CALL DATA TRANSMITTER (CDT)
OPERATOR ANALYSIS OF CHANNEL TROUBLES
NO. 1A AUTOMATIC MESSAGE
ACCOUNTING RECORDING CENTER (AMARC)

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1. GENERAL

1.01 This section provides methods for analyzing call data transmitter (CDT) trouble messages as reported at the No. 1A AMARC (Generic 3 and higher) system input/output (I/O) terminal. These messages occur as a result of data link and CDT troubles.

1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

1.03 The No. 1A AMARC is a minicomputer installation with the primary objective of collecting and recording billing data from various switching entities. Billing data transmission is via data links between the No. 1A AMARC and the various switching entities.

1.04 Call data originates from the CDT and is provided in a modified triple-entry format to the No. 1A AMARC. The modified triple-entry

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information consists of an initial entry plus supervisory timing entries for each call. At the No. 1A AMARC, the billing information received from the CDT is synthesized, formatted, and recorded onto magnetic tape for processing at an accounting center.

1.05 Communication between the CDT and the No. 1A AMARC is via a 4-wire private line (primary link). There may be a maximum of two primary links per CDT controller. A dial backup link is provided for each controller in the event of a failure in a primary link. This backup facility is arranged for 2-wire operation only.

1.06 The primary indicating device for identifying troubles provided in this procedure is the I/O terminal of the No. 1A AMARC. The I/O terminal printout is used to identify and assist in correcting trouble conditions that may develop in the No. 1A AMARC/CDT operation.

1.07 Information is included in Part 5 for assisting in locating troubles in the No. 1A AMARC/CDT operation.

1.08 This section does not attempt to analyze troubles in detail which originate in the No. 1A AMARC. If it appears at any time that a problem exists within the No. 1A AMARC equipment, refer to Section 201-900-328 for clearing troubles.

2. NO. 1A AMARC/CDT OPERATION

2.01 All data transfers between remote terminals and the No. 1A AMARC are controlled by the No. 1A AMARC. Data is sent to the No. 1A AMARC as a response to a request for transmission. The CDT will not transmit a block of data until a complete poll message has been received from the No. 1A AMARC; likewise, the No. 1A AMARC will not transmit another poll message to the CDT until it has received and processed a complete block of data. Data is transmitted to and from remote terminals in serial form as 8-bit characters called bytes. Because asynchronous data links are used, each byte is preceded by one START (SPACE) bit and is followed by one STOP (MARK) bit. The No. 1A AMARC initiates a poll to the CDT with a 4-byte poll message. The sequence of bytes along with their octal representations are:

XXX START COMMAND

XXX BASIC COMMAND

XXX BASIC COMMAND COMPLEMENT

XXX START COMMAND COMPLEMENT

2.02 This 4-byte sequence, consisting of a COMMAND along with its complement, is used to guarantee the integrity of the message. The CDT will respond only to this 4-byte sequence with the commands and complements shown below. All other sequences will be ignored. Allowable commands are:

COMMAND	OCTAL VALUE	COMPLEMENT OCTAL VALUE	DEFINITION
Start	051	326	Get ready for transmission of data
Transmit (T)	242	135	Send a new block of data
Retransmit (RT)	304	073	Resend a previous block of data
Generate Tracer Statistics (GTS)	271	106	Requests a current statistical counts message

2.03 Table A provides a listing of messages that are applicable to transmission from the No. 1A AMARC to the CDT and from the CDT to the No. 1A AMARC.

2.04 The response of the CDT is monitored by the No. 1A AMARC to ensure that a response is received within an appropriate time interval and that the data block size is within proper limits. The various serial bits are received at the channel multiplexer and assembled into bytes. When a byte is assembled, it is transferred into a core memory input assembly table (IAT) dedicated to that channel. After loading the first two bytes into memory, a check is made to see if they constitute an end-of-block (EOB) sequence. If so, the next two bytes are assumed to be the cyclic redundancy check (CRC) character for the message. If EOB sequence is not indicated, additional bytes are loaded, checking after every second byte for an EOB sequence. When the EOB sequence and CRC bytes have been stored in the IAT, a check on the received data is performed by generating a separate CRC character based on the data stored in the IAT. If the computed CRC character matches the one received, there is no data link trouble. If there are any interface faults or call abnormalities, these will be detected and printed at this time.

2.05 Requests for data from the CDT are initiated by the No. 1A AMARC. The No. 1A AMARC sends a transmit command to the CDT and waits for a reply. The response from the CDT should not take longer than 2.2 seconds; otherwise, a remote location response (RLR) error exists. If the CDT has billing data to send, this data is now sent. Call records are sent in data blocks to the No. 1A AMARC. The billing data block structure is shown in Fig. 1. When there is no call data, the CDT sends a no data block to the No. 1A AMARC. The no data block structure is shown in Fig. 2.

2.06 The EOB sequence (Fig. 3) consists of two bytes that designate the end of the data block. The first byte is all zeros and the second byte contains an octal 36. This particular byte sequence cannot be legally produced by the CDT as part of a data message. Therefore, it is used as a flag to the No. 1A AMARC to indicate that all messages in a particular block have been received and that it should expect two more bytes and then begin to process the messages. The remaining two bytes are the CRC characters.

2.07 When the CRC characters of a received data block match those CRC characters recomputed by the No. 1A AMARC for that data block, the No. 1A AMARC processes the received data block and then sends another transmit command. If the CRC pairs do not match, the No. 1A AMARC sends a retransmit command for the previously requested data block. If the problem has not cleared in 9 seconds, the No. 1A AMARC will start the procedure to replace the primary data link with the backup link.

2.08 A switch from a primary link to the backup link may occur for the following conditions:

- Manual request from the No. 1A AMARC I/O terminal
- Automatic request due to data link error.

No. 1A AMARC working modes initiate actions that are necessary to establish communications over the backup link.

2.09 The following are possible error conditions for a primary link or backup link:

- CRC failure
- RLR time-out
- Block overflow
- Block time-out.

Switching From Primary to Backup Data Link

2.10 Once working modes have established the backup connection, the No. 1A AMARC transmits an initialization command over the backup link to the CDT. The CDT then performs a security handshake before establishing communication over the backup link. In the security handshake, the CDT verifies a password provided in the initialization command and then returns the TID message (Fig. 4) to the No. 1A AMARC. Upon completion of the security handshake, the No. 1A AMARC polls the CDT with a retransmit command. The CDT then retransmits the last unacknowledged data block or a no-data block previously sent over the failing primary channel.

2.11 If communication cannot be established on the dial backup link after four switchover

TABLE A

NO. 1A AMARC/CDT MESSAGES

NO. 1A AMARC TO CDT MESSAGES	CDT TO NO. 1A AMARC MESSAGES
Four-Character Command Messages: Start - Signals the CDT that the No. 1A AMARC is going to send a basic command (T, RT, or GTS). Transmit—A transmit (T) command requests the CDT to transmit a new block of billing data. The CDT responds by transmitting either a block of data or a no-data block reply message. Retransmit—A retransmit (RT) command requests a CDT to retransmit the last data block sent. The retransmit command is used when: Data received by the No. 1A AMARC fails an integrity check, or No. 1A AMARC detects a data link, error, or No. 1A AMARC detects an invalid, out-of-sequence, or nonresponsive message. Generate Tracer Statistics—The generate tracer statistics (GTS) command requests current statistical and status messages (SSM) records to be generated. This message provides the No. 1A AMARC intersystem integrity checks which are recorded into system tracer records. The SSM records are stored along with other billing data in the CDT buffer for transmission to No. 1A AMARC either immediately or in response to later T commands. CDT will immediately respond to the GTS command with a data or a no-data block. When the data for the SSM records are accumulated by the CDT, it will send the SSM records in response to subsequent T commands.	Terminal Identification—The terminal identification (TID) message is used by the CDT to identify itself to the No. 1A AMARC. This is used as a security "handshaking" procedure which is part of switching from the primary to the backup link or from the backup to the primary link. The 3-digit portion of the TID is the number assigned to that specific CDT office. Statistical and Status Information—The statistical and status message (SSM) is generated and later transmitted to the No. 1A AMARC after the GTS message is received and contains counts such as number of initial entries, number of attempts, number of calls abnormally terminated, and number of calls blocked or prevented from completing. This is sent as part of a data block. No Data—When the CDT receives a T command and has no new data, the no-data block is transmitted to the AMARC. The no-data block consists of two EOB characters followed by an all zero cyclic redundancy check (CRC). Billing Data Block—The billing data block (DBLK) will be transmitted in response to a GTS, T, or RT command. It is used for transmitting at least one billing report. All billing data blocks are made up of five basic parts with the data area containing two subparts: Block-type character DBLK (1 byte) Data Source Sequence Number (1 byte binary). Rotates through 000-177 octal for data source A, rotates through 200-377 octal for data source B. Data area containing billing data and a 2-byte block time stamp (maximum of 2 bytes)

TABLE A (Contd)

NO. 1A AMARC/CDT MESSAGES

NO. 1A AMARC TO CDT MESSAGES	CDT TO NO. 1A AMARC MESSAGES
Initialize—The initialize (INIT) command is used to start communication over a primary or backup channel. After receiving the INIT command, the CDT office responds with the TID message. If the TID does not match the number recorded in No. 1A AMARC NPD, an error message will be printed by No. 1A AMARC, but normal polling will continue. The INIT command contains dynamic password data and a condition field which contains a start or a failed data link identity. The start indication is used when starting or restarting communication on a primary channel. The failed data link indicaton is used when initiating communication on the dial backup channel for a failed or manually transferred from primary data link. Test—The test (TST) command results in a TST message sent to the CDT. Test commands can be sent routinely by the No. 1A AMARC or upon request via the No. 1A AMARC analysis I/O terminal. TST is used to check for trouble in the primary and dial backup data links.	End-of-block (EOB) characters (2 bytes) Cyclic redundancy check characters (2 bytes). Test—The test (TST) message is sent in response to receiving a TST message from the No. 1A AMARC. The TST message is used to test the sanity of the No. 1A AMARC/CDT interfacing.

attempts, the No. 1A AMARC will release the connection. The No. 1A AMARC will then send INIT messages (Fig. 5) over the affected primary channel at 1-minute intervals and periodically retry the backup channel. These retry actions will continue until normal communications are restored or until the primary channel is manually removed (**RMV CHL!**) from service.

Switching From Backup to Primary Data link

2.12 To switch from the backup link, the No. 1A AMARC sends INIT messages (Fig. 5) or sends the transmit command over the primary link to the CDT. The CDT retransmits the last unacknowledged data block previously sent over the backup link to the No. 1A AMARC. No. 1A AMARC polling then resumes over the primary link.

Generate Tracer Statistics (GTS) Sequence

2.13 When the No. 1A AMARC requires statistical information from a CDT, the GTS command is transmitted on either of the primary channels or the dial backup channel. The CDT then generates two SSM records and places them in its buffers along with billing data for transmission to the No. 1A AMARC. The transmission of these records will occur either immediately or in response to later transmit commands. An SSM record contains counts such as number of initial entries, number of attempts, number of calls abnormally terminated, and number of calls blocked or prevented from completing.

