface feature is not installed.
3	Wait active	Set to 1 if the operator presses the WAIT switch, or power is turned on at the system console.
4	Transmit active	Set to 1 if the operator presses the TRANSMIT key or the text data contained a DC1 code.
5	Auxiliary interface feature	Set to 1 if the auxiliary interface feature is installed; otherwise always 0.
6	Print-time-out	Set to 1 if the 1-second interface timer expired during a print sequence.
7	N/A	Set to 0 by the system console control.