UNCLASSIFIED

AD 400 615

Reproduced
by the

ARMED SERVICES TECHNICAL INFORMATION AGENCY
ARLINGTON HALL STATION
ARLINGTON 12, VIRGINIA

UNCLASSIFIED

SDC

TM(L)-834/002/00

Milestone 5,Volume 2

Preliminary Operating Procedures

for the Bird Buffer System

5 March 1963

APR 8 1963

TECHNICAL
MEMORANDUM

(TM Series)

ASTIA AVAILABILITY NOTICE

Qualified requesters may obtain
copies of this report from ASTIA.

This document was produced by SDC in performance of contract__AF 19(628)-1648, Space__
Systems Division Program, for Space Systems Division, AFSC.

Milestone 5, Volume 2	SYSTEM
Preliminary Operating Procedures for the Bird Buffer System	DEVELOPMENT
by	CORPORATION
R. J. Scott	2500 COLORADO AVE.
Approved	SANTA MONICA
D. A. Biggar	
5 March 1963	CALIFORNIA

A-1159

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1   The Bird Buffer Program.

The entire group of operational programs contained on the Bird Buffer
Master Tape (herein referred to as the "Bird Buffer Program"), has
essentially two phases of operation: bird-contact and non-bird-
contact. The bird-contact mode begins after a "real time near"
message is received from a site, and any prepass data not previously
sent has been transferred. It continues until the site transmits
either a "fade" or "transmission ending" message. Only those jobs
described under 3.0 will be processed in the bird-contact mode.

Any time which is not bird-contact is defined as non-bird-contact,
regardless of whether or not the Bird Buffer is connected to a site.
Only those jobs described under 2.0 will be processed in the non-
bird-contact mode.

1.1.1   Error Checking.

Error checks are made by the program on each card input. Cards which
are not control cards (i.e., which do not contain double asterisk in
Cols. 1-2) are ignored.

Control cards are logged on the Bird Buffer Printer, then checked
further to determine whether: a non-existent job (Cols. 3-4) has been
requested; the vehicle number (if any) is different from that on the
previous INITIALIZE card; a non-decimal value appears where a decimal
digit is expected; a non-octal value appears where an octal digit is
expected; the tape unit or the printer requested (if any) does not
exist. If any of these conditions are present, the control card is
ignored and the operator is notified by an ERROR IN JOB CARD printout.
The program does not halt. If more cards are in the reader, the next
card will be read in and similarly checked.

1.1.2   Order of Processing.

The Bird Buffer Program will process only one job request at a time.
That is, after a control card which defines a legal job request is
entered, no more control cards will be accepted until that job has
been completed.

1.1.3   Changing Vehicles.

The Bird Buffer is "vehicle-specific;" that is, it identifies with the
vehicle whose number appears on the INITIALIZE card. If data from
another vehicle is to be processed, the Bird Buffer Program must
first be read in from tape before the new INITIALIZE card is entered.
(This may be done by a CLEAR and RUN from zero, since the Bird Buffer
Bootstrap remains in core at all times.)

1.2   Tape Procedures.

1.2.1   Anytime the Bird Buffer is initialized, the tape drives should be set
           up in the following manner:

           a)   Tape Unit 1 - The Bird Buffer Master Tape.

           b)   Tape Unit 2 - The Prepass Tape; or if no Prepass Tape exists, a
                 blank tape.

           c)   Tape Unit 3 - A blank tape.

           d)   Tape Unit 4 - The Recording Tape; or if no Recording Tape exists,
                 a blank tape.

1.2.2   The program determines whether tape units 2 or 4 contain a blank tape
           or a tape with data from the contents of the INITIALIZE card. It is
           essential that the proper INITIALIZE card be entered, since an error
           here could cause a data tape to be written over.

1.2.3   Anytime the Prepass Tape is updated or the Recording Tape is filled,
           the program will switch these tapes to another unit. Hence, once the
           system is cycling, the Prepass Tape, the Recording Tape, and the
           blank tape can be on any combination of tape units 2, 3, and 4. When
           the location of the Prepass Tape or the Recording Tape changes, a
           printout on the Bird Buffer Printer will tell the operator which unit
           the tape was switched to. Write lockout should not normally be
           imposed on units 2, 3, or 4. If a Recording Tape is filled, the
           program will leave the completed tape in the rewind unload position.
           If the Prepass Tape is being updated, but the job cannot be completed
           because of a tape error, the job will be aborted with an appropriate
           error printout. If the Recording Tape is found not ready when its
           status is initially sensed, the program will halt with an appropriate
           printout. If this occurs, a blank tape must be put on the proper unit.
           If the program senses a write parity on the Recording Tape, it will
           give an error printout, but will not halt.

           In general, the operator should always know the condition of the tape
           units from the error or status printouts.

1.3   Card Read Procedures.

1.3.1   When cards are to be placed in the card reader, the following steps
           must be taken:

           a)   Motor Power must be on.

           b)   The Row 12 "0" Chk Disable switch must be on.

           c)   The H —→ BCD and Pack switch must be off.

           d)   The Stop Switch should be on.

           d)   The cards are placed in the card reader upside down and Column 1
                of the card to the left. After the glass cover is put on the
                cards, the Stop Switch should be set off and the card reader
                will read all cards in the hopper. In order to minimize card
                jams and read failures, cards should never be placed in the card
                reader without the Stop Switch on.

1.3.2   If the read was successful, the control card will be logged on the
           Bird Buffer Printer; if it was unsuccessful, the card is not logged
           but CARD READ ERROR is printed. The operator should now put the
           Stop Switch on, remove the cards from the hopper, and examine them to
           determine the cause of the error. Usually, a bent card is responsible,
           and repunching of that card will solve the problem. However, if the
           operator can see nothing wrong with the card, he should make a mental
           note of this, and repeat the operation starting with Step 5.
           Continued errors should be brought to the attention of a CDC engineer.

1.3.3   The operator must be careful when an error occurs, for sometimes the
           card is fed through to the stacker and sometimes not. The last card
           in the stacker should be compared against the Bird Buffer Printer
           output to determine this. It is always necessary to remove any
           remaining cards from the hopper when CARD READ ERROR is printed.
           (This message is printed anytime a card feed failure occurs.) The
           cards may then be put back into the hopper at the operator's
           convenience. The program will not read succeeding cards unless this
           is done.

1.4   STARTING THE BIRD BUFFER PROGRAM.

           This section describes the procedures used for reading the Bird
           Buffer Program into the 160A and beginning operations with it.

1.4.1   Inputs.

           a)   The Bird Buffer Master Tape.
           b)   A paper tape containing the Bird Buffer Bootstrap program.

1.4.2   Operator Actions.

           a)   Make certain that the Bird Buffer Master Tape is on tape unit 1
                and the unit is ready. Also make certain that the Bird Buffer
                Printer is ready.

           b)   Depress the CLEAR switch at the computer console.

           c)   Enter 7700 in the P register.

           d)   Turn on the paper tape reader and set it for seven-level tape.

           e)   Place the Bird Buffer Bootstrap in the reader, raise the LOAD
                switch and place the RUN/STEP switch in the RUN position.

           f)   If there are octal corrector cards or parameters to be read in
                at this time, jump key 1 must be raised and the octals placed in
                the card reader.

           g)   Depress the CLEAR switch and raise the RUN switch. If jump key 1
                was raised, the octals will be read in and the program will begin
                operation. If there are no octals, the program will simply begin
                operation.

1.4.3   Error Conditions and Status Printouts.

           a)   INITIALIZE BB.... This is the normal printout for the program.
                The operator should now initialize the Bird Buffer (see 2.1).

           b)   If octals are being read, the program that reads them in may stop
                reading for two reasons: 1) the card reader is not ready, or
                2) an octal card contains an error in one of the columns. There
                will be no printout for these conditions, but the operator will
                know they have occurred because the computer will stop after the

last RUN setting and before the INITIALIZE BB.... printout. If
the reader is not ready, make it ready and raise the RUN switch.
If there is a card error, correct the card, replace it in the
reader and raise the RUN switch.

2.0 NON-REAL-TIME JOBS

2.1   INITIALIZE.

The Bird Buffer Program requires that an INITIALIZE card be read in
via the 167 card reader prior to operation of any other job. This
card must be inserted twice a day as soon after midnight or noon as
is practical. It may also be entered at any other time the Bird
Buffer Program is in core, to change the date or AM/PM setting.

2.1.1   Tape Usage. Not applicable.

2.1.2   Control Card Format.

Cols.			
1-4	**00	Identifies the card as an INITIALIZE card.
5-6	blank	Always blank.
7-10	VVVV	Contains the vehicle number, in decimal.
11-12	blank	Always blank.
13-20	MM/DD/YY	Contains the present month, day, and year; all decimal, and separated by slashes.
21-22	blank	Always blank.
23-24	AM or PM	Usually indicates whether it is morning or afternoon when the INITIALIZE card is entered. (See 2.1.6.)
25-26	blank	Always blank.
27-28	PT or blank	Indicates whether a new Prepass Tape should be made up for this vehicle. If blank, a Prepass Tape exists. If PT, a new Prepass Tape should be made up (new vehicles only).
29-30	blank	Always blank.
31-32	RT or blank	Indicates whether a new Recording Tape should be made up for this vehicle. If blank, a Recording Tape exists, and will be mounted when needed by the programs. If RT, a Recording Tape should be made up (new vehicles only).

Cols. 33-80   Ignored by the Bird Buffer Program--may be used for further identifying information if desired.

2.1.3   Inputs and Environment.

a)   The only input is the INITIALIZE card.
b)   The Bird Buffer Printer must be ready.
c)   The Bird Buffer Program must be in the computer.