2.14 For additional information on No. 1A AMARC/CDT operation, see Section 201-900-103.

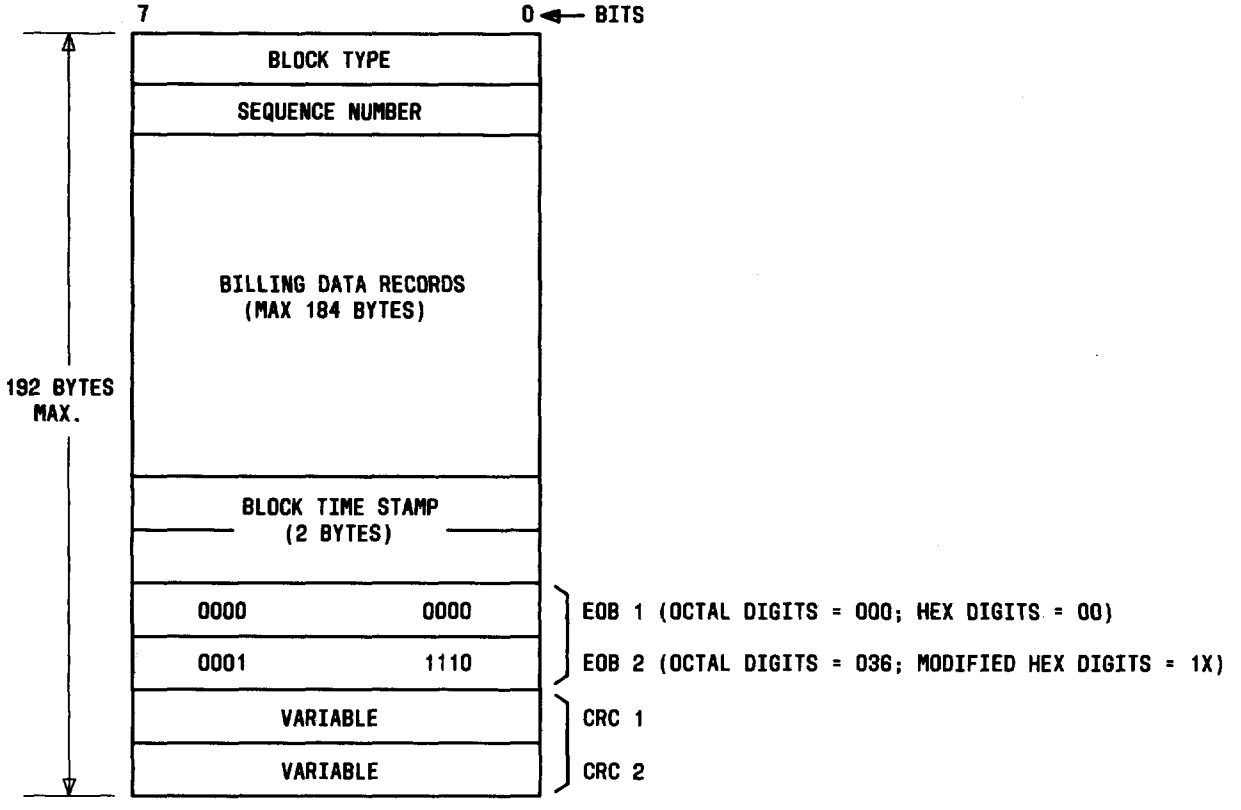


Fig. 1—Billing Data Information Block (CDT)

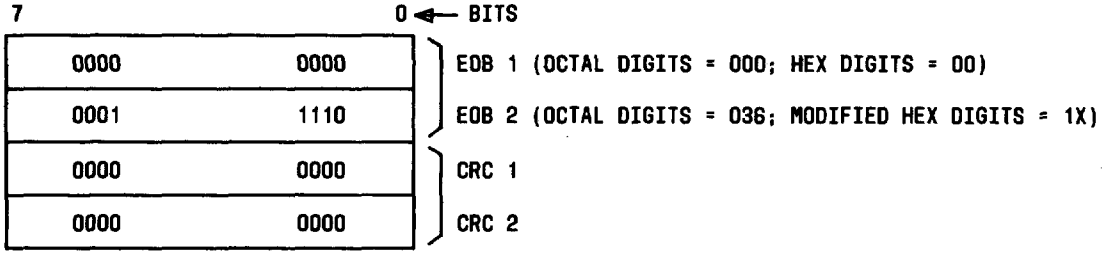


Fig. 2—No Data Block

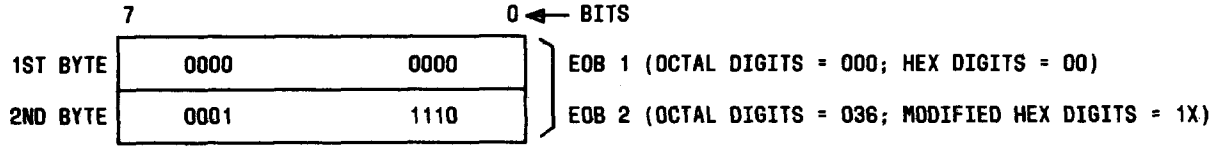
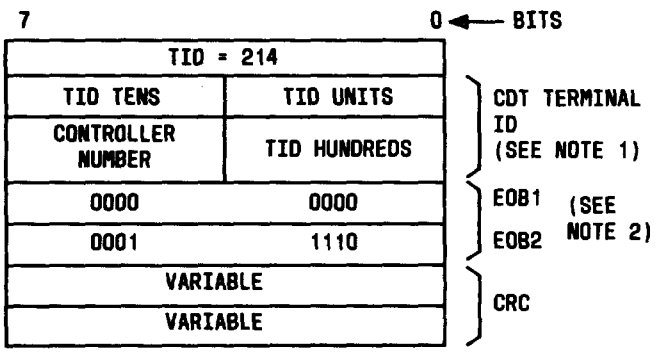


Fig. 3—End-of-Block Sequence



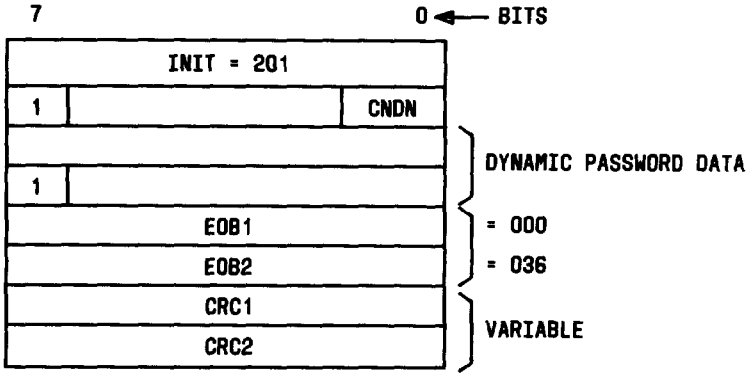
NOTES:
1. THE TID DATA IS IN BCD WITH LIFTED ZEROES.
2. EOB1 IS OCTAL 000 AND IS PRINTED AS TWO HEX DIGITS 00.
3. EOB2 IS OCTAL 036 AND IS PRINTED AS TWO MODIFIED HEX DIGITS 1X.

Fig. 4—Terminal Identification (TID) Message

3. TROUBLE ANALYSIS

3.01 The No. 1A AMARC I/O terminals provide very effective trouble analysis tools for No. 1A AMARC/CDT troubles. Effective clearing of troubles will require actions and verifications at both the No. 1A AMARC and the CDT office. The diagnostic test panel (DTP) of the CDT should be considered as a supplement to the No. 1A AMARC I/O terminals.

3.02 Section 201-900-328 provides the trouble messages that pertain to problems at the No. 1A AMARC. This section should be consulted initially to ensure that the trouble message printed indicates a CDT or channel trouble and not a No. 1A AMARC trouble. Table B lists the messages that are covered in this section and page reference to an associated description of the message. Throughout this section, reference will be made to



CNDN = CONDITION FIELD DATA (FIELD VALUE)

FIELD VALUE	MEANING
00	START (OR RESTART) OF COMMUNICATIONS (COMM) ON A PRIMARY CHANNEL
01	COMMUNICATION ON DIAL BACKUP BEGUN TO REPLACE FAILED PRIMARY CHANNEL 0
10	COMMUNICATION ON DIAL BACKUP BEGUN TO REPLACE FAILED PRIMARY CHANNEL 1
11	COMMUNICATION ON DIAL BACKUP BEGUN TO TEST THE DIAL BACKUP CHANNEL

Fig. 5—Initialization (INIT) Message

other input and output messages. The appropriate No. 1A AMARC input/output message (IM/OM) manual should be consulted for a complete description of these other messages and, when necessary, for messages in this section.

3.03 A given trouble printout is assigned to an I/O terminal on a priority basis. All alarm conditions will print on the active terminal along with daily and hourly system reports. All other trouble messages which do not generate alarms will print on the standby terminal. Therefore, the majority of trouble messages covered in this section will appear only on the standby terminal. In the event that the No. 1A AMARC is running in simplex, trouble printouts will appear as just described when the particular center is operating with the flexport arrangement described in paragraph 3.04. Otherwise, during simplex operation, all messages will appear on the active terminal.

3.04 For No. 1A AMARC utilizing Generic 3 program, a flexport arrangement permits interfacing with up to 16 I/O terminals. Flexports

TABLE B

CDT RELATED TROUBLE MESSAGES

TROUBLE MESSAGES	AMARS TROUBLE RELATIONSHIP	REFER TO PAGE
REPT CHL CDT CANCEL COMPLETE	CDT OR AMARC TROUBLE	22
REPT CHL INCORRECT TEST RESPONSE	CDT OR DATA LINK TROUBLE	22
REPT CHL INV IE DATA	CDT OFFICE OR CDT TROUBLE	34
REPT CHL INV IETYPE	CDT OR AMARC TROUBLE	32
REPT CHL TBL BLK OFL	DATA LINK OR CDT TROUBLE	15
REPT CHL TBL BLK TMOUT	DATA LINK OR CDT TROUBLE	16
REPT CHL TBL CANCEL RECEIVED	CDT TROUBLE	20
REPT CHL TBL CANCEL SCHEDULED	CDT OR AMARC TROUBLE	24
REPT CHL TBL CDT TID FAIL	CDT TROUBLE*	21
REPT CHL TBL CDT TRK AUD TRD FAIL	CDT OFFICE OR CDT TROUBLE	35
REPT CHL TBL CHAR O/UFLOW	CDT OR AMARC TROUBLE	25
REPT CHL TBL CRC	DATA LINK OR CDT TROUBLE	17
REPT CHL TBL CTS ERROR	DATA LINK OR CDT TROUBLE	18
REPT CHL TBL DUPLICATE CDT BLOCKS IGNORED	CDT OR AMARC TROUBLE	26
REPT CHL TBL ENTRY TIME INTVL ERR	CDT OR AMARC TROUBLE	27
REPT CHL TBL INVAL RTYPE	CDT OR AMARC TROUBLE	28
REPT CHL TBL INVALID BLOCK DATA	CDT OR AMARC TROUBLE	29
REPT CHL TBL INVALID BLOCK RESPONSE	CDT OR AMARC TROUBLE	30
REPT CHL TBL RLR TMOUT	DATA LINK OR CDT TROUBLE	19
REPT CHL TBL SRC A/B DATA	CDT OR AMARC TROUBLE	31
REPT CHL TBL WRONG BLKNO	CDT OR AMARC TROUBLE	33

* Trouble could result from incorrect nongeneric parameter data entered at the No. 1A AMARC.

are designated as FP00 through FP07 and FP10 through FP17. Flexports FP00 and FP01 have been dedicated to the system consoles (SC0 and SC1). SC0 is used for active processor messages and SC1 is used for standby or out-of-service processor messages. Manual isolation of a processor does not affect access to the system consoles by the other processor.

3.05 If an error message is appearing indicating a similar trouble on several different channels, it can be assumed that the trouble exists in some portion of the No. 1A AMARC itself, and reference is made to information covering No. 1A AMARC maintenance procedures. In many cases, it is not clear without further analysis where the source of the problem lies. In these cases, the references in Table B will indicate which other areas should be checked.

3.06 In general, every occurrence of a trouble will result in a trouble printout. There are two exceptions to this rule:

- The troubles are occurring in such a large volume that they cannot all be printed.
- Data link troubles will not result in a trouble message for every bad data block received.

Only repeatedly bad data blocks will result in a printed trouble message.

3.07 Detection of troubles will be realized through auditing of trunk and CDT sensor operations.

A. Audits of Trunk

Audits of Trunk Operation

3.08 No. 1A AMARC will audit trunk operation by performing various timing analyses on the supervisory states of the trunks. The supervisory states of trunks are defined by the S1 and CS scan points where S1 monitors the calling party supervision and CS monitors the called party supervision.

Never Answered Trunk Audit

3.09 This audit is used to detect an open CS lead condition (scan points or defective CS relay). An audit report will be issued if, for a given trunk, the circuit answer time (CS lead high interval) is less than the minimum chargeable duration (MCD = 2.4 sec) for 32 consecutive times. This audit will be reset when any call on the trunk satisfies the MCD requirement (ie, the answer interval is greater than or equal to 2.4 seconds).

Always Answered Trunk Audit

3.10 This audit is used to detect reversed T and R supervision on a reversed supervision trunk, or any other trunk trouble where always answered supervision is seen. An audit report will be issued for a given trunk if the called party answer supervision (CS high) interval is greater than or equal to the minimum chargeable duration (MCD = 2.4 sec) for 32 consecutive calls. This audit will be reset on a call attempt for which no answer is detected (or answer interval is less than the MCD).

3.11 For certain trunks going to destinations that can validly answer on 32 consecutive calls, such as trunk-side announcement machines (weather, time, and temperature, etc) or directory assistance operator routes, audit exceptions will have to be made based on matching the called number on the call with the called numbers appearing on an "audit exception table" associated with these kinds of trunk routes.

Short Holding Time Trunk Audit

3.12 This audit detects reversed supervision condition on the T and R leads of reverse supervision trunks, bad transmission on trunks, or faulty trunk operation. The audit fails if the call answered interval (CS high) is greater than or equal to the MRD (200 ms) but less than 15 seconds for eight consecutive calls. This audit is reset to zero whenever a call is answered for greater than or equal to 15 seconds. Trunks dedicated to trunk-side announcement machines will require audit exception treatment based on called number matching with the call numbers appearing on an "audit exception table" associated with these kinds of trunk routes.

Busy Trunk Audit (Interval can be 1-7 days)

3.13 Associated with "midnights passed digit processing", the No. 1A AMARC will provide a printout of all trunks that have been in a busy state for the previous audit period. This audit identifies trunks that are made busy, unequipped,

or never used. This may indicate an open S1 lead or a trunk not wired in.

3.14 The list of all trunks that have been busy for the audit interval will be printed daily by the No. 1A AMARC. Systems engineering is generating new requirements for generating a billing record on a daily basis instead of every nine days on long, multiday duration calls.

Unused Trunk Audit

3.15 Associated with midnight call processing activity, a list of in-service trunks that have remained idle for the previous audit interval will be printed. This list will identify trunks that have been made "maintenance busy". It will also identify trunks that are in active service but have not received a service usage during that period.

3.16 This audit will detect the trouble condition where the S1 lead and/or scan point are open. An open CS lead condition (with the S1 scan point still operational) will be detected by the **Never Answered Trunk Audit**. A stuck at ground S1 lead is also indicated by the REPT CHL TBL CDT TRK AUD TRD FAIL trouble message.

3.17 Obviously, any validly working trunks that fail to get a service usage during the previous audit period will also appear on the list. This should very rarely occur.

B. Audits of CDT Sensor

Continuous No Data Audit

3.18 If No. 1A AMARC receives a continuous flow of no data messages (from a sensor, on a channel) for a period of 1 hour, No. 1A AMARC will automatically initiate a test message exchange with the CDT on (one of) the channel(s). If the test sequence fails, the No. 1A AMARC will stimulate appropriate reports and alarms; otherwise, the stream of no data blocks will be interpreted as a normal "no-billing-activity" indication for the interval.

CDT Clock Audit

3.19 An audit of the CDT interval clock shall be performed periodically by No. 1A AMARC. This audit will be performed automatically at some specified time and may also be initiated manually via an I/O terminal message. The "test CDT clock" command causes the No. 1A AMARC to select a data block and record the CDT time along with time of the No. 1A AMARC for that data block. At some later time (1 to 2 minutes) another data block is selected and both the CDT and No. 1A AMARC times are recorded. The respective time intervals for the CDT clock and the No. 1A AMARC clock are then computed for output on the I/O terminal. The time intervals are compared and any significant discrepancies can be reported to the responsible maintenance personnel. There will be no data link message exchange between the CDT and No. 1A AMARC due to a failure of the CDT interval clock audit.

3.20 The CDT will detect almost all errors in the initial entry billing data and report the trouble condition in the No. 5 crossbar switching office. In most cases, the CDT will then transmit to No. 1A AMARC this billing data in an initial entry marked by its record type as containing some invalid data.

3.21 The No. 1A AMARC generally will not provide redundant trouble reporting of billing data errors that were detected by the CDT and reported at the CDT switching office. No. 1A AMARC will keep appropriate counts, as specified in the tracer record requirements, of the billing records received that contained invalid data to permit auditing of the number of those records received.

3.22 Any redundant trouble reporting of CDT detected troubles by the No. 1A AMARC should be limited to performing a monitoring function of billing related activity in the CDT office during periods when the office is unattended and/or reporting an emergency action (high repetition rate) trouble with significant revenue impact. For other billing record data errors which No. 1A AMARC detects but which may have gone undetected at the CDT (ie, there is no positive indication in the received data that the CDT has detected and reported the error[s]), No. 1A AMARC will provide appropriate trouble reports. No. 1A AMARC will provide the needed status and trouble reports for line protocol failures, for message sequencing and data errors, and for record sequencing errors.

3.23 The No. 1A AMARC will issue status, trouble, or exception reports for the following:

Call Processing Message or Record Sequencing or Data Errors

- Errors in the initial entry billing data for which the CDT has not provided a positive indication that it has previously detected and reported the error(s) in the switching office (eg, BCD coding failures on called or calling digits, missing required data items, etc)
- Billing translation failures reflecting invalid (but properly coded) billing data or billing data base problems (eg, COI translation failure, invalid code digit combinations that will not complete billing translations validly, ie, unassigned codes, invalid codes, etc)
- Message and record format violations, including block overflow, partial blocks, etc
- Trunk identify if out of range
- Out-of-sequence billing records for a given trunk
- Receipt of a duplicate data block (ie, data blocks received in response to successive transmit commands have the same source sequence number)
- Receipt of an invalid record type
- Trunk data source transfer from one channel to another
- Nonresponsive message received from the CDT in reply to a No. 1A AMARC command
- Test message response failure
- Test message response valid
- Trunk data source transfer irregularities (eg, channel to source linkage failures)
- Receipt of an SSM message from the CDT.

Cancel or Charge Guard Actions

- Cancel message received from the CDT indicating it has reinitialized
- Completion of cancel action in response to a cancel request from the CDT
- Receipt of a trunk scan board charge guard (TSCG) request from the CDT
- Completion of the charge guard action in response to a TSCG request
- Any No. 1A AMARC detected condition which causes the No. 1A AMARC to charge guard all calls in progress for a given CDT controller
- Detection of an apparent CDT controller by the No. 1A AMARC as evidenced by the receipt of "n" successive nonresponsive or badly mutilated messages, causing the No. 1A AMARC to cancel all calls in progress.

Line Protocol Status or Trouble Reports

- Report of channel initialization
- CRC check failures on received messages
- Failure to resume polling on a channel within "n" seconds following receipt of the previous data block
- Software detection of incorrect number of timing control flags being set
- Remote location response (RLR) time-out
- Receipt of an invalid CDT terminal identification (TID).

Trunk Audit Reports

- List of all trunks that have failed the unused audit. This list is printed as part of the "midnight routine" processing.
- List of trunks that have failed the busy audit. This list is printed as part of the "midnight routine" processing.

- Report the identity of trunk(s) that fail the short holding time audit, the always answered audit, or the never answered audit, or the timed release disconnect (TRD). These reports are issued for each trunk when the audit failure is detected.

CDT Clock Audit Reports

- Report the successful completion of the CDT interval clock test as requested by the "test clock command". This report provides the time difference between two data blocks as recorded by the CDT clock and the No. 1A AMARC clock.

- Report that the test of the CDT interval clock has aborted because it cannot be successfully completed.

3.24 An automatically initiated test (TST) sequence by the No. 1A AMARC periodically verifies the sanity of the No. 1A AMARC/CDT interface. This TST sequence may also be initiated manually from the I/O terminal as necessary to verify the interface sanity. A TST sequence automatically initiates when no billing data is received in the last hour by the No. 1A AMARC. The TST sequence interleaves with polling on the primary or dial backup data link. The TST sequence is applicable as follows:

(a) To a polling primary or dial backup data link, or

(b) To a primary or dial backup data link not polling (sanity checks for potential faults or fault clearing).

The TST sequence verifies:

(a) That the CDT and the No. 1A AMARC are not locked in any particular mode, and

(b) That no problem exists in the data links via loop around test capabilities.

3.25 The TST sequence consists of a TST message (Fig. 6) transmitted by the No. 1A AMARC to the CDT. The CDT uses the bit pattern of the TST message to test the associated controller. If the bit pattern is not correct as received at the CDT, the CDT takes a trouble record card. This trouble record card may allow further analysis of the bit pattern received and that expected. The CDT then calculates a CRC for the bit pattern received and transmits the CRC value along with the bit pattern received back to the No. 1A AMARC. This incorrect bit pattern received at the CDT indicates data link troubles in the direction of No. 1A AMARC to the CDT. If the correct bit pattern is received at the CDT, the CDT transmits the received data block back to the No. 1A AMARC.