2.1.4   Operator Actions.

a)   Ready the printer if not ready.

b)   Place the control card in the reader and ready the reader. No further action should be necessary.

2.1.5   Error Conditions and Status Printouts.

a)   ERROR IN JOB CARD. This printout indicates an error in at least one column of the control card. These are some possible errors: a non-existent job (Cols. 3-4) has been requested; a non-decimal value appears where a decimal digit is expected. Correct the card and reinitiate the job.

b)   BIRD BUFFER NOT INIT. This printout indicates that a control card has been read in that is not an INITIALIZE card and the system has not yet been initialized. The card should be removed and an INITIALIZE card prepared and fed into the computer via the 167 card reader.

2.1.6   Restrictions.

a)   The month, day, year and AM/PM indicator must be set to correspond with the time to which the data to be processed is related. Normally, this will be the "current" time, since real time operations will be taking place. However, where data is "played back" to the Bird Buffer from storage sources at a tracking station, care must be taken to insure that the above restriction is met.

b)   The INITIALIZE card must be entered at least once every 12 hours to advance the date or AM/PM setting.

2.2   TRANSFER TRK.

             The Bird Buffer Program will transfer to the 1604 any or all tracking
             and vehicle time data on the Recording Tape.

2.2.1   Tape Usage.

             a)   Tape Unit 1 - The Bird Buffer Master Tape.

             b)   The Recording Tape which was used during the pass from which the
                  tracking history is desired should be placed on the tape drive
                  currently designated for the Recording Tape.

2.2.2   Control Card Format.

             Cols. 1-4   **01   Identifies the card as a Transfer Tracking
                                       History card.

                    5-6   blank   Always blank.

                    7-10   VVVV   Contains the number of the vehicle from which
                                       data is to be processed, in decimal.

                    11-12   blank   Always blank.

                    13-16   RRRR   May contain a revolution number or may be left
                             or blank blank. If a revolution number is present, it
                                       indicates the first revolution to be trans-
                                       ferred. If blank, NN passes (see Cols. 23-24)
                                       from the beginning of the tape will be
                                       transferred.

                    17-18   blank   Always blank.

                    19-20   SS or   May contain a site number or may be left blank.
                             blank   If a site number is specified, the Cols. 13-16
                                       must contain a revolution number. This
                                       revolution number and site number together
                                       specify a unique pass, which will be the first
                                       pass processed from the Recording Tape. The
                                       total number of passes processed is determined
                                       by Cols. 23-24.

                    21-22   blank   Always blank.

Cols. 23-24   NN or   May contain the number of passes to be pro-
                blank   cessed, or may be blank. If blank, all passes
                         on tape will be processed, beginning with the
                         pass specified in the previous columns.

25-80   These columns are ignored by the program and
                         may be used for further card identification if
                         desired.

2.2.3   Inputs and Environment.

a)   The only inputs required are the Recording Tape and the control
      card.

b)   The Bird Buffer Program must be in the computer and operating in
      the non-bird-contact mode.

c)   T h e Bird Buffer Printer should be ready at all times.

2.2.4   Operator Actions.

a)   Place the Recording Tape on the proper unit and make the unit
      ready.

b)   Check the Bird Buffer Printer to make certain it is ready.

c)   Place the control card in the reader and make the reader ready.
      No further action should be necessary.

2.2.5   Error Conditions and Status Printouts.

a)   ERROR IN JOB CARD. This printout indicates an error in at least
      one column of the control card. These are some possible errors:
      a non-existent job (Cols. 3-4) has been requested; the vehicle
      number is different from that on the previous INITIALIZE card;
      a non-decimal value appears where a decimal digit is expected.
      Correct the card and reinitiate the job.

b)   BIRD BUFFER NOT INIT. This printout indicates that an INITIALIZE
      card has not been entered since the Bird Buffer Program was
      loaded into core. Initialize the program and reinitiate the job.

c)   ILLEGAL JOB REQUEST. This printout indicates that the Bird
      Buffer Program is operating in the bird-contact mode. Reinitiate
      the job when the program is in the non-bird-contact mode.

d)   READY TAPE UNIT X. This printout occurs when the Recording Tape
     is not ready. X will be the number of the tape unit. The
     program will halt. The tape must be made ready and the RUN/STEP
     switch placed in the RUN position. The program will continue
     from where it halted.

e)   PLACE NEW TAPE ON X. This printout means that the program has
     used all of the data on the Recording Tape but has not processed
     all the data it should. In other words, it expects to find more
     data on another tape. The program will halt to allow the operator
     to replace the tape with the new Recording Tape. After the
     Recording Tape unit is made ready, the RUN/STEP switch should be
     placed in the RUN position. The program will now process the new
     Recording Tape. (If it is desired to terminate the job instead
     of processing an additional Recording Tape, load the A register
     with 7777 and place the RUN/STEP switch in the RUN position.)

f)   READ PARITY TAPE X. This indicates that the computer detected a
     parity while reading the tape. The program will not halt nor
     will record containing the parity be transferred to the 1604.
     The program will, instead, go on to the next record. The
     operator must use his own judgement to determine if the frequency
     of parity occurrence becomes critical.

g)   NO RESPONSE-1604. This indicates that the program is unable to
     establish contact with the 1604 and therefore cannot complete the
     requested transfer. The program will halt. In order to attempt
     the transfer again, the RUN/STEP switch must be placed in RUN
     position. The program will continue from where it halted and
     again attempt to make the transfer.

h)   NOT FOUND. This printout indicates that the data requested on
     the control card was not found on the Recording Tape. Either
     the wrong information has been punched on the card or the wrong
     Recording Tape is on the tape drive.

i)   JOB COMPLETE. This indicates that the job is complete. The
     program will position the Recording Tape at the double end of
     file mark.

j)   1604 TRANSFER ERRS. This printout indicates that there are
     persistent checksum errors in the data being transferred to the
     1604. The record containing the checksum error will be skipped
     and not transferred.

k)   FORMAT ERR TAPE X. This printout means that the first record
     of tape unit X contains either the wrong identification or the
     wrong vehicle number. Correction procedure is as described in
     Section e) above.

2.2.6   Restrictions. The Bird Buffer must be in the non-bird-contact mode.

2.3   TRANSFER PREPASS.

The Bird Buffer Program will transfer prepass data from the 1604 computer to the Prepass Tape.

2.3.1   Tape Usage:

a) Tape Unit 1 - The Bird Buffer Master Tape.

b) Tape Unit 2 - Initially, the Prepass Tape, if one exists; or a blank tape.

c) Tape Unit 3 - Initially, a blank tape. If this is not the first job request then all tape units should remain unchanged from the previous job.

2.3.2   Control Card Format.

Cols.	1-4	**02	Identifies the card as a Transfer Prepass card.
	5-6	blank	Always blank.
	7-10	VVVV	Vehicle number, in decimal.
	11-12	blank	Always blank.
	13-16	RRRR or blank	May contain a revolution number or may be blank. If blank, all prepass data for the specified vehicle will be transferred. If a revolution number is specified, only prepass data for that revolution will be transferred.
	17-18	blank	Always blank.
	19-20	SS or blank	May be blank or may contain a site number. If blank, all prepass data for the specified vehicle will be transferred. If cols. 19-20 contain a site number, only prepass data for that site will be transferred.
	21-80		These columns are ignored by the program and may be used for further card identification if desired.

2.3.3   Inputs and Environment.

    a)   The only inputs required are the Prepass Tape (if one exists), a
        blank tape, and the control card.

    b)   The Bird Buffer must be connected to the proper 1604 computer
        which must be operating in the satellite mode.

    c)   The Bird Buffer Program must be cycling in the non-bird-contact
        mode.

    d)   The Bird Buffer Printer should be operating so it can receive
        receive any error or status printouts.

2.3.4   Operator Actions.

    a)   Insure that the Bird Buffer is connected to the proper 1604
        computer.

    b)   If this is the first job, place the tapes on the proper units and
        make the units ready.

    c)   Check the Bird Buffer Printer to make sure it is ready.

    d)   Place control card in the reader and ready the reader.

    e)   Inspect any printouts on the Bird Buffer Printer to see if the
        job was successfully completed.