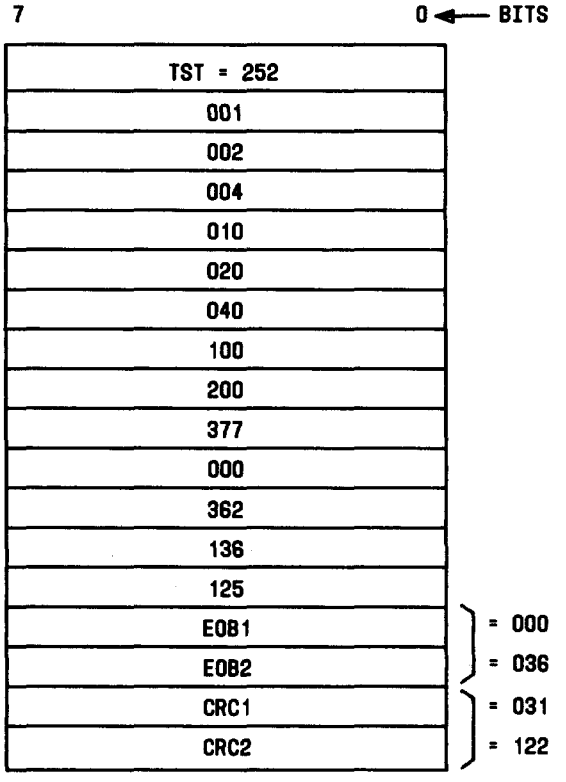


Fig. 6—Test (TST) Message

3.26 The No. 1A AMARC then verifies the expected bit pattern in the received data block. When No. 1A AMARC receives the same bit pattern it transmitted earlier, this condition indicates no trouble in the No. 1A AMARC/CDT interface. An ***incorrect bit pattern*** and ***correct CRC*** received at the No. 1A AMARC indicates trouble in the data link direction from No. 1A AMARC to the CDT. A ***correct bit pattern*** and an ***incorrect CRC*** received at the No. 1A AMARC, indicates trouble in the data link direction from CDT to the No. 1A AMARC. For test failures, a message prints out at the No. 1A AMARC.

3.27 In order to accurately troubleshoot CDT office troubles, troubles that are associated with the data links should be analyzed and cleared first. Then, troubles associated with the CDT office should be analyzed and cleared.

3.28 When a trouble involves a circuit pack, replace the circuit pack and see if the problem has cleared. Analysis of trouble messages, observance of the CDT diagnostic test panel (DTP), and use of fault locating diagnostic data as displayed at the DTP will provide means of identifying faulty circuit packs.

3.29 If a pack replacement does not clear the trouble, it should be removed and the original circuit pack reinstalled. The replacement sequence should not be attempted on the single appearance of a given trouble. This may only indicate a transient condition that will clear itself automatically. Action should be taken only if the trouble is repeated or affects the ability to bill accurately. Troubles affecting the ability to bill will cause an alarm.

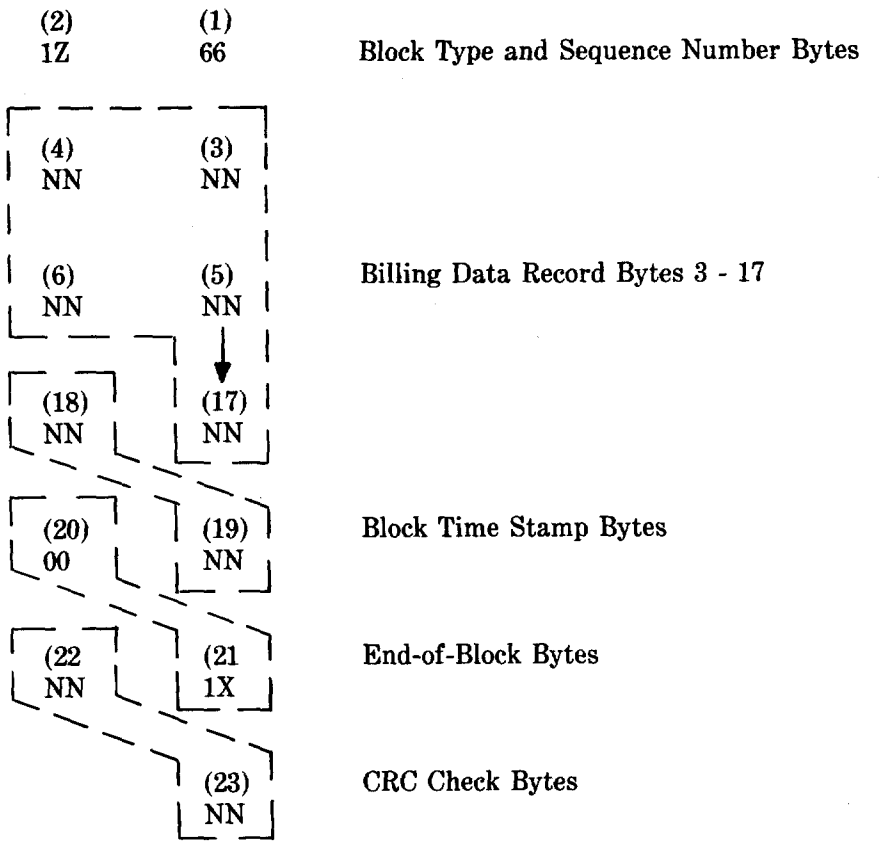
3.30 When a trouble is not cleared after replacing a circuit pack in a suspected trouble area, more than one trouble may be present. To cover this situation, all other trouble associated circuit packs should be replaced at one time. If this clears the trouble, the original cards should be reinserted one at a time until the trouble reappears. If the trouble persists, the trouble must be traced using associated CDs, SDs, and test sets.

3.31 Several trouble messages (particularly data link troubles) will automatically print the contents of the IAT. The value of the bytes stored in the IAT is not apparent from looking at this printout. This is due to the IAT being printed in a series of BCD or modified HEX digits. Each pair of BCD or modified HEX digits represents a byte. For example, in response to a transmit poll message for billing data, the CDT would send the following sequence of bytes:

1 — 01100110	Block Type (2 BCD digits = 66, see Note)
2 — 00011010	Sequence Number (2 modified HEX digits = 1Z)
3 … 17	Billing Data Record (only one IE record indicated)
18 … 19	Block Time Stamp (4 BCD digits)
20 — 00000000	End-of-Block Characters (octal word 000036; 2 modified HEX digits = 00 and 1X for each byte, respectively)
21 — 00011110	
22 … 23	CRC Check Characters (Variable depending on data block content)

Note: Block type 66 contains only billing data records.

3.32 At the time of transfer to memory, the bytes are packed two per word in the IAT in the following manner:



3.33 For the data block shown in paragraph 3.32, the corresponding printed IAT would be:

66 1Z $NN_{(3)}$ $NN_{(4)}$ $NN_{(5)}$ $NN_{(6)}$ ⟶ $NN_{(17)}$ $NN_{(18)}$ $NN_{(19)}$

00 1X $NN_{(22)}$ $NN_{(23)}$

4. DATA RECOVERY OPERATION

4.01 Because of the transient nature of many data link troubles, special trouble handling routines are used by No. 1A AMARC. These consist of routines to automatically request retransmission of a block of data when a data link error occurs and not printing a trouble message until multiple errors of the same type have occurred. These routines, called working modes, function in a similar manner with all remote terminals. When a data link trouble occurs, working modes operate in the following manner:

(1) Send a retransmit command several times for the next 9 seconds. If there is a transient fault in the data link, the trouble should clear within this interval, and an error-free block should be received. If the trouble is still present at this point, the appropriate data link error

message will be printed. It should be noted that this method of operation means many random errors can occur on a data link and not be printed. However, these transient errors are counted and printed as TRBL counts in the hourly OP CNT CHL message in the trouble column.

(2) If an error-free block has not been received, the standby processor is checked to determine if it is receiving an error-free block. If it is, the I/O hardware of the active processor is assumed to be at fault and a processor switch is performed.

(3) If both processors indicate an error, a request for new data is sent by the No. 1A AMARC to the remote terminal in order to clear up any garbled data in the terminal output buffer.

(4) If the error is still present after the new block is received, the dial backup channel is used to form an alternate data path. This should eliminate any hard faults on the primary data link. Following establishment of the dial backup link, a retransmit command is sent to the CDT. If it succeeds, communication continues on the backup link. If it fails, retransmit pools are requested until a successful reply is received or until 9 seconds have elapsed, whichever occurs first. If, after 9 seconds, there has not been a successful poll, the backup connection is released and retransmit commands are sent on the primary link. Retransmit commands will continue until data communications are restored or until the data link is removed from service.

(5) If the previous steps do not clear the trouble, the channel is considered faulty and automatically removed from service with an RMV CHL message printed.

4.02 The signaling sequence, when the backup link is established, will ensure that the order of transmitting call record data blocks will be retained without loss of the data. Restoring a primary data link to service is under control of the No. 1A AMARC. This can be effected regardless of whether the backup link is in use at this time. If the faulty data condition disappears without the activation of the data link backup, the primary data link is restored to service by the cessation of retransmits from the No. 1A AMARC and the subsequent receipt by the CDT of a transmit message. If a primary is to be restored to service after the backup link has been in service, all messages over the backup link will cease, and the first command from the AMARC over the primary will be a transmit. The CDT will respond with normal data communications.

4.03 A more complete description of the working mode strategy for the No. 1A AMARC is provided in Section 201-900-103.

5. NO. 1A AMARC/CDT RELATED TROUBLE MESSAGE ANALYSIS

5.01 This part provides trouble messages that can occur in a No. 1A AMARC/CDT arrangement and the procedures used to resolve these trouble conditions.

5.02 Trouble messages are shown for No. 1A AMARC (Generic 3).

A. Data Link Troubles

tt REPT CHL aab TBL BLK OFL ccc ddd
ll: nn nn, etc

Explanation of Message: Report channel trouble block overflow. This message is printed when the number of data characters received by the No. 1A AMARC exceeds the maximum allowed for the remote location. Each occurrence of this trouble is not printed unless the MON CHL or MON TBL input message has been entered. Thresholding on this trouble is automatically performed, and the message appears only after three consecutive attempts to clear the problem.

Explanation of Variable Fields:

aa = DZ11B data channel multiplexer number (00-13 octal).

b = multiplexer port (0-7).

ccc = maximum data block size for the channel as determined by entity type (036, 068, or 256).

ddd = error or unequipped encountered when determining entity type (ERR, UEQ, or blank).

ll = line number (00-12 decimal).

nn = byte values in IAT (BCD).

Trouble Description: This message occurs when the number of data characters in a data block transmitted to the No. 1A AMARC exceeds the maximum allowed limit of 192.

Severity of Lost Revenue: No lost revenue since the No. 1A AMARC signals the CDT for a retransmit of the data. If the trouble does not clear within 9 seconds, the No. 1A AMARC automatically enables the backup data channel.

Trouble Resolution:

Action at the No. 1A AMARC

Ignore isolated occurrences; they are probably caused by random troubles such as noise on the data link. If the trouble occurs repeatedly, try to clear it with a manual switch to the backup data link if an automatic switch has not already occurred. If backup data link operation clears the problem, the trouble is data link related on the primary channel—test the data set and data link. If backup data link operation does not clear the problem, the trouble is probably in CDT hardware. Notify appropriate personnel at the CDT office and give the faulty channel number.

Action at the CDT

If operation on the backup data link clears the problem, the trouble is probably due to a faulty data set or data link for the primary channel.

If operation over the backup data link does not clear the problem, perform CDT diagnostics (Section 218-779-301) at the DTP of the associated controller. Analyze results of diagnostic tests on the alphanumerical display of the DTP and take appropriate corrective action. To analyze results of diagnostic tests and determine corrective action, refer to Sections 218-779-105 and 218-779-106.

A tt REPT CHL aab TBL BLK TMOUT cccccc dddddd eee fff
ll: nn nn, etc

Explanation of Message: Report channel trouble block time-out. This message is printed when a block of data transmitted from the remote location is only partially received before the expiration of a timing interval (note that since scan response timing has succeeded, some data has been received). This error can occur if, for example, the carrier fails during the transmission of a data block or the end-of-block sequence is obliterated by a noise burst. This message is followed by a printout giving the contents of the IAT for the failing channel. Each occurrence of this trouble is not printed unless the MON CHL or MON TBL input message has been entered. Thresholding on this trouble is automatically performed, and the message appears only after 3 consecutive attempts to clear the problem.

Explanation of Variable Fields:

aa = DZ11B data channel multiplexer number (00-13 octal).

b = multiplexer port (0-7).

cccccc = the contents of the data set control read/write buffer register DRRWBR (octal). (Refer to Table C for bit definition.)

dddddd = the contents of IATC: The IAT control word (octal). (Refer to Table D for bit definition.)

eee = maximum data block size for the channel as determined by entity type (036, 068, or 256).

fff = error or unequipped encountered when determining entity type (ERR, UEQ, or blank).

ll = line number (00-12 decimal).

nn = byte values in IAT (BCD).

Trouble Description: This message is printed when a block of data transmitted to the No. 1A AMARC is only partially received before the expiration of a timing interval.

Severity of Lost Revenue: No lost revenue since the No. 1A AMARC signals the CDT for a retransmit of the data. If the trouble does not clear within 9 seconds, the No. 1A AMARC automatically enables the backup data channel.

Trouble Resolution:

Action at the No. 1A AMARC

Ignore isolated occurrences; they are probably caused by random troubles such as noise on the data link. If the trouble occurs repeatedly, try to clear it with a manual switch to the backup data link if an automatic switch has not already occurred. If backup data link operation clears the problem, the trouble is data link related on the dedicated channel; test the data set and data link. If dialup data link operation does not clear the problem, the trouble is probably in the CDT hardware. Notify appropriate personnel at the CDT office giving the faulty channel number.

Action at the CDT

If operation on the backup data link clears the problem, the trouble is probably due to a faulty data set or data link for the dedicated channel. If operating over the backup data link does not clear the problem, perform CDT diagnostics (Section 218-779-301) at the DTP of the associated controller. Analyze results of diagnostic tests on the alphanumerical display of the DTP and take appropriate corrective action. To analyze results of diagnostic tests and determine corrective action, refer to Sections 218-779-105 and 218-779-106.

---

tt REPT CHL aab TBL CRC dddddd eeeeee fff ggg
ll: nn nn, etc

Explanation of Message: Report channel trouble with CRC. This message is printed when, on repeated polls, the CRC character transmitted from the remote location does not match the CRC character at the No. 1A AMARC for the received data. This message is followed by a printout giving the contents of the IAT for the failing channel. Each occurrence of this trouble is not printed unless the MON CHL or MON TBL input message has been entered. Thresholding on this trouble is automatically performed, and the message appears only after three consecutive attempts to clear the problem.

Explanation of Variable Fields:

aa = DZ11B data channel multiplexer number (00-13 octal).

b = multiplexer port (0-7).

dddddd = indicates the CRC computed by software (octal).

eeeeee = indicates the CRC value transmitted from the remote location.

fff = maximum data block size for the channel as determined by entity type (036, 068, or 256).

ggg = error or unequipped encountered when determining entity type (ERR, UEQ, or blank).

ll = line number (00-12 decimal).

nn = byte values in IAT (BCD).

Trouble Description: This message is printed when the CRC computed by the No. 1A AMARC disagrees with that sent by the CDT. This error indicates a working mode analysis and can result in a channel switch to backup or in a system switch.

Severity of Lost Revenue: Normally no lost revenue since the No. 1A AMARC signals the CDT for a retransmit of the data. If the trouble does not clear within 9 seconds, the No. 1A AMARC automatically enables the backup data channel.

Trouble Resolution:

Action at the No. 1A AMARC

Ignore isolated occurrences; they are probably caused by a random trouble such as noise on the data link. If the trouble occurs repeatedly or if it has caused the No. 1A AMARC to transfer to the backup data link, analyze the message parameters; determine if the problem is in the CRC unit, data set, data link, or remote location. If it appears that the trouble is at the remote location, notify appropriate personnel at the CDT office giving the faulty channel number.

Action at the CDT

If the problem is recurring, the No. 1A AMARC will switch to the backup channel for the affected primary channels. If this clears the problem, the trouble is probably due to a faulty data set for the dedicated channel.

If operating over the backup data link does not clear the problem, perform CDT diagnostics (Section 218-779-301) at the DTP of the associated controller. Analyze results of diagnostic tests on the alphanumerical display of the DTP and take appropriate corrective action. To analyze results of diagnostic tests and determine corrective action, refer to Sections 218-779-105 and 218-779-106.

---

tt REPT CHL aab TBL CTS ERROR dddddd eeeeee

Explanation of Message: Report channel trouble clear-to-send error. This message is printed when a clear-to-send indication is not received from the data set connection circuit following an attempt to turn a channel data set from the receive to the send mode. Each occurrence of this trouble is not printed unless the MON CHL or MON TBL input message has been entered. Thresholding on this trouble is

automatically performed, and the message appears only after three consecutive attempts to clear the problem.

Explanation of Variable Fields:

aa = DZ11B data channel multiplexer number (00-13 octal).

b = multiplexer port (0-7).

dddddd = indicates the contents of the data set control read/write buffer register DRRWBR. (Refer to Table C for bit definitions.)

eeeeee = indicates the contents of the data set control read-only buffer register DRIROR. (Refer to Table E for bit definitions.)

Trouble Description: This message is printed when a clear-to-send indication is not received from the No. 1A AMARC data connection circuit following an attempt to turn the channel data set from the receive to send mode.

Severity of Lost Revenue: Normally no lost revenue since the No. 1A AMARC signals the CDT for a retransmit of the data. If the trouble does not clear within 9 seconds, the No. 1A AMARC automatically enables the backup data channel.

Trouble Resolution:

Action at the No. 1A AMARC

Do not notify the CDT office. Analyze the message printout. (Refer to Section 201-900-324 to determine if a fault exists in the asynchronous data set interface circuit or the data set.)

Action at the CDT

Take no action. This is a data set related problem at the No. 1A AMARC end.

---

tt REPT CHL aab TBL RLR TMOUT dddddd eeeeee

Explanation of Message: Report channel remote locaton response time-out. This message indicates that a response from the remote terminal has not been received within the allotted time interval. Each occurrence of this trouble is not printed unless the MON CHL or MON TBL input message has been entered. Thresholding on this trouble is automatically performed, and the message appears only after three consecutive attempts to clear the problem.

aa = DZ11B data channel multiplexer number (00-13 octal).

b = multiplexer port (0-7).

dddddd = indicates the contents of the data set control read/write buffer register DRRWBR (octal). (Refer to Table C for bit definitions.)

eeeeee = indicates the contents of the data set control read-only buffer register DRIROR (octal). (Refer to Table E for bit definitions.)

Trouble Description: The CDT fails to respond to a request for data.

Severity of Lost Revenue: Normally no lost revenue since the No. 1A AMARC signals the CDT for a retransmit of the data. If the trouble does not clear within 9 seconds, the No. 1A AMARC automatically enables the backup data channel.

Trouble Resolution:

Action at the No. 1A AMARC

Ignore isolated occurrences; they are probably caused by random troubles such as noise on the data link. If the trouble occurs repeatedly, try to clear it with a manual switch to the backup data link if an automatic switch has not already occurred. If backup data link operation clears the problem, the trouble is data link related on the dedicated channel; test the data set and data link. If backup data link operation does not clear the problem, the trouble is probably in the CDT hardware. Notify appropriate personnel at the CDT office giving the faulty channel number.

Action at the CDT

If operation on the backup data link clears the problem, the trouble is probably due to a faulty data set or data link for the dedicated channel. If operating over the backup data link does not clear the problem, perform CDT diagnostics (Section 218-779-301) at the DTP of the associated controller. Analyze results of diagnostic tests on the alphanumerical display of the DTP and take appropriate corrective action. To analyze results of diagnostic tests and determine corrective action, refer to Sections 218-779-105 and 218-779-106.

B. CDT Troubles

tt REPT CHL aab TBL CANCEL RECEIVED

Explanation of Message: Report channel trouble cancel received. This message indicates that AMARC has received a data block containing a cancel record as the first record in one of the data streams from a reinitialized CDT controller. Additional billing data for the respective data source may follow the cancel record in the data block. When a CDT controller reinitializes, it generates two cancel records and places one into each of the first data blocks to be sent in the two data streams.

Explanation of Variable Fields:

aa = DZ11B multiplexer data channel number (00-13).

b = multiplexer port (0-7).

cc = source data stream in index indicating which stream's data block carried the cancel record.

= 0 = source A data stream

= 1 = source B data stream

Trouble Description: This message is printed to indicate the operational status of the CDT controllers served by the AMARC.

Severity of Lost Revenue: Affected call data will be discarded and not written on AMA tape, written on tape but minimum duration billed, or written on tape if determined valid.

Trouble Resolution:

Action at the AMARC

When this message occurs repeatedly, it indicates a CDT controller in trouble. Alert CDT maintenance personnel if this message is repeatedly occurring. Remove associated controller channels until the controller has been repaired.

Action at the CDT

For repeatedly occurring messages at the AMARC, perform CDT diagnostics (Section 218-779-301) at the DTP of the associated controller. Analyze results of diagnostic tests from the alphanumerical display of the DTP and take appropriate corrective action. To analyze results of diagnostic tests and determine corrective action, refer to Sections 218-779-105 and 218-779-106.

Note: For REPT CHL TBL CDT TID FAIL trouble message, it could be No. 1A AMARC trouble instead of a CDT trouble. Nongeneric parameter data as entered at the No. 1A AMARC may be incorrect.

tt REPT CHL aab TBL CDT TID FAIL cccccc dddddd

Explanation of Message: Report channel trouble terminal identification failure. This message is printed when the terminal identification number (TID) transmitted by a CDT in response to an initialize command from No. 1A AMARC does not match the number assigned to that CDT in the No. 1A AMARC nongeneric parameter data.

Explanation of Variable Fields:

aa = DZ11B data channel multiplexer number (00-13 octal).

b = multiplexer port (0-7).

cccccc = CDT terminal identification data received from the CDT controller associated with primary channel **aab**.

dddddd = CDT terminal identification data from AMARC NPD for associated primary channel **aab**.