2.3.5   Error Conditions and Status Printouts.

    a)   ERROR IN JOB CARD. This printout indicates an error in at
        least one column of the control card. These are some possible
        errors: a non-existent job (cols. 3-4) has been requested;
        the vehicle number is different from that on the previous
        INITIALIZE card; a non-decimal value appears where a decimal
        digit is expected. Correct the card and re-initiate the job.

    b)   BIRD BUFFER NOT INIT. This printout indicates that an INITIALIZE
        card has not been entered since the Bird Buffer Program was
        loaded into core. Initialize the Program and re-initiate the
        job.

    c)   ILLEGAL JOB REQUEST. This printout indicates that the Bird
        Buffer Program is operating in the bird-contact mode. Re-
        initiate the job when the Program is in the non-bird-contact
        mode.

d) READY TAPE UNIT X. This printout occurs if a tape unit that is
being used goes not ready. X will be the number of the tape
unit. The computer will not halt on this condition, and the
job will have to be reinitiated after the tape unit is made
ready.

e) READ PARITY TAPE X. This printout means that a parity occurred
on a tape unit that was being read. X will be the number of the
tape unit. The condition can probably be corrected by moving
the tape to another unit (making sure that the logical tape
number of this drive is altered as well). The computer will
not halt. The job will have to be reinitiated after the error
has been rectified.

f) WRITE PARITY TAPE X. This printout means that a parity occurred
while a record was being written on tape. X will be the number
of the tape unit. This situation can probably be corrected by
replacing the tape. The computer will not halt, and the job
will have to be reinitiated after the error has been corrected.

g) NO RESPONSE - 1604. This printout means that the 1604 computer
did not answer the interrupt from the 160A. The job will have
to be reinitiated after the 1604 computer is available for the
transfer.

h) NO DATA FROM 1604. This printout means that the 1604 computer
has no data of the type requested by the 160A. The job will
have to be reinitiated after this situation is corrected.

i) 1604 TRANSFER ERRS. This printout indicates that there are
persistent checksum errors in the data being transferred from
the 1604. The job will have to be reinitiated after this
equipment malfunction is corrected.

j) 1604 DATA ERROR. This printout indicates that the data received
from the 1604 is of the wrong format. The job will have to be
reinitiated after the cause of this inconsistency is corrected.

k) FORMAT ERR TAPE X. This printout means that the first record
of tape unit X contains either the wrong identification or the
wrong vehicle number. X will be the number of the tape unit.
The job must be reinitiated after the proper prepass tape is
placed on unit X.

l)   JOB COMPLETED. This printout occurs at the completion of the job.
     If the job was successful there will be no error printouts
     preceding this one. If the job was completed unsuccessfully,
     error printouts will precede the JOB COMPLETE printout.

m)   PREPASS TAPE UNIT. This printout states which drive the new
     Prepass Tape is on. X will be the number of the tape unit.
     The tape unit number may be the same as the original unit, or
     it may be different.

2.3.6   Restrictions.

The Bird Buffer Program must be in the non-bird-contact mode of
operation.

2.4   COMMAND HISTORY.

The Bird Buffer Program will, on request, give a time-sequenced printout of all Command Operational Status Reports recorded on magnetic tape during a particular pass.

2.4.1   Tape Usage.

a)   Tape Unit 1 - The Bird Buffer Master Tape.

b)   Tape Unit 4 - The Recording Tape which was used during the pass from which the command history is desired.

2.4.2   Control Card Format.

Cols.	1-4	**03	Identifies the card as a Command History card.
	5-6	blank	Always blank.
	7-10	VVVV	Contains the number of the vehicle from which data is to be processed.
	11-12	blank	Always blank.
	13-16	RRRR or blank	May be blank or may contain a revolution number. If a revolution number appears, it will be the first revolution on the tape to be processed. If blank, NN passes (see Cols. 23-24) from the beginning of the tape will be processed.
	17-18	blank	Always blank.
	19-20	SS or blank	May contain a site number or may be blank. If a site number is specified, then Cols. 13-16 must contain a revolution number. Cols. 13-16 and 19-20 together specify a unique pass. This pass will be the first pass processed from the Recording Tape. The total number of passes processed is determined by Cols. 23-24.
	21-22	blank	Always blank.
	23-24	NN or blank	May contain the number of passes to be processed or may be left blank. If blank, all passes on tape beginning with the pass specified in the previous columns will be processed.

Cols. 25   blank   Always blank.

26   P   Must always have one of the following numbers
                       corresponding to the printer or printers on
                       which the history is to be put out. (Anything
                       printed on the Data Analysis Printer will also
                       appear on the Multi-ops Printer.)

                       1 = Data Analysis (DA)
                       2 = Data Presentation (DP)
                       3 = DA and DP
                       4 = Bird Buffer (BB)
                       5 = DA and BB
                       6 = DP and BB
                       7 = DA, DP and BB

27-80   These columns are ignored by the program and
                       may be used for further card identification if
                       desired.

2.4.3   Inputs and Environment.

a)   The only inputs required are the Recording Tape and the control
      card.

b)   The printer(s) which are to receive the output should be ready to
      operate.

c)   The Bird Buffer Program must be in the computer and operating in
      the non-bird-contact mode.

d)   The Bird Buffer Printer should be ready at all times.

2.4.4   Operator Actions.

a)   Place the tapes on the proper drives and make them ready.

b)   Check all printers to be used and make certain they are ready.

c)   Place the control card in the reader and ready the reader. No
      further action should be necessary.

2.4.5   Error Conditions and Status Printouts.

a)   ERROR IN JOB CARD. This printout indicates an error in at least
     one column of the control card. These are some possible errors:
     a non-existent job (Cols. 3-4) has been requested; the vehicle
     number is different from that on the previous INITIALIZE card;
     a non-decimal value appears where a decimal digit is expected;
     the printer requested does not exist. Correct the card and
     reinitiate the job.

b)   BIRD BUFFER NOT INIT. This printout indicates that an INITIALIZE
     card has not been entered since the Bird Buffer Program was
     loaded into core. Initialize the program and reinitiate the job.

c)   ILLEGAL JOB REQUEST. This printout indicates that the Bird
     Buffer Program is operating in the bird-contact mode. Reinitiate
     the job when the program is in the non-bird-contact mode.

d)   ERROR PRINTER X. If any printer other than the Bird Buffer Printer
     is initially not ready, or goes not ready during the job, this
     printout will occur on the Bird Buffer Printer. X is the number
     of the printer in error (see paragraph 3.8). The program will
     halt. The printer should be made ready and the RUN/STEP switch
     placed in the RUN position. The program will continue from
     where it halted.

e)   READY TAPE UNIT X. This printout occurs when the Recording Tape
     is not ready. X will be the number of the tape unit. The program
     will halt. The tape must be made ready and the RUN/STEP switch
     placed in the RUN position. The program will continue from
     where it halted.

f)   PLACE NEW TAPE ON X. This printout means that the program has
     used the last of the data on the tape but has not processed all
     the data it should. In other words, it expects to find more data
     on another tape. The program will halt to allow the operator to
     replace the tape with the new Recording Tape. After the new tape
     is made ready, the RUN/STEP switch should be placed in the RUN
     position. The program will not process the new Recording Tape.

g)   READ PARITY TAPE X. This indicates that the computer detected
     a parity while reading the tape. The program will halt. If the
     RUN/STEP switch is placed in the RUN position, the record
     containing the parity will be ignored and the program will read
     the next record. The operator must use his own judgement to
     determine if the record containing the parity contained critical
     data.

h) NOT FOUND. This printout indicates that the data requested was
    not found on the tape mounted.

i) JOB COMPLETE. This printout means that the job is complete.

j) If the program halts at location 1504 and gives no printout, it
    is because the Bird Buffer Printer is not ready. The printer
    should be made ready and the RUN/STEP switch placed in the RUN
    position. The program will continue from where it halted.

k) If the program appears to be operating and no printout of data or
    status or alarm messages occurs, it is because the printers
    selected for printing are not connected to the computer but are
    represented by the phantom resume circuit. The program must be
    allowed to continue until it is finished with its operation.
    The end of the operation will be apparent when the recording
    tape is not moved for 30 seconds. At this time, the specified
    printers must be connected to the Bird Buffer computer and the
    job reinitiated. There is no reason to halt the computer.

2.4.6   Restrictions. The Bird Buffer Program must be in the non-bird-contact
        mode.

2.5   MERGE TAPE

The Bird Buffer Program will merge data from a Telemetry Mode Tape onto the Prepass Tape.

2.5.1   Tape Usage.

a)   Tape Unit 1 - The Bird Buffer Master Tape.

b)   Tape Unit 2 - Initially, the Bird Buffer Prepass Tape, if one exists; or a blank tape.

c)   Tape Unit 3 - Initially, a blank tape.

d)   Tape Unit 4 - Initially, the Telemetry Mode Tape to be merged.

If this is not the initial job request, the Telemetry Mode Tape should be placed on the unit which currently contains the Recording Tape.

2.5.2   Control Card Format.

Cols. 1-4   **04   Identifies the card as a Merge Tape card.

       5-6   blank   Always blank.

       7   T   T is the logical tape unit that the Telemetry Mode Tape is on.

       8-80   These columns are ignored by the program and may be used for further card identification if desired.

2.5.3   Inputs and Environment.

a)   The inputs required are the Prepass Tape (if one exists), the Telemetry Mode Tape, a blank tape, and the control card.

b)   The Bird Buffer program must be cycling in the non-bird-contact mode.

c)   The Bird Buffer Printer should be operating so it can receive any error or status printouts.

2.5.4   Operator Actions.

a)   Insure that the Telemetry Mode Tape is on the proper drive, and that all tapes are ready.

    b)   Ready the Bird Buffer Printer if it is not ready.

    c)   Place the control card in the reader, and ready the reader.

    d)   Inspect any printouts on the Bird Buffer Printer to see if the job was successfully completed.