Trouble Description: The transmitted CDT TID number does not match the number assigned in the No. 1A AMARC nongeneric parameter data (NPD) for that CDT.

Severity of Lost Revenue: No lost revenue since No. 1A AMARC will print an error message and continue normal polling when the incorrect TID is received.

Trouble Resolution:

Action at the No. 1A AMARC

Verify that the identification number is properly recorded in the No. 1A AMARC NPD and that the number recorded matches the Western Electric base and control number for the CDT. (Refer to Section 201-900-327.) If TID is correct, consult with responsible personnel at the CDT office.

Action at the CDT

Verify TID is correct for the CDT. If not correct, enter corrected TID and notify the No. 1A AMARC.

---

tt REPT CHL aab INCORRECT TEST RESPONSE ccc ddd

[Contents of IAT]

Explanation of Message: This message occurs when the data block as received at the No. 1A AMARC does not match the test data block transmitted to the CDT. Periodically the No. 1A AMARC transmits a test data block to the CDT. (Refer to the IM/OM manual for data block contents and to Fig. 6.)

Explanation of Variable Fields:

aa = DZ11B data channel multiplexer number (00-13 octal).

b = multiplexer port (0-7).

ccc = indicates the primary channel being served.

ddd = the contents of the IAT byte count.

Trouble Description: An INCORRECT TEST RESPONSE message is received from the CDT.

Severity of Lost Revenue: Normally no lost revenue if CDT primary channel troubles are occurring since the No. 1A AMARC automatically enables the backup data channel.

Trouble Resolution:

Action at the No. 1A AMARC

Verify correct data link operation. If messages are repeatedly occurring and data link is OK, notify appropriate personnel at the CDT office.

Action at the CDT

Determine if software or hardware faults. Verify software or hardware faults with CDT diagnostics (Section 218-779-301) at the DTP of the associated controller. Perform appropriate corrective action. To analyze results of diagnostic tests and determine corrective action, refer to Sections 218-779-105 and 218-779-106.

---

tt REPT CHL aab CDT CANCEL COMPLETE ccdd
tt LOST = eeee, UNDER = ffff

An optional additional line is printed for trunk scan charge guard (TSCG) only:

tt COL = gg. TLF = hh, i---i

Explanation of Message: Report channel CDT cancel complete. This message indicates that a cancel action is complete. The cancel action on call data may be initiated by the CDT or the AMARC. This message is preceded by one or both of the following messages:

REPT CHL TBL CANCEL RECEIVED

REPT CHL TBL CANCEL SCHEDULED

This message occurrence may result in incrementing the lost and/or underbilled counts in the OP CNT CHL output.

Explanation of Variable Fields:

aa = DZ11B multiplexer data channel number (00-13 octal).

b = multiplexer port (0-7).

cc = AM for AMARC initiated cancels.

= CT for CDT initiated cancels.

= TG for TSCG cancels (CDT initiated).

dd = CD if calls in progress were discarded and not written to AMA tape.

= MD if calls in progress were written to tape with minimum duration billing intervals.

= VT if calls in progress were written to tape with billing intervals derived from a valid disconnect time (ie, the latest time at which it was known that the CDT and AMARC interface was performing in a sane and proper manner).

eeee = count of calls lost due to the cancel.

ffff = count of calls underbilled due to the cancel.

gg = This field indicates the trunk scanboard column number. Trunk scanboard charge guards affect only a limited number of trunks, namely the 16 odd or even trunks assigned to a group of up to four trunk link frames associated with a specific trunk scanboard column.

hh = This field indicates the TLF number in which the TSCG was started. For example, if **hh** is 4, then the 16 odd or even CRR's associated with TLF's 4 through 7 were cancelled. Note, no more than 4 TLF's will be processed, but fewer than 4 will be processed if one or more of the higher TLF's on the column are unequipped.

i---i = ODD or EVEN depending on whether the odd or even trunks were affected.

Trouble Description: This message indicates that a cancel action is complete for call data received over a CDT channel. This message occurs after a received cancel (CDT initiated) or a scheduled cancel (AMARC initiated).

Severity of Lost Revenue: As a result of the cancel action, calls over the affected channel may be discarded and not written on AMA tape; written on tape but billed minimum duration; or written on tape after determined valid.

Trouble Resolution:

Action at the AMARC

Expect a limited number of these messages from time to time. Discuss with personnel responsible for the operation and maintenance of the affected CDT when there is an excessive number of these messages. With an AMARC stimulated cancel action, trouble may be either the CDT or AMARC. Verify with CDT maintenance personnel if CDT trouble exists. If CDT operation verified valid and cancel actions continue, refer trouble to software support for resolution.

Action at the CDT

Action taken depends on results of discussion with responsible AMARC personnel when an excessive number of these messages is occurring. CDT operation may be verified with CDT diagnostics (Section 218-779-301). Refer to Sections 218-779-105 and 218-779-106 to analyze results of diagnostic tests and determine corrective action.

---

tt REPT CHL aab TBL CANCEL SCHEDULED ccc ddd eee

Explanation of Message: This message is printed to indicate a scheduled cancel action. This scheduled cancel action may be CDT or AMARC stimulated. Scheduled cancel operations can occur for call record registers (CRRs) associated with an entire CDT controller or for CRRs associated with even trunks (source A) or for the odd trunks (source B) of a trunk scan board (ie, a TSCG) of a given controller.

Explanation of Variable Fields:

aa = DZ11B multiplexer data channel number (00-13 octal).

b = multiplexer port (0-7).

ccc = controller index in octal number which identifies the controller whose CRRs are being scheduled for cancel action.

ddd = type of cancel action requested (in octal). Bits 2, 3, = type of cancel, bits 0, 1 = severity of cancel.

= 001 = AMARC stimulated—call discard (CD) cancel of entire controller.

= 002 = AMARC stimulated—minimum duration (MD) bill cancel of entire controller.

= 003 = AMARC stimulated—cancel entire controller to valid time (VT) of origin of earlier entry received in a prior block.

= 005 = CDT stimulated controller cancel—CD.

= 006 = CDT stimulated controller cancel—MD.

= 007 = CDT stimulated controller cancel—VT.

= 011 = CDT stimulated TSCG—CD

= 012 = CDT TSCG—MD

= 013 = CDT TSCG—VT

eee = type of cancel action actually scheduled (AMARC troubles or the prior posting of a more severe cancel request may cause this to be a more severe category of cancel than indicated in ddd above). (Values have the same meaning as shown under **ddd** above.)

Trouble Description: Cancel action is scheduled for CRRs. This action may either be AMARC or CDT stimulated.

Severity of Lost Revenue: Affected call data will be either discarded and not written on AMA tape, written on tape but MD billed, or determined if valid and written on tape.

Trouble Resolution:

Action at the AMARC

Determine if cancel actions are CDT or AMARC stimulated. For rapidly repeating CDT stimulated controller cancel actions, notify CDT maintenance personnel to verify CDT controller operation. Examine trouble reports preceding this message to determine if cancel action is AMARC stimulated. Repeatedly occurring AMARC stimulated cancel actions may be either due to a CDT controller or a program execution error. If CDT controller operation is valid and cancel actions continue, then refer the trouble to software support for resolution.

Action at the CDT

To verify CDT controller operation, perform CDT diagnostics (Section 218-779-301) at the DTP of the associated controller. Analyze results of diagnostic tests from the DTP alphanumerical display and take appropriate corrective action. Refer to Sections 218-779-105 and 218-779-106 to analyze results of diagnostic tests and determine corrective action. Notify AMARC maintenance personnel about results since problem could be at the AMARC.

---

tt REPT CHL aab TBL CHAR O/UFLOW cccccc dddddd eeeeee

Explanation of Message: Prior to processing any billing record out of a data block (dblk), CDT call processing steps through all records in the dblk to verify that the record type and the billing record is valid. This message is printed when, after stepping through all the records in the dblk, the entry pointer does not point to the first character of the block time stamp. In valid data blocks, the block time stamp is the first character after the last character of the last record in the dblk.

Explanation of Variable Fields:

aa = DZ11B multiplexer data channel number (00-13 octal).

b = multiplexer port (0-7).

cccccc = pointer (in octal) to first character of message in IAT.

dddddd = pointer (in octal) to first character of billing record currently being processed within the received dblk or message.

eeeeee = pointer (in octal) to first character of block time stamp, which in a valid dblk is the first character after the last character of the last billing record in the dblk.

Trouble Description: Record types or sizes (ie, the record orientation or data) within the dblk is invalid, resulting in an overflow or underflow of characters within the dblk.

Severity of Lost Revenue: Normally no lost revenue since the AMARC signals the CDT for a retransmit of the data. If after a retransmit request, call data is still invalid, the CDT call processing program schedules cancel actions for all CRR's associated with the entire CDT controller. Upon a cancel action, call record data may be discarded and not written on AMA tape; written on tape but MD billed; or written on tape if determined valid.

Trouble Resolution:

Action at the AMARC

Refer to REPT CHL TBL CANCEL SCHEDULED trouble message in this section.

Action at the CDT

Refer to REPT CHL TBL CANCEL SCHEDULED trouble message in this section.

---

tt REPT CHL aab TBL DUPLICATE CDT BLOCKS IGNORED ccc

Explanation of Message: This message is printed whenever AMARC receives three data blocks with the same data stream sequence number in response to consecutive transmit commands. After issuing this report, the system continues to poll normally with a transmit command on this channel.

Explanation of Variable Fields:

aa = DZ11B multiplexer data channel number (00-13 octal).

b = multiplexer port (0-7).

ccc = (bits 0-7) data stream sequence number contained in the data block just received in response to a transmit command. This same sequence number was contained in the last 3 data blocks received in response to the last three transmit commands sent to the CDT controller.

Trouble Description: Three consecutive data blocks with the same data stream sequence number have been received over the primary channel.

Severity of Lost Revenue: Cancel actions may be scheduled. Depending on cancel action treatment, call data may be discarded and not written on AMA tape; written on tape but MD billed; or written on tape if determined valid. If trouble persists for more than 10 minutes and transmit commands are being received by the CDT controller, the CDT controller will reinitialize in an attempt to clear its output buffer. Normal polling will then resume if trouble cleared.

Trouble Resolution:

Action at the AMARC

Verify if this trouble is repeating. Examine printout to see if REPT CHL TBL CANCELED RECEIVED messages are occurring. These messages verify that the CDT controller is reinitializing. If the CDT

controller is not reinitializing, the controller may be malfunctioning. Notify CDT maintenance personnel to verify/correct CDT controller operation. If the CDT controller reinitialization does not clear the trouble, refer to software support for analysis of the message data and evaluation of the trouble condition.

Action at the CDT

When this trouble persists for more than 10 minutes and the CDT controller does not reinitialize, verify correct operation of controller. Perform CDT diagnostics (Section 218-779-301) at the DTP of the associated controller. Analyze results of the diagnostic tests from the alphanumeric display of the DTP and take appropriate corrective action. To analyze results of diagnostic tests and determine corrective action, refer to Sections 218-779-105 and 218-779-106.

---

tt REPT CHL aab TBL ENTRY ccc TIME INTVL ERR dd ee ffffff gggggg

Explanation of Message: This message is printed by CDT call processing whenever a billing entry is being processed and the time interval from the time-of-origin of this billing entry to the time-of-origin of some prior billing entry erroneously shows up as a negative value. In very rare cases, this trouble report could be printed due to a valid condition resulting from processing a very short duration "answered" pulse on a call and experiencing a difference in delays while servicing data from the IAT for a given channel. This valid condition causes the pulse to appear to be of negative duration.

Explanation of Variable Fields:

aa = DZ11B multiplexer data channel number (00-13 octal).

b = multiplexer port (0-7).

ccc = (bits 0-7) invalid record type (rtype) value.

dd = trunk link frame number (00—max tlf no., in decimal).

ee = trunk number (00-95, in decimal).

ff = trouble number identifying the source in the program at which the time interval error was detected.

gggggg = high order 16 bits (in octal) of 32-bit variable containing the invalid time interval value.

hhhhhh = low order 16 bits (in octal) of 32-bit variable containing the invalid time interval value in terms of 1/10ths of seconds. Fields **gggggg** and **hhhhhh** will represent some negative count of 1/10ths of seconds in this trouble report.

Trouble Description: A billing entry is being processed and the time interval from the time-of-orgin of this entry to the time-of-origin of some prior billing entry erroneously shows up as a negative value.

Severity of Lost Revenue: When this short pulse condition occurs, AMARC sets the interval duration to zero and continues normal processing based on a zero duration interval.

Trouble Resolution:

Action at the AMARC

Ignore isolated reports with a small negative interval value. When the time interval value is a large negative value or the trouble repeats, alert CDT maintenance personnel to verify proper CDT controller operation. If no problem exists in CDT controller, refer trouble to software support for resolution.

Action at the CDT

To verify proper operation of CDT controller, perform CDT diagnostics (Section 218-779-301) at the DTP of the associated controller. Analyze results of diagnostic tests from the alphanumerical display of the DTP and take corrective action. To analyze results of diagnostic tests and determine corrective action, refer to Sections 218-779-105 and 218-779-106.

---

tt REPT CHL aab TBL INVAL RTYPE ccc dddddd eeeeee ffffff gg

Explanation of Message: This message is printed whenever an invalid record type (rtype) or invalid record size is detected in a data block (dblk). An invalid rtype or record size can be detected during a prelook through the record(s) of a dblk before processing or later as CDT call processing steps through the billing records to actually do the processing and apply the records to their respective CRRs.

Explanation of Variable Fields:

aa = DZ11B multiplexer data channel number (00-13 octal).

b = multiplexer port (0-7).

ccc = (bits 0-7) invalid rtype.

dddddd = pointer (in octal) to first character of message in IAT.

eeeeee = pointer (in octal) to first character of billing record currently being processed.

ffffff = pointer (in octal) to first character of block time stamp at the end of the data records.

gg = trouble number identifying the source of the trouble.

= 0 = prelook through records in CTDBLKR.C.

= 1 = actual processing of records in CTPDBLK.C.

Trouble Description: An invalid rtype or an invalid record size has occurred in a dblk.

Severity of Lost Revenue: Upon the first occurrence of this trouble, a retransmit command is sent over the CDT channel in an attempt to clear the trouble. If the retransmitted data is still invalid, cancel actions are scheduled for all of the CRRs associated with the CDT controller. Cancel actions may result in call data discarded and not written on AMA tape, written on tape but MD billed, or written on tape if determined valid.

Trouble Resolution:

Action at the AMARC

When this trouble persists, notify CDT maintenance personnel to verify proper operation of CDT controller. If no controller malfunction, refer trouble to software support for analysis of messages and evaluation of the invalid condition.

Action at the CDT

Verify proper operation of CDT controller with CDT diagnostics (Section 218-779-301) at the DTP of the associated CDT controller. Analyze results of diagnostic tests from the alphanumerical display of the DTP and take corrective action. To analyze results of diagnostic tests and determine corrective action, refer to Sections 218-779-105 and 218-779-106.

---

tt REPT CHL aab TBL INVALID BLOCK DATA ccd eee ffff

tt ln: xx xx xx xx xx xx, etc

tt ln: xx xx xx xx xx xx, etc

Explanation of Message: This message indicates that a data block containing invalid data was received from a CDT. The contents of the data block containing the valid data are printed as part of this message.

Explanation of Variable Fields:

aa = DZ11B multiplexer data channel number (00-13 octal).

b = multiplexer port (0-7).

ccd = number of physical channel on which block was received (= **aab** if **ccd** is not a dialup channel).

eee = message type character of received message (in octal).

ffff = count of the number of bytes or characters in the dblk (in decimal) (192 characters max).

ln = line number of received message data being printed.

xx = bcd (hexadecimal) digits representing one character of the data block. The right **x** digit represents bits 0-3 and the left **x** digit represents bits 4-7.

Trouble Description: A data block contains invalid data that is received from a CDT.

Severity of Lost Revenue: When a CDT data block containing invalid data is received at the AMARC, a retransmit of the data block is scheduled. If the data is still invalid, retransmit commands will continue to be sent. These retransmit commands will continue until the CDT reinitializes due to buffer overflow or failure of waiting data blocks to be transmitted while continuous retransmits are received for a time interval. When the CDT controller reinitializes, a cancel record will be generated for the data block.

Trouble Resolution:

Action at the AMARC

When this trouble continues, notify CDT maintenance personnel to verify proper operation of the CDT controller. If no controller malfunction, refer trouble to software support for resolution.

Action at the CDT

Verify proper operation of the CDT controller with diagnostic tests (Section 218-779-301) at the DTP of the associated controller. Analyze results of diagnostic tests from the alphanumeric display of the DTP tests and take appropriate corrective action. To analyze results of diagnostic tests and determine corrective action, refer to Sections 218-779-105 and 218-779-106.

---

tt REPT CHL aab TBL INVALID BLOCK RESPONSE ccd eee ffff ggg

tt ln: xx xx xx xx xx xx, etc

tt ln: xx xx xx xx xx xx, etc

Explanation of Message: This message indicates that a message was received in response to a command for which the message is not a valid response.

Explanation of Variable Fields:

aa = DZ11B multiplexer data channel number (00-13 octal).

b = multiplexer port (0-7).

ccd = number of physical channel on which block was received (= **aab** if **ccd** is not a dialup channel).

eee = message type character of received message (in octal).

ffff = count of the number of bytes or characters in the dblk (in decimal) (192 characters max).

ggg = bits 0-7 represent the message type of the last previous command sent to the CDT.

ln = line number of received message data being printed.

xx = bcd (hexadecimal) digits representing one character of the dblk. The right **x** digit represents bits 0-3 and the left **x** digit represents bits 4-7.

Trouble Description: The message received from the CDT is not a valid response for the command sent from the AMARC.

Severity of Lost Revenue: AMARC will send a retransmit command when this trouble occurs. If the trouble does not clear, retransmit commands will continue until the CDT reinitializes due to buffer overflow or failure of block numbers to advance within a timed interval. When the CDT controller reinitializes, a cancel record will be generated for the data block.

Trouble Resolution:

Action at the AMARC

When this trouble continues, notify CDT maintenance personnel to verify proper operation of the CDT controller. If no controller malfunction, refer trouble to software support for resolution.

Action at the CDT

Verify proper operation of the CDT controller with diagnostic tests (Section 218-779-301) at the DTP of the associated controller. Analyze test results from the alphanumeric display of the DTP and take appropriate corrective action. To analyze results of diagnostic tests and determine corrective action, refer to Sections 218-779-105 and 218-779-106.

---

tt REPT CHL aab TBL ccd SRC A/B DATA STREAM LINK ERR eee f NO MATECHL ggh j k

Explanation of Message: This message is printed when a data stream linkage error exists in the "link" from a primary channel buffer to a source data stream buffer (source A or source B).

Explanation of Variable Fields:

aa = DZ11B multiplexer data channel number (00-13 octal).

b = multiplexer port (0-7).

ccd = number of physical channel on which block was received (= **aab** if **ccd** is not a dialup channel).

eee = bits 0-7 source data stream buffer progress mark which indicates the status of the respective source A or source B data stream.

= 0 = initialized state—data stream is not active.

= 1 = cancelled state—all CRRs associated with this data stream are in a cancelled state.

= 2 = normal state—data stream is alive with billing data flowing normally into CRRs. Some billing data has already been applied to its CRRs.

f = flag in source data stream buffer indicating whether the source is linked to this primary channel.

= 0 = not linked.

= 1 = linked.

ggh = **NO MATECHL** if mate primary channel is not equipped for this CDT controller.

= channel number of mate primary channel if equipped.

j = local channel number (0 or 1) of mate channel.

k = primary channel buffer flag indicating whether the source data stream is linked at the primary channel.

= 0 = not linked.

= 1 = linked.

Trouble Description: A data stream linkage error exists in the "link" from a primary channel to a source data stream buffer. Linkage error conditions are:

- The data stream buffer progress mark indicates billing data has passed through the buffer (implies a flowing data stream) but no channel-to-source linkage is present.
- The data stream buffer progress mark indicates an "initialized" data stream buffer (with no active data stream) but a channel-to-source linkage does not exist in error.
- The primary channel being serviced is not linked to the source buffer. The source buffer progress mark indicates a flowing data stream, and this CDT controller does not have a mate primary channel equipped.

Severity of Lost Revenue: Normally no lost revenue since AMARC attempts to establish the correct linkage to conduct the source data stream conveying the block being processed via the channel being serviced.

Trouble Resolution:

Action at the AMARC

Ignore isolated occurrences. When this trouble repeats, notify CDT maintenance personnel to verify proper operation of the CDT controller. If no controller malfunction, then trouble may represent an AMARC program execution error. Refer trouble to software support when there is possible program execution error.

Action at the CDT

Verify proper operation of the CDT controller with diagnostic tests (Section 218-779-301) at the DTP of the associated controller. Analyze results of diagnostic tests from the alphanumerical display of the DTP and take appropriate corrective action. To analyze results of tests and determine corrective active, refer to Sections 218-779-105 and 218-779-106.

---

tt REPT CHL aab INV IETYPE cc dd eee fff gg h

Explanation of Message: This message is printed when an initial entry (IE) is received with an invalid IETYPE value in the IETYPE data field (bits 4-7 of first character of IE). Valid IETYPE values are given in Table F. Normally this trouble message should never occur.

Explanation of Variable Fields:

aa = DZ11B multiplexer data channel number (00-13 octal).

b = multiplexer port (0-7).

cc = trunk link frame number (in decimal).

dd = trunk number (00-95 in decimal).

eee = (bits 0-3) record type (rtype) value.

fff = bits 0-3 represent the invalid data from the IETYPE field (bits 4-7 of first character) of the IE. (See Table F for valid IETYPE values.)

gg = number (in decimal) of marker in No. 5 crossbar office which set up the call.

h = multiple failure flag

= 0 = no data field failure or only a single data field failure was detected by the CDT controller.

= 1 = more than 1 data field failure was detected by the controller. In this case, when the IETYPE data field is valid, it identifies the most serious (in terms of obstructing valid billing) data field with a failure.

Trouble Description: An IE record is received that contains an invalid IETYPE value in its IETYPE data field (bits 4-7 of first character of IE).