2.5.5   Error Conditions and Status Printouts.

    a)   ERROR IN JOB CARD. This printout indicates an error in at least one column of the control card. These are some possible errors: a non existent job (cols. 3-4) has been requested; a non-decimal value appears where a decimal digit is expected; the tape unit requested does not exist. Correct the card and re-initiate the job.

    b)   BIRD BUFFER NOT INIT. This printout indicates that an INITIALIZE card has not been entered since the Bird Buffer Program was loaded into core. Initialize the Program and re-initiate the job.

    c)   ILLEGAL JOB REQUEST. This printout indicates that the Bird Buffer Program is operating in the bird-contact mode. Re-initiate the job when the Program is in the non-bird-contact mode.

    d)   READY TAPE UNIT X. This printout occurs if a tape unit that is being used goes not ready. X will be the number of the tape unit. The computer will not halt on this condition, and the job will have to be reinitiated after the tape unit is made ready.

    e)   READY PARITY TAPE X. This printout means that a parity occurred on a tape unit that was being read. X will be the number of the tape unit. The condition can probably be corrected by moving the tape to another unit (making sure that the logical tape number of this drive is altered as well). The computer will not halt. The job will have to be reinitiated after the error has been rectified.

    f)   WRITE PARITY TAPE X. This printout means that a parity occurred while a record was being written on a tape. X will be the number of the tape unit. This situation can probably be corrected by using a different blank tape. The computer will not halt, and the job will have to be reinitiated after the error has been corrected.

    g)   FORMAT ERR TAPE X. This printout means that the first record of tape unit X contains either the wrong identification or the wrong vehicle number. X will be the number of the tape unit. The job will have to be reinitiated after the proper tape is placed on unit X.

h) JOB COMPLETE. This printout occurs at the completion of the job. If the job was successful there will be no error printouts preceding this one. If the job was completed unsuccessfully, error printouts will precede the JOB COMPLETE printout.

i) PREPASS TAPE UNIT X. This printout states which drive the new Prepass Tape is on. X will be the number of the tape unit. The tape unit number may be the same as the original unit, or it may be different.

2.5.6   Restrictions.

The Bird Buffer Program must be in the non-bird-contact mode.

2.6   CONTACT SITE.

The Bird Buffer Program will initiate contact with the designated tracking station.

2.6.1   Tape Usage.

a)   Tape Unit 1 - The Bird Buffer Master Tape.

b)   Tape Unit 2 - Prepass Tape for the requested station, if any, or blank.

c)   Tape Unit 3 - Blank tape used for updating the Prepass Tape or as an alternate Recording Tape.

d)   Tape Unit 4 - Vehicle Recording Tape or blank.

2.6.2   Control Card Format.

Cols.			
1-4	**05	Identifies the card as a Contact Site request.	
5-6	blank	Always blank.	
7-10	VVVV	Contains the number of the vehicle from which data is to be processed.	
11-18	blank	Always blank.	
19-20	SS	Contains the number of the site to be contacted.	
21-80		These columns are ignored by the program and may be used for further card identification if desired.	

2.6.3   Inputs and Environment.

a)   The only inputs required are the tapes as specified above, and the control card.

b)   Jump Key 2. This key is interrogated by the Bird Buffer if the tracking station does not respond to the hello message after five attempts or if the station responds with a misconnection or busy reply. If the key is not set, the program, after printing the appropriate message, will continue to transmit "hello"

messages if the first condition is true. If the key is set, the
program halts with 0077 in the accumulator. The cycle for the
first condition can be reinitiated by pressing the run key on the
console. See 2.6.5, f) for the result of the latter condition.

c)   Jump Key 4. This key is interrogated when an error is detected
     in conjunction with the Bird Buffer Printer. If the key is set,
     the program continues and an attempt will be made to print again
     after a time delay. If the key is not set, stop key 4 is
     interrogated; see 2.6.3, d).

d)   Stop Key 4. This key is interrogated after detecting an error in
     the Bird Buffer Printer if jump key 4 is not set. If the key is
     set, the program halts with 0053 in the accumulator. Activation
     of the run key will cause the program to examine the status of
     the printer immediately and to print if possible. If an error is
     still encountered, the process described in 2.6.3, c) and d), is
     repeated.

2.6.4   Operator Actions.

a)   Mount the specified tapes.
b)   Make appropriate jump/stop key settings desired.
c)   Enter the control card. No further action should be necessary.

2.6.5   Error Conditions and Status Printouts.

a)   Bird Buffer Printer error. See 2.6.3, c) and d).

b)   UNABLE TO CONTACT TS. This message is printed if no response
     is received from the station after five "hello" transmissions.
     See 2.6.3, b) for recovery procedure.

c)   CCC DISCONNECTED. This message is printed if a phantom resume
     status response is detected upon selection of the CCC. The
     switch connection should be examined and hookup made if possible.
     The program will not halt, but the CCC is cyclically interro-
     gated to initiate message transmission.

d)   IN CONTACT SITE X. This message is printed when the station has
     been successfully contacted. X will be the station number.

e)   MISCONNECTION SENT. This message is printed if the station
     response contains a vehicle number or site code different from
     the data entered on the control card. A misconnection message is
     also sent to the tracking station.

f) MISCONNECTION/BUSY REPLY. This message is printed when the station does not respond or responds with a message indicating misconnection or busy status. The status of jump key 2 determines whether the program will halt. If the halt is activated, the value 0077 is in the accumulator. Further attempts to contact the station will not be made unless the control card is again entered.

g) ERROR IN JOB CARD. This printout indicates an error in at least one column of the control card. These are some possible errors: a non-existent job (Cols. 3-4) has been requested; the vehicle number is different from that on the previous INITIALIZE card; a non-decimal value appears where a decimal digit is expected. Correct the card and reinitiate the job.

h) BIRD BUFFER NOT INIT. This printout indicates that an INITIALIZE card has not been entered since the Bird Buffer Program was loaded into core. Initialize the program and reinitiate the job.

i) ILLEGAL JOB REQUEST. This printout indicates that the Bird Buffer Program is operating in the bird-contact mode. Reinitiate the job when the program is in the non-bird-contact mode.

2.6.6   Restrictions. The Bird Buffer Program must be in the non-bird-contact mode.

2.7   SEND PREPASS

The Bird Buffer Program will transmit to a site all prepass data not previously sent to that site.

2.7.1   Tape Usage.

a)   Tape Unit 1 - The Bird Buffer Master Tape.
b)   Tape Unit 2 - Initially, the Bird Buffer Prepass Tape.
c)   Tape Unit 3 - Initially, a blank tape.

If this is not the initial job request, then all tape units should remain unchanged from the previous job.

2.7.2   Control Card Format.

Cols. 1-4   **06   Identifies the card as a Send Prepass card.

       5-80   These columns are ignored by the program and may be used for further card identification if desired.

2.7.3   Inputs and Environment.

a)   The only inputs required are the Prepass Tape, a blank tape, and the control card.

b)   The Bird Buffer must already be connected to the tracking station that is to receive the data.

c)   The Bird Buffer Program must be cycling in the non-bird-contact mode.

d)   The Bird Buffer Printer should be operating so it can receive any error or status printouts.

2.7.4   Operator Actions.

a)   Insure that the Bird Buffer is already connected to the tracking station.

b)   If this is the initial job, place the tapes on the proper drives and make them ready.

    c)   Check the Bird Buffer Printer and make sure it is ready.

    d)   Place control card in the reader.

    e)   Inspect any printouts on the Bird Buffer Printer to see if the job was successfully completed.

2.7.5   Error Conditions and Status Printouts.

    a)   ERROR IN JOB CARD. This printout indicates that a non-existent job (cols. 3-4) has been requested. Correct the card and reinitiate the job.

    b)   BIRD BUFFER NOT INIT. This printout indicates that an INITIALIZE card has not been entered since the Bird Buffer Program was loaded into core. Initialize the Program and reinitiate the job.

    c)   ILLEGAL JOB REQUEST. This printout indicates that the Bird Buffer Program is operating in the bird-contact mode. Re-initiate the job when the program is in the non-bird-contact mode.

    d)   READY TAPE UNIT X. This printout occurs if a tape unit that is being used goes not ready. X will be the number of the tape unit. The computer will not halt on this condition, and the job will have to be reinitiated after the tape unit is made ready.

    e)   READ PARITY TAPE X. This printout means that a parity occurred on a tape unit that was being read. X will be the number of the tape unit. The condition can probably be corrected by moving the tape to another unit (making sure that the logical tape number of this drive is altered as well). The computer will not halt, and the job will have to be reinitiated after the error has been rectified.

    f)   WRITE PARITY TAPE X. This printout means that a parity occurred while a record was being written on a blank tape. X will be the number of the tape unit. This situation can probably be corrected by using a different blank tape. The computer will not halt, and the job will have to be reinitiated after the error has been corrected.

g) FORMAT ERR TAPE X. This printout means that the first record of tape unit X contains either the wrong identification or the wrong vehicle number. X will be the number of the tape unit. The job will have to be reinitiated after the proper Prepass Tape is placed on unit X.

h) JOB COMPLETE. This printout occurs at the completion of the job. If the job was successful there will be no error printouts preceding this one. If the job was completed unsuccessfully, error printout will precede the JOB COMPLETE printout.

i) PREPASS TAPE UNIT X. This printout states which drive the new prepass tape is on. X will be the number of the tape unit.

j) PREPASS DATA SENT. This printout indicates that all new prepass data have been successfully transmitted to the station.

k) VALIDITY LOW CCC OUT. This printout means that the tracking station is receiving data with persistent parities. This equipment malfunction will have to be rectified before the job can be successfully completed.

l) VALIDITY LOW CCC IN. This printout means that the STA is receiving data with persistent parities. This equipment malfunction will have to be rectified before the job can be successfuly completed.

2.7.6   RESTRICTIONS.

The Bird Buffer Program must be in the non-bird-contact mode.

2.8   TRANSFER CARD PREPASS

Certain types of prepass data may be merged on the prepass tape without the necessity of hooking the Bird Buffer to the 1604. This data will be punched on cards and input directly into the Bird Buffer through the 167 card reader, following the control card described below.

2.8.1 Tape Usage:

a) Tape Unit 2 - Initially, the Prepass Tape.

b) Tape Unit 3 - Initially, a blank tape.

2.8.2 Control Card Format:

Cols.			
	1-4	**07	Indicates that card prepass data is to be merged on the Prepass Tape.
	5-6	blank	Always blank.
	7-10	VVVV	Vehicle number, in decimal.
	11-12	blank	Always blank.
	13-16	RRRR	Revolution number, in decimal to the nearest tenth (no decimal point).
	17-18	blank	Always blank.
	19-20	SS	Site code, in decimal.
	21-22	blank	Always blank.
	23	T	T = Type of prepass data cards which follow this card:

> 1 = commands,
>
> 2 = text,
>
> 3 = telemetry mode selection,
>
> 4 = TRK sampling rate,
>
> 5 = scheduling, and
>
> 6 = latitude crossing.

24-80		These columns are ignored by the Bird Buffer Program, and may be used for further card identification if desired.

2.8.3   Inputs and Environment:

a)   The Bird Buffer Program must be cycling in the non-bird-contact
     mode of operation.

b)   The inputs required are the Prepass Tape, a blank tape, and the
     control card.

2.8.4   Operator Actions:

a)   Ready the printer if not ready.

b)   Load and ready the Prepass Tape on tape unit 2, and a blank tape
     on tape unit 3.

c)   Place the card deck (described below) in the card reader, and ready
     the reader. No further action should be necessary.

2.8.5   Error Conditions and Status Printouts:

a)   There are no program halts.

b)   ERROR IN JOB CARD. This printout indicates an error in at least
     one column of the control card. These are some possible errors:
     the vehicle number is different from that on the previous INITIALIZE
     card; a non-decimal value appears where a decimal digit is expected.
     Correct the card and re-initiate the job.

c)   BIRD BUFFER NOT INIT. This printout indicates that an INITIALIZE
     card has not been entered since the Bird Buffer Program was
     loaded into core. Initialize the Program and re-initiate the job.

d)   ILLEGAL JOB REQUEST. This printout indicates that the Bird Buffer
     Program is operating in the bird-contact mode. Reinitiate the job
     when the Program is in the non-bird-contact mode.

e)   READY TAPE UNIT X. This printout indicates that a tape unit being
     used is not ready. X is the number of the tape unit. Ready the
     unit and reinitiate the job.

f)   READ PARITY TAPE X. This printout means that a parity occurred on
     a tape that was being read. X is the tape unit number. Move the
     tape to another unit and reinitiate the job.

g)   WRITE PARITY TAPE X. This printout means that a parity occurred
     during a tape write operation. X is the number of the tape unit.
     Mount a new tape on the unit and reinitiate the job.

h) FORMAT ERR TAPE X. This printout means that the first record of
    the tape contains either the wrong identification or the wrong
    vehicle number. X is the number of the tape unit. Place the
    proper tape on unit X and reinitiate the job.

i) PREPASS TAPE UNIT X. This printout indicates where the new prepass
    tape is now located. X is the number of the tape unit. The unit
    may be the same as the original unit, or it may be a different one.

j) NO END CARD FOUND. This printout signals that an unexpected control
    card was encountered by the Program before an END card (**99) was
    found.

2.8.6   Restrictions

a) The card deck must be set up in the following manner: The first
    card must be a control card as described above indicating what
    prepass data is to follow. The data itself may be contained on
    any number of cards following this card. When the revolution
    number, site code, or type of data changes, a preceding control
    card must specify the change. The final card of the deck is an
    END card (**99). This causes the Bird Buffer to cease looking
    for prepass data, and to wrap up the job.

b) The Bird Buffer must be in non-bird-contact mode.

2.9   TRANSFER SCHOPS.

The Bird Buffer Program will, on request, transfer SCHOPS data from
the 1604 computer to the Prepass Tape or directly to a tracking station.

2.9.1   Tape Usage.

a)   Tape Unit 1 - The Bird Buffer Master Tape.

b)   Tape Unit 2 - Initially, the Bird Buffer Prepass Tape, if the
     data is not being sent directly to a site.

c)   Tape Unit 3 - Initially, a blank tape, if the data is not being
     sent directly to a site.

d)   If this is not the first job request, then all tape units should
     remain unchanged from the previous job.

2.9.2   Control Card Format.

Cols. 1-4   **08   Identifies the card as a TRANSFER SCHOPS card.

       5-18   blank   Always blank.

       19-20   SS   Contains the site number to which the transfer
                          is to be made.

       21-80   These columns are ignored by the program and
                          may be used for further card identification if
                          desired.

2.9.3   Inputs and Environment.

a)   The only inputs required are the control card and, if the data
     is being transferred to tape, the Prepass Tape and a blank tape.

b)   The Bird Buffer must be connected to the proper 1604 computer
     which must be operating in the satellite mode.

c)   If the Bird Buffer is scheduled to send the data directly to the
     site, then it must already be connected to, and in contact with,
     the site. This may require that the CONTACT SITE job be
     requested before this job is requested.

d)   The Bird Buffer Program must be cycling in the non-bird-contact
     mode.

e) The Bird Buffer Printer should be operating so it can receive any
    error or status printouts.

2.9.4   Operator Actions.

a) Insure that the Bird Buffer is connected to the proper 1604
    computer.

b) If this is the initial job, place the tapes on the proper drives
    and make them ready.

c) If the data is to be sent directly to a station, insure that the
    Bird Buffer is properly connected to the station.

d) Check the Bird Buffer Printer to make sure it is ready.

e) Place control card in reader and ready the reader.

f) Inspect any printouts on the Bird Buffer Printer to see if the
    job was successfully completed.

2.9.5   Error Conditions and Status Printouts.

2.9.5.1   If data is being transferred to the Prepass Tape:

a) ERROR IN JOB CARD. This printout indicates an error in at least
    one column of the control card. Some possible errors include:
    a non-existent job (Cols. 3-4) has been requested; a non-decimal
    value appears where a decimal digit is expected. Correct the
    card and reinitiate the job.

b) BIRD BUFFER NOT INIT. This printout indicates that an INITIALIZE
    card has not been entered since the Bird Buffer Program was
    loaded into core. Initialize the program and reinitiate the job.

c) ILLEGAL JOB REQUEST. This printout indicates that the Bird
    Buffer Program is operating in the bird-contact mode. Reinitiate
    the job when the program is in the non-bird-contact mode.

d) NO RESPONSE-1604. This printout means that the 1604 computer did
    not answer the interrupt from the 160A. The job will have to be
    reinitiated after the 1604 computer is available for the transfer.

e) NO DATA FROM 1604. This printout means that the 1604 computer has no data of the type requested by the 160A. The job will have to be reinitiated after this situation is corrected.

f) 1604 TRANSFER ERRS. This printout indicates that there are persistent checksum errors in the data being transferred from the 1604. The job will have to be reinitiated after this equipment malfunction is corrected.

g) 1604 DATA ERROR. This printout indicates that the data received from the 1604 is of the wrong format. The job will have to be reinitiated after the cause of this inconsistency is corrected.

h) FORMAT ERR TAPE X. This printout means that the first record of tape unit X contains either the wrong identification or the wrong vehicle number. X will be the number of the tape unit. The job will have to be reinitiated after the proper Prepass Tape is placed on unit X.

i) READY TAPE UNIT X. This printout occurs if a tape unit that is being used goes not ready. X will be the number of the tape unit. The computer will not halt on this condition and the job will have to be reinitiated after the tape unit is made ready.

j) READ PARITY TAPE X. This printout means that a parity occurred on a tape unit that was being read. X will be the number of the tape unit. The condition can probably be corrected by moving the tape to another unit (making sure that the logical tape number of the drive is altered as well). The computer will not halt. The job will have to be reinitiated after the error has been rectified.

k) WRITE PARITY TAPE X. This printout means that a parity occurred while a record was being written on a blank tape. X will be the number of the tape unit. This situation can probably be corrected by using a different blank tape. The computer will not halt, and the job will have to be reinitiated after the error has been corrected.

l) JOB COMPLETE. This printout occurs at the completion of the job. If the job was successful there will be no error printouts preceding this one. If the job was completed unsuccessfully, error printouts will precede the JOB COMPLETE printout.

m) PREPASS TAPE UNIT X. This printout states which drive the new Prepass Tape is on. X will be the number of the tape unit.

2.9.5.2   If data is being transferred directly to a site.

a)   ERROR IN JOB CARD. This printout indicates an error in at least
     one column of the control card. These are some possible errors:
     a non-existent job (Cols. 3-4) has been requested; a non-decimal
     value appears where a decimal digit is expected. Correct the
     card and reinitiate the job.

b)   BIRD BUFFER NOT INIT. This printout indicates that an INITIALIZE
     card has not been entered since the Bird Buffer Program was
     loaded into core. Initialize the program and reinitiate the job.

c)   ILLEGAL JOB REQUEST. This printout indicates that the Bird
     Buffer Program is operating in the bird-contact mode. Reinitiate
     the job when the program is in the non-bird-contact mode.

d)   NO RESPONSE-1604. This printout means that the 1604 computer did
     not answer the interrupt from the 160A. The job will have to be
     reinitiated after the 1604 computer is available for the transfer.

e)   VALIDITY LOW CCC OUT. This printout means that the tracking
     station is receiving data with persistent parities. This
     equipment malfunction will have to be rectified before the job
     can be successfully completed.

f)   VALIDITY LOW CCC IN. This printout means that the STA is
     receiving data with persistent parities. This equipment mal-
     function will have to be rectified before the job can be
     successfully completed.

g)   NO DATA FROM 1604. This printout means that the 1604 computer
     has no data of the type requested by the 160A. The job will have
     to be reinitiated after this situation is corrected.

h)   1604 TRANSFER ERRS. This printout indicates that there are
     persistent checksum errors in the data being transferred from the
     1604. The job will have to be reinitiated after this equipment
     malfunction is corrected.

i)   1604 DATA ERROR. This printout indicates that the data received
     from the 1604 is of the wrong format. The job will have to be
     reinitiated after the cause of this inconsistency is corrected.

j)   JOB COMPLETE. This printout occurs at the completion of the job.
     If the job was successful there will be no error printouts
     preceding this one. If the job was completed unsuccessfully,
     error printouts will precede the JOB COMPLETE printout.

        k)   **PREPASS DATA SENT.** This printout indicates that the SCHOPS data
              was successfully sent to the station.