Severity of Lost Revenue: Normally no lost revenue since a retransmit is sent over the data link. If trouble does not clear after the retransmit request, cancel action is scheduled for all CRRs associated with the entire CDT controller. The cancel action may result in call data discarded and not written on AMA tape, written on tape but minimum duration billed, or written on tape after determined valid.

Trouble Resolution:

Action at the AMARC

When this trouble occurs repeatedly for a single CDT controller, notify CDT maintenance personnel to verify proper operation of controller. If no controller malfunction, then possible program execution error exists. Refer trouble to software support personnel.

Action at the CDT

Operation of the CDT controller should be verified. To verify proper operation of controller, perform CDT diagnostics (Section 218-779-301) at the DTP of the associated controller. Analyze results of diagnostic tests from the alphanumerical display of the DTP and take appropriate corrective action. To analyze results of diagnostic tests, determine corrective action; refer to Sections 218-779-105 and 218-779-106.

---

tt REPT CHL aab TBL WRONG BLKNO ccc ddd eee fff

Explanation of Message: This message is printed when a data block is detected with a wrong block sequence number. This trouble indicates that a block of data may have been lost.

Explanation of Variable Fields:

aa = DZ11B multiplexer data channel number (00-13 octal).

b = multiplexer port (0-7).

ccc = bits 0-7 represent the data stream block sequence number from the dblk currently being processed.

ddd = bits 0-7 represent the data stream sequence number saved from the previously received data block in this data stream.

eee = bits 0-7 represent the message type of the last previous command sent to the CDT.

fff = bits 0-7 source data stream buffer progress mark which indicates the status of the respective source A or source B data stream.

= 0 = initialized state—data stream is not active.

= 1 = cancelled state—all CRRs associated with this data stream are in a cancelled state.

= 2 = normal state—data stream is alive with billing data flowing normally into CRRs—some billing data has already been applied to the CRRs.

Trouble Description: Data block received with wrong block sequence number.

Severity of Lost Revenue: Normally, no lost revenue since a retransmit is sent over the data channel. Upon detecting the second occurrence of this trouble (the retransmitted data is still not in sequence), cancel actions are scheduled for all CRRs associated with the entire CDT controller.

Trouble Resolution:

Action at the AMARC

If this trouble persists, it could be a CDT malfunction or a CDT call processing program error. When this trouble persists, notify CDT maintenance personnel to verify proper operation of the CDT controller. If no controller malfunction, refer trouble to software support for resolution.

Action at the CDT

Verify proper operation of CDT controller with diagnostic tests (Section 218-779-301) at the DTP of the associated controller. Analyze diagnostic test results from the alphanumeric display of the DTP and take appropriate corrective action. To analyze results of tests and determine corrective action, refer to Sections 218-779-105 and 218-779-106.

C. CDT Office Troubles

tt REPT CHL aab INV IE DATA cc dd eee fff gg h

Explanation of Message: When the CDT controller detects invalidly coded or missing initial entry (IE) data on the leads it scans from the No. 5 crossbar office, the controller sets a value into the IETYPE data field (bits 4-7 of first character). This value identifies which data field in the IE represents invalid scanned data from the No. 5 crossbar office. For some scanned data failures, the controller will set a default value into the data field of the IE. When the controller detects more than one failure in different sets of scanned leads associated with one IE, it sets the multiple failure flag and places the identity of the most severe (in terms of obstructing billing) failure into the IETYPE data field. This message is printed whenever AMARC detects a value in the IETYPE data field indicating that one or more data fields in the IE contain data resulting from the controllers failure to scan its input data validly.

Explanation of Variable Fields:

aa = DZ11B multiplexer data channel number (00-13 octal).

b = multiplexer port (0-7).

cc = trunk link frame number (in decimal).

dd = trunk number (00-95 in decimal).

eee = (bits 0-3) record type (rtype) value should be = 11 (octal) = 9 in Hex or BCD for an IE.

fff = bits 0-3 represent the data from the IETYPE field (bits 4-7 of first character) of the IE. Valid IETYPE data values and definitions are shown in Table F.

gg = number (in decimal) of marker in No. 5 crossbar office which set up the call.

h = multiple failure flag.

= 0 = no data field failure or only a single data field failure was detected by the CDT controller.

= 1 = more than 1 data field failure was detected by the controller; in this case, the IETYPE data field identifies the most serious (in terms of obstructing valid billing) data field with a failure.

Trouble Description: AMARC detects a value in the IETYPE data field indicating that one or more data fields in the IE contain data resulting from the CDT controller's failure to scan its input data validly.

Severity of Lost Revenue: CDT call processing via the AMARC reports the trouble and then treats the IE with invalid data essentially as if it were an IE with valid data. The call processing program passes, when appropriate, the call onto tape processing for possible formatting. Tape formatting programs will format the call if it can. Otherwise, if the data field failure is one that obstructs billing, the call will be discarded and appropriate tracer counts and output counts will be pegged.

Trouble Resolution:

Action at the AMARC

This trouble indicates a failure in No. 5 crossbar office equipment. When these troubles repeat, and especially when the pattern of data in the reports identifies the failing equipment, alert No. 5 crossbar office craftpersons to remove from service and repair the failing equipment. Refer to Table F and other data fields of trouble message to determine pattern and identify failing equipment.

Action at the CDT

No action required since this is No. 5 crossbar office equipment trouble.

---

tt REPT CHL aab TBL CDT TRK AUD TRD FL

cc dd eeeeee ffffff

ggg hhh iii kkk llll

Explanation of Message: This report is printed whenever a call is seen in a called disconnect state (calling party off-hook and called party on-hook) for an interval greater than a valid timed release disconnect (TRD) interval. An answered call that exceeds a valid time interval arms the TRD. This exceeded valid TRD interval is followed by a return to a called party on-hook state without having seen a trunk circuit release. This audit detects stuck high calling party (S1) scan leads.

Explanation of Variable Fields:

aa = DZ11B multiplexer data channel number (00-13 octal).

b = multiplexer port (0-7).

cc = trunk link frame number (00-max tlf no., in decimal).

dd = trunk number (00-95, in decimal).

eeeeee = high order 16 bits (in octal). (See note.)

ffffff = low order 16 bits (in octal). (See note.)

Note: **eeeeee** and **ffffff** together represent a 32-bit variable containing the time interval that the call was in the CLDDIS state for a period (36 sec) exceeding a valid TRD interval. The value in the 32 bits represents the time interval in 1/10ths of seconds.

ggg = calling office index (COI) of calling customer (in octal).

hhhh = calling customer stations digits (in BCD).

iii = called number NPA (in BCD).

kkk = called number office (ABX) code (in BCD).

llll = called number stations digits (in BCD).

Trouble Description: Trunk circuit release time has exceeded the valid TRD interval for a call.

Severity of Lost Revenue: Further calls via the affected trunk will be prevented until the trunk is repaired.

Action at the AMARC

Notify CDT and CDT office (No. 5 crossbar) maintenance personnel. Inform CDT office maintenance personnel of possible stuck S1 (calling party supervision) lead or affected trunk so that trunk can be made maintenance busy until repaired. Provide information as required from message data fields.

Action at the CDT

Keep informed of affected trunk status by CDT office maintenance personnel.

TABLE C

DATA SET CONTROL READ/WRITE BUFFER REGISTER (DRRWBR)

BIT	DEFINITION
bits 0-4	= Data set address.
bit 5 = 0	= Implies data set in receive mode.
= 1	= Implies data set in transmit mode—clear to send.
bit 6 = 1	= Data terminal ready enable bit.
bit 7	= Not used.
bit 8 = 0	= Data set controller memory cleared.
= 1	= Data set controller normal.
bit 9 = 0	= No request to send enable.
= 1	= Request to send enable.
bit 10 = 0	= Processor not active.
= 1	= Processor active.
bit 11 = 1	= Power disconnect override bit. Overrides the effect of bit 12 of DRRWBR being set in other system.
bit 12 = 1	= Power disconnect bit. Disconnects power (or control of data sets) from other system.
bit 13 = 0	= Otherwise.
= 1	= Major alarm.
bit 14 = 0	= Otherwise.
= 1	= Minor alarm.
bit 15	= Remove both tapes indication (if set).

TABLE D

INPUT ASSEMBLY TABLE CONTROL WORD TABLE

BIT	DEFINITION
bits 0-7	= IAT byte pointer.
bits 8-10	= End-of-block pointer.
11 = 0	= Otherwise.
= 1	= IAT ready.
bit 12 = 0	= Otherwise.
= 1	= Last byte zero.
bits 13-14	= Not used.
bit 15 = 0	= Otherwise.
= 1	= IAT complete.

TABLE E

DATA SET CONTROL READ-ONLY REGISTER (DRIROR)

BIT			DEFINITION
bit	0	= 0	= Odd parity in bits 0-7 of read/write buffer register (DRRWBR).
		= 1	= Even parity in bits 0-7 of read/write buffer register (DRRWBR).
bit	1	= 1	= Request to send image or data terminal ready image (see bit 6 of DRRWBR) from this system.
bit	2		= Request to send image or data terminal ready image other system.
bit	3	= 0	= Processor does not have control of data sets.
		= 1	= Processor does have control of data sets.
bit	4	= 1	= Other processor has control of data sets.
bit	5		= Image of power disconnect bit (bit 12 of DRRWBR).
bit	6		= Image of power disconnect bit from other system (bit 12 in other DRRWBR).
bit	7	= 1	= Clear to send (lines 0-15) ready to transmit.
		= 0	= Data set ready to receive information (lines 0-15).
bit	8	= 1	= Clear to send (lines 16-31) ready to transmit.
		= 0	= Data set ready to receive information (lines 16-31).
bit	9	= 1	= Carrier signal exists (lines 0-15).
		= 0	= No carrier signal exists (lines 0-15).
bit	10	= 1	= Carrier signal exists (lines 16-31).
		= 0	= No carrier signal exists (lines 16-31).
bits	11-14		= Not used.
bit	15		= System number.

TABLE F

IETYPE DATA FIELD VALUES

VALUE (IN OCTAL)	DATA FIELD WITH FAILURE (SEE NOTE)
0	All data fields valid.
1	Subscriber line usage (SLU) data (CDT defaults to SLU = 0).
2	Point-to-point sampled (PPS) data (defaults to PPS = 0).
3	Sampled (CCSA) data (defaults to SMPL = 0).
4	For study only — otherwise nonbillable call (SNB) (defaults to SNB = 0).
5	Complaint or service observed (OBS) data (defaults to OBS = 1).
6	Orig eqpmt nbr (DEN) data.
7	Billing telephone nbr — station dig's (BTN-STN).
10	Billing telephone nbr — calling ofice index (BTN-COI). ***Note:*** For BTN failures 7 or 10 above, the valid OFN will be provided in lieu of the invalid or partial BTN data. When this is done, the OEN flag (bit 7 of fourth character) is set.
11	Called digits — station dig's (CD-STN).
12	Called digits — NPA of ofc code (CD-COD).
13	Orig line class (OLC).
14	L1 translation lead (LT1).

Note: The severity of the data failure increases as the number (VALUE) gets larger.