2.9.6   **Restrictions.** The Bird Buffer Program must be in the non-bird-contact
        mode.

2.10   SEND TEXT.

A text message may be printed on the STA printers (or sent to a site
computer to which the Bird Buffer is connected) regardless of the
mode of operation. See 3.5.

3.0 REAL-TIME JOBS

3.1 RESTART.

The Restart card will cause the Bird Buffer Program to be brought up
in the bird-contact mode of operation. It is used when the system
halts due to a malfunction in real time, or when it must be restarted
for operational reasons.

3.1.1 Tape Usage.

- a) Tape Unit 1 - The Bird Buffer Master Tape.
- b) Tape Unit 2 - The Prepass Tape.
- c) Tape Unit 4 - A blank tape for recording.

3.1.2 Control Card Format.

Cols. 1-4   **20   Identifies the card as a Restart card.

      5-6   blank   Always blank.

      7-10   MMMM   Contains the number identifying the Telemetry
                         Mode being used during this pass.

      11-80   These columns are ignored by the program and
                         may be used to further identify the card if
                         desired.

3.1.3 Inputs and Environment.

- a) The Bird Buffer Program must be in the computer and the printout,
  INITIALIZE BB... must appear on the Bird Buffer Printer prior to
  entering the RESTART card.

- b) Contact with the remote station must be in effect, i.e., the
  Bird Buffer must be connected to the station.

3.1.4 Operator Actions.

- a) Make certain all equipment is ready.
- b) Place the control card in the card reader and ready the reader.
- c) Be prepared to follow the RESTART card with an INITIALIZE card.

3.1.5   Error Conditions and Status Printouts.

ERROR IN JOB CARD. This printout indicates an error in at least one
column of the control card. These are some possible errors: a non-
existent job (Cols. 3-4) has been requested; a non-decimal value
appears where a decimal digit is expected. Correct the card and
reinitiate the job.

3.1.6   Restrictions.

a)   The Bird Buffer must be in the bird-contact mode.
b)   An INITIALIZE card must follow the RESTART card.

3.2   CHANGE TRK RATE

In the bird-contact mode (during a pass), the Bird Buffer Program will accept a card which causes a message to be sent to the remote station that effects a change in the reported tracking data. The card may contain information which will (1) change the rate at which tracking data is being reported, (2) change the antennae which are being used for tracking, or (3) suppress or re-activate reporting from one or two antennae.

3.2.1   Tape Usage. Not applicable.

3.2.2   Control Card Format.

Cols.	1-4	**21	Identifies the card as a Change Track Rate card.
	5-6	blank	Always blank.
	7-8	TT	Contains the number of seconds between reports as a power of two. These columns must always contain the reporting rate even if the rate is not being changed. Following is a list of the values for cols. 7 and 8, and the corresponding reporting rates:

Col 7-8	Track Data Reporting Rate	
00	1 second	between reports
01	2	"
02	4	"
03	8	"
04	16	"
05	32	"
06	64	"
07	128	"
08	256	"
09	512	"
10	1024	"
11	2048	"

9-10	blank	Always blank.
11-12	ZZ	Identification number of the first or primary antenna. Once an antenna is made the primary antenna, its identification number should not appear in the position of the second antenna in later messages. Zeroes indicate that this antenna is to be or has been suppressed.
13-14	blank	Always blank.
15-16	WW	Identification number of the second antenna. Zeroes indicate that this antenna is to be or has been suppressed.
17-18		These columns are ignored by the program, and can be used for further card identification if desired.

3.2.3   Card Options.

a)   If the reporting rate only is to be changed, the new rate will be in cols. 7-8 and cols. 11-12 and 15-16 will contain the antenna identifications.

b)   If reporting from one or both antennae is to be suppressed, cols. 7-8 will contain the present reporting rate, and those columns corresponding to the antenna to be suppressed will contain zeroes.

3.2.4   Sample Cards.

a)   Change reporting rate for antennas 2 and 5 to 16 sec.

Col.	1234	7-8	11-12	15-16
	**21	04	02	05

b)   Suppress reporting from second antenna but do not change the reporting rate (from 16 sec.) for the first antenna.

Col.	1234	7-8	11-12	15-16
	**21	04	02	00

3.2.5   Inputs and Environment.

a)   The Bird Buffer Program must be in the bird-contact mode of
      operation.

b)   The only input is the control card.

3.2.6   Operator Actions.

a)   Ready the Bird Buffer Printer if not ready.

b)   Place the control card in the reader and ready the reader.
      No further action should be required.

3.2.7   Error Conditions and Status Printouts.

a)   ERROR IN JOB CARD. This printout indicates an error in at
      least one column of the control card. These are some of
      the possible errors: a non-existent job (cols. 3-4) has
      been requested; a non-decimal value appears where a decimal
      digit is expected. Correct the card and reinitiate the job.

b)   BIRD BUFFER NOT INIT. This printout indicates that an
      INITIALIZE card has not been entered since the Bird Buffer
      Program was loaded into core. Initialize the Program and
      reinitiate the job.

c)   ILLEGAL JOB REQUEST. This printout indicates that either
      the Bird Buffer Program is not in bird-contact mode, or
      that the Bird Buffer is not hooked to the tracking computer
      at the site, or both. Reinitiate the job when the computer
      is in the correct mode.

3.2.8   Restrictions.

a)   The Bird Buffer Program must be in bird-contact mode and the
      Bird Buffer must be hooked to the tracking computer at the
      site.

b)   Only these antenna identification numbers are legal:

    00   (used for suppression only)

    01   Verlort

    02   TIM

    04   T&D

    05   Prelort

    06   Disc-on-rod

    07   Quad-Helix

c)   No antenna may be requested to report when the remote station is unable to send reports from that antenna. This simply means that if the antenna report is not coming into the T&C computer at the station, it cannot be requested by the STC.

3.3   REQUEST COMMANDS.

The Bird Buffer Program will request commands for a vehicle from the
1604 computer and send them directly to the tracking station. All
commands transferred from the 1604 will be sent immediately to the
site.

3.3.1   Tape Usage. Not applicable.

3.3.2   Control Card Format.

Cols.	1-4	**22	Identifies the card as a Request Commands card.
	5-6	blank	Always blank.
	7-10	VVVV	Contains the number of the vehicle that the commands pertain to.
	11-80		These columns are ignored by the program and may be used for further card identification if desired.

3.3.3   Inputs and Environment.

a)   The only input required is the control card.

b)   The Bird Buffer must be connected to the proper 1604 computer
     which must be operating in the satellite mode.

c)   The Bird Buffer Program must be cycling in the bird-contact mode
     and connected to the T&C computer at the site.

d)   The Bird Buffer Printer should be operating so it can receive any
     error or status printouts.

3.3.4   Operator Actions.

a)   Insure that the Bird Buffer is in bird-contact mode, and
     connected to the T&C computer of the station tracking the
     vehicle.

b)   Check the Bird Buffer Printer and make sure it is ready.

c)   Place the control card in the reader and ready the reader.

d)   Inspect any printouts on the Bird Buffer Printer to see if the
     job was successfully completed.

3.3.5   Error Conditions and Status Printouts.

a)   ERROR IN JOB CARD. This printout indicates an error in at least
     one column of the control card. These are some possible errors:
     a non-existent job (Cols. 3-4) has been requested; the vehicle
     number is different from that on the previous INITIALIZE card;
     a non-decimal value appears where a decimal digit is expected.
     Correct the card and reinitiate the job.

b)   BIRD BUFFER NOT INIT. This printout indicates that an INITIALIZE
     card has not been entered since the Bird Buffer Program was
     loaded into core. Initialize the program and reinitiate the job.

c)   ILLEGAL JOB REQUEST. This printout indicates that either the
     Bird Buffer Program is not in bird-contact mode, or that the Bird
     Buffer is not hooked to the tracking computer at the site, or
     both. Reinitiate the job when the computer is in the correct
     mode.

d)   NO RESPONSE-1604. This printout means that the 1604 computer did
     not answer the interrupt from the 160A. The job will have to be
     reinitiated after the 1604 computer is available for the transfer.

e)   VALIDITY LOW CCC OUT. This printout means that the tracking
     station is receiving data with persistent parities. This
     equipment malfunction will have to be rectified before the job
     can be successfully completed.

f)   VALIDITY LOW CCC IN. This printout means that the STA is
     receiving data with persistent parities. This equipment mal-
     function will have to be rectified before the job can be
     successfully completed.

g)   NO DATA FROM 1604. This printout means that the 1604 computer
     has no data of the type requested by the 160A. The job will
     have to be reinitiated after this situation is corrected.

h)   1604 TRANSFER ERRS. This printout indicates that there are
     persistent checksum errors in the data being transferred from
     the 1604. The job will have to be reinitiated after this
     equipment malfunction is corrected.

1) JOB COMPLETE. This printout occurs at the completion of the job. If the job was successful, there will be no error printouts preceding this one. If the job was completed unsuccessfully, error printouts will precede the JOB COMPLETE printout.

3.3.6   Restrictions.

a) The Bird Buffer must be in bird-contact mode, and hooked to the tracking computer at the site.

b) The Bird Buffer must be hooked to a 1604 computer which is presently operating in the satellite mode, and which is ready to respond with the commands requested.

3.4   SEND COMMAND.

A command data or real time corrective action message may be sent to the site when the Bird Buffer is in bird-contact mode.

3.4.1   Tape Usage. Not applicable.

3.4.2   Control Card Format.

3.4.2.1   All cards contain the following information in columns 1-20:

Cols.		
1-4	**23	Identifies this card as a SEND COMMAND card.
5-6	blank	Always blank.
7-10	VVVV	Vehicle number, in decimal.
11-12	blank	Always blank.
13-16	RRRR or blank	Revolution number, in decimal. If blank, this card contains vehicle-specific information.
17	blank	Always blank.
18	C	C = control and status data. 1 = command 4 = real time corrective action
19-20	blank	Always blank.

3.4.2.2   The content of Columns 21-38 depends on the type of command message:
a)   Command Data Message.

Cols.		
21-24	XXXX	XXXX = command number, in decimal.
25-26	blank	Always blank.
27-30	MMMM	MMMM = message count, in decimal.
31-32	blank	Always blank.
33-36	HHHH	HHHH = bit assignments, in octal.
37-38	blank	Always blank.

Cols. 39-40   BBBB   BB = bit count of the command word of the data
               or blank unit, in decimal.

      41-42   blank   Always blank.

      43-N   DDD...D D = command data, in octal (up to 20 columns).

      N-64   blank   Always blank.

      65-68   ΔΔΔΔ   ΛΛΛΛ = duration in seconds that computer should
               or blank wait before transmitting the next command step
                        of a command block, in decimal.

      69-80   These columns are ignored by the Bird Buffer
                        Program, and may be used for further card
                        identification if desired.

b)   Real Time Corrective Action Message.

Cols. 21-24   XXXX   XXXX = command number, in decimal.

      25-26   blank   Always blank.

      27-30   PPPP   PPPP = reply to report number, in decimal.

      31-32   blank   Always blank.

      33-36   HHHH   HHHH = direction indicators, in octal.

      37-38   blank   Always blank.

      39-42   YYYY   YYYY = number of times to advance, in decimal.
               or blank

      43-44   blank   Always blank.

      45-48   YYYY   YYYY = number that reject level should be set
               or blank to, in decimal.

      49-50   blank   Always blank.

      51-54   YYYY   YYYY = number that repetition level should be
               or blank set to, in decimal.

      55-56   blank   Always blank.

      57-60   YYYY   YYYY = new command number, in decimal.
               or blank

Cols. 61-62   blank   Always blank.

63-66   YYYY   YYYY = command number of unit to be deleted,
or blank in decimal.

67-80   These columns are ignored by the Bird Buffer
Program and may be used for further card
identification if desired.

3.4.3   Inputs and Environment.

a) The Bird Buffer Program must be in the computer and operating in the bird-contact mode.

b) The only input required is the control card.

3.4.4   Operator Actions.

a) Ready the printer if not ready.

b) Place the control card in the card reader and ready the reader. No further action should be required.

3.4.5   Error Conditions and Status Printouts.

a) ERROR IN JOB CARD. This printout indicates an error in at least one column of the control card. These are some possible errors: a non-existent job (Cols. 3-4) has been requested; the vehicle number is different from that on the previous INITIALIZE card; a non-decimal value appears where a decimal digit is expected; a non-octal value appears where an octal digit is expected. Correct the card and reinitiate the job.

b) BIRD BUFFER NOT INIT. This printout indicates that an INITIALIZE card has not been entered since the Bird Buffer Program was loaded into core. Initialize the program and reinitiate the job.

c) ILLEGAL JOB REQUEST. This printout indicates that either the Bird Buffer Program is not in bird-contact mode, or that the Bird Buffer is not hooked to the tracking computer at the site, or both. Reinitiate the job when the computer is in the correct mode.

3.4.6   Restrictions. The Bird Buffer must be in the bird-contact mode and
           must be hooked to the tracking computer at the site.

3.5   SEND TEXT

The Bird Buffer will accept at all times a text card, and print the contents of this card on the Bird Buffer Printer. Depending upon the mode of operation, the card may also control printout of the same message on other printers at the STA and at the site.

3.5.1   Tape Usage. Not applicable.

3.5.2   Control Card Format.

Cols.	1-4	**24	Indicates that one line of text should be printed.
	5-6	blank	Always blank.
	7-8	PP	Printer(s) on which the message should be printed, in addition to the Bird Buffer Printer. (Anything printed on the Data Analysis Printer will also appear on the Multi-ops Printer.)

Blank = None

01 = Data Analysis (DA)

02 = Data Presentation (DP)

03 = DA, DP

08 = Telemetry computer (TLM)

09 = TLM, DA

10 = TLM, DP

11 = TLM, DA, DP

16 = Tracking and command computer (T&C)

17 = T&C, DA

18 = T&C, DP

19 = T&C, DA, DP

24 = T&C, TLM

25 = T&C, TLM, DA

26 = T&C, TLM, DP

27 = T&C, TLM, DA, DP

9	E or blank	E causes a page eject before printing.
10	J	J is the number of lines to be skipped before printing. J cannot be greater than 7. If J is zero or blank, the text message will be printed on the next (following) line.
11-80	TT...T	These columns contain the actual text message. Any BCD character which is legal to the 166 printer may be used.

3.5.2.1 Sample card.

Cols. 1-4	7-8	9	10	14-43
**24	10	E	blank	TEXT MESSAGE UP TO 70 CHARACTERS

Contents of this entire card will be logged on the Bird Buffer Printer. The message (including blanks) beginning in column 11, will be printed on the Data Presentation Printer at the STA, and the TLM computer printer at the site if the Bird Buffer is now connected to that computer. In each case, this sample card would cause a page eject before printing.

3.5.3 Inputs and Environment.

The only input is the control card. If output on a site printer is requested, the Bird Buffer must be hooked to that computer.

3.5.4 Operator Actions.

a) Ready the printer and card reader if not ready.
b) Place the control card in the card reader. No further action should be required.

3.5.5 Error Conditions and Status Printouts.

a) ERROR IN JOB CARD. This printout indicates an error in at least one column of the control card. These are some possible errors: a non-existent job (cols. 3-4) has been requested; skipping of more than 7 lines has been requested; a non-decimal value appears where a decimal digit is expected; the named printer does not exist. Correct the card and reinitiate the job.

      b)   BIRD BUFFER NOT INIT. This printout indicates that an INITIALIZE
             card has not been entered since the Bird Buffer Program was
             loaded into core. Initialize the Program and reinitiate the job.

3.5.6   Restrictions.

      a)   If output on a site printer is requested, the Bird Buffer must
             be connected to that computer. If not so connected, an ERROR
             IN JOB CARD printout will result on the Bird Buffer Printer.

      b)   If output on both site printers is requested, and the Bird Buffer
             is only hooked to one site computer, the message will be printed
             on this computer's printer before the ERROR IN JOB card printout.

      c)   No more than 70 BCD characters per line may be printed.

      d)   No more than 7 lines may be skipped before printing. This
             restriction may be overcome by skipping and printing blank
             lines (i.e., leave cols. 11-80 of the control card blank).

3.6   SELECT AND/OR MODIFY TLM MODE.
           This card may be used to modify the telemetry mode currently in use
           by the site, or to select a new telemetry mode for operation. (The
           new mode may also be modified.)

3.6.1   Tape Usage. Not applicable.

3.6.2   Control Card Format.
           a) All cards contain the following information:
           Cols. 1-4   **25   Indicates that a telemetry mode change and/or
                                 modification is to be made.

                  5-6   blank   Always blank.

                  7-10   MMMM   Telemetry mode number, in decimal, which the site
                                 is to use.

                  11-12 blank   Always blank.

                  13   A   Telemetry type. Ignored in bird-contact mode.

                  14-16 blank   Always blank.

           b) If there is no change to the basic mode information, the remainder
           of the card is blank. Otherwise:

                  17-19 PPP   Patchboard ID. Ignored in bird-contact mode.

                  20-21 blank   Always blank.

                  22   P or   P indicates this identification is to be processed.
                         blank   If blank, the identification will not be processed.

                  23-24 blank   Always blank.

                  25   F or E F = fixed format; E = events.

                  26-27 blank   Always blank.

                  28-30 CCC   Identification number, in decimal.

                  31-32 blank   Always blank.

                  33-36 LLLL   Location of the first word in core relative to the
                                 frame, in decimal.

                  37-38 blank   Always blank.

                  39-42 DDDD   The number which must be added to LLLL to obtain
                                 the second word address, in decimal.

                  43-44 blank   Always blank.

                  45-46 CC   Compression algorithm number, in decimal.

47-48	blank	Always blank.
49-52	XXXX	Parameters required by the algorithm, in octal.
53-54	blank	Always blank.
55-58	XXXX	Parameters required by the algorithm, in octal.
59-60	blank	Always blank.
61-64	XXXX	Parameters required by the algorithm, in octal.
65-66	blank	Always blank.
67-70	XXXX	Parameters required by the algorithm, in octal.
71-80		These columns are ignored by the program and may be used for further card identification if desired.

3.6.3   Inputs and Environment.

a) The Bird Buffer Program must be operating in bird-contact mode.

b) The only input required is the control card.

3.6.4   Operator Actions.

a) Ready the printer if not ready.

b) Place the control card in the card reader and ready the reader. No further action should be required.

3.6.5   Error Conditions and Status Printouts.

a) ERROR IN JOB CARD. This printout indicates an error in at least one column of the control card. These are some possible errors: a non-existent job (cols. 3-4) has been requested; a non-decimal value appears where a decimal digit is expected; a non-octal value appears where an octal digit is expected. Correct the card and reinitiate the job.

b) BIRD BUFFER NOT INIT. This printout indicates that an INITIALIZE card has not been entered since the Bird Buffer Program was loaded into core. Initialize the Program and reinitiate the job.

    c)   ILLEGAL JOB REQUEST. This printout indicates that either the
Bird Buffer Program is not in bird-contact mode, or that the
Bird Buffer is not hooked to the telemetry computer at the site,
or both. Reinitiate the job when the computer is in the correct
mode.

3.6.6   Restrictions. The Bird Buffer Program must be in bird-contact mode,
and must be hooked to the telemetry computer at the site.

3.7   SUPPRESS TRK PRINTOUT
           The Bird Buffer normally prints tracking data on remote printers at
           the STA as the data is received during bird contact. This job
           provides the option of suppressing the automatic printing.

3.7.1   Tape Usage. Not applicable.

3.7.2   Control Card Format.
           Cols. 1-4   **26   Indicates that the printout of tracking data
                                should be suppressed.

                 5-6   blank   Always blank.

                 7-8   AA   Identification of the antenna from which the data
                                printout should be suppressed, in decimal.

                 9-80   These columns are ignored by the Bird Buffer
                                Program and may be used for further card
                                identification if desired.

3.7.3   Inputs and Environment.
           a)   The only input is the control card.
           b)   The Bird Buffer must be in the bird-contact mode of operation.

3.7.4   Operator Action.
           a)   Check the Bird Buffer Printer to make certain it is ready.
           b)   Place the control card in the reader and ready the reader. No
                 further action should be necessary.

3.7.5   Error Conditions and Status Printouts.
           a)   ERROR IN JOB CARD. This printout indicates an error in at least
                 one column of the control card. These are some possible errors:
                 a non-existent job (cols. 3-4) has been requested; a non-decimal
                 value appears where a decimal digit is expected. Correct the
                 card and reinitiate the job.
           b)   BIRD BUFFER NOT INIT. This printout indicates that an INITIALIZE
                 card has not been entered since the Bird Buffer Program was
                 loaded into core. Initialize the Program and reinitiate the
                 job.

    c) ILLEGAL JOB REQUEST. This printout indicates that either the Bird Buffer Program is not in bird-contact mode, or that the Bird Buffer is not hooked to the tracking computer at the site, or both. Reinitiate the job when the computer is in the correct mode.

3.7.6   Restrictions.

    a) The Bird Buffer Program must be in bird-contact mode.

    b) Printout of tracking data, once suppressed, is not resumed until specifically requested by means of the REINITIATE TRK PRINTOUT job.

3.8   REINITIATE TRK PRINTOUT
             This job will restore printout of tracking data which has been
             suppressed by the SUPPRESS TRK PRINTOUT job.

3.8.1   Tape Usage. Not applicable.

3.8.2   Control Card Format.

             Cols. 1-4   **27   Indicates that the printout of tracking data
                                   should be reinitiated.

                   5-6   blank   Always blank.

                   7-8   AA   Identification of the antenna from which the data
                                   printout should be reinitiated, in decimal.

                   9-80   These columns are ignored by the Bird Buffer
                                   Program and may be used for further card
                                   identification if desired.

3.8.3   Inputs and Environment.

             a)   The only input is the control card.

             b)   The Bird Buffer must be in the bird-contact mode of operation.

3.8.4   Operator Action.

             a)   Check the Bird Buffer Printer to make certain it is ready.

             b)   Place the control card in the reader and ready the reader. No
                  further action should be necessary.

3.8.5   Error Conditions and Status Printouts.

             a)   ERROR IN JOB CARD. This printout indicates an error in at
                  least one column of the control card. These are some possible
                  errors: a non-existent job (cols. 3-4) has been requested; a
                  non-decimal value appears where a decimal digit is expected.
                  Correct the card and reinitiate the job.

             b)   BIRD BUFFER NOT INIT. This printout indicates that an INITIALIZE
                  card has not been entered since the Bird Buffer Program was
                  loaded into core. Initialize the Program and reinitiate the
                  job.

c) ILLEGAL JOB REQUEST. This printout indicates that either the
Bird Buffer Program is not in bird-contact mode, or that the
Bird Buffer is not hooked to the tracking computer at the site,
or both. Reinitiate the job when the computer is in the correct
mode.

3.8.6   Restrictions. The Bird Buffer Program must be in bird-contact mode.

3.9   ENABLE 1604.

This job prepares the 1604 to receive vehicle time and tracking data
directly from the site during the next pass. Incoming data will be
transferred to the 1604 as soon as received by the Bird Buffer.
Recording of vehicle time and tracking data on the Recording Tape will
not be altered.

3.9.1   Tape Usage. Not applicable.

3.9.2   Control Card Format.

Cols. 1-4   **28   Indicates that this is an ENABLE 1604 card.

     5-80   These columns are ignored by the Bird Buffer
                         Program, and may be used for further card
                         identification if desired.

3.9.3   Inputs and Environments.

a)   The only input for this job is the control card.

b)   The Bird Buffer Program must be in the computer, and the 1604
      programs should be ready to receive messages from the Bird
      Buffer.

3.9.4   Operator Actions.

a)   Insure that the Bird Buffer is hooked to the correct 1604.

b)   Ready the Bird Buffer Printer if not ready.

c)   Place the control card in the reader and ready the reader. No
      further action should be necessary.

3.9.5   Error Conditions and Status Printouts.

a)   ERROR IN JOB CARD. This printout indicates that a non-existent
      job (Cols. 3-4) has been requested. Correct the card and
      reinitiate the job.

b)   BIRD BUFFER NOT INIT. This printout indicates that an INITIALIZE

card has not been entered since the Bird Buffer Program was
loaded into core. Initialize the program and reinitiate the job.

c) NO RESPONSE-1604. This printout means that the 1604 computer did
    not answer the interrupt from the Bird Buffer. The job will have
    to be initiated after the 1604 is properly connected to the 160A.

3.9.6   Restrictions. The Bird Buffer must be presently connected to the
        proper 1604; that is, the 1604 which is to receive the incoming
        vehicle time and tracking data.

4.0 SITE-INITIATED CONTACT

4.1 As well as responding to the STA's "hello" message (see 2.6), a tracking station connected to the Bird Buffer may itself initiate the information flow. This is done by transmitting a "hello" message as dictated by the sites's scheduling data. Upon receipt of the "hello", the Bird Buffer Program will transmit a "ready" message to the site.

4.1.1 Tape Usage:

a) Tape Unit 1 - The Bird Buffer Master Tape.

b) Tape Unit 2 - Prepass Tape for the station indicated by the Bird Buffer schedule, if any, or blank.

c) Tape Unit 3 - Blank tape used for updating prepass data, or as an overflow Recording Tape.

d) Tape Unit 4 - Vehicle Recording Tape, or blank.

4.1.2 Control Card Format: Not applicable.

4.1.3 Inputs and Environments:

a) Tape specified above.

b) Bird Buffer Printer. The remote printers at the STA are used if available.

c) Jump Key 2 - Interrogated after printing on the Bird Buffer printer. If Key 2 is set, the system will halt with 0077 in the accumulator.

d) Jump Key 4 - This key is interrogated when an error is detected in conjunction with the Bird Buffer printer. If the Key is set, the program continues and an attempt will be made to print again after a time delay. If the Key is not set, stop Key 4 is interrogated. (See 4.1.3, e).

e) Stop Key 4 - This key is interrogated after detecting an error in the Bird Buffer printer and jump Key 4 is not set. If the Key is set, the program halts with 0053 in the accumulator. Activation of the run key will cause the program to immediately examine the status of the printer and print if possible. If an error is still encountered, the process described in 4.1.3, d) and e), is repeated.

4.1.4 Operator Actions:

a) Mount the specified tapes.

b) Make appropriate jump/stop key settings.

c) Ready the printer. No further action should be necessary.

4.1.5   Error Conditions and Status Printouts:

a) Bird Buffer Printer error. See 4.1.3 d) and e).

b) IN CONTACT SITE X. This message is logged when a "hello"
    message is received and the message contains vehicle and site
    numbers corresponding to those retained by the Program from
    the previous pass.

c) HELLO REC'D SITE X. This printout is made when the station number
    in the "hello" message differs from the current Bird Buffer
    station number. The system operation as a result of this
    occurrence includes updating the internally stored fixed
    messages and the system station number to the value indicated
    by the "hello" message.

d) BUSY SENT. This message is printed when the station attempts
    contact at the same time that a control card is entered requesting
    job operation.

e) MISCONNECTION REPLY. This message is printed when the station
    sends a misconnection message in response to the "ready" message
    sent by the Bird Buffer. The criterion for transmission of the
    misconnection is that the ready message contained the wrong
    site number.

f) MISCONNECTION SENT. Results from wrong vehicle number in the
    "hello" message.

g) CCC PHANTOM RESUME. Used to indicate CCC disconnection.

h) CCC IN VALIDITY LO. This message is printed when excessive
    checksum parity errors are encountered in the data from the
    tracking station.

i) CCC OUT VALIDITY LO. This message is printed after five
    unsuccessful attempts have been made to transmit a message
    to the tracking station.

4.1.6   Restrictions:

Should the printout BUSY SENT occur, contact will only be initiated
if the station retransmits the "hello" message, or the operator
enters a Contact Site request upon completion of the current job
request.

APPENDIX A - INDEX OF PRINTOUTS

Printout	Section
BIRD BUFFER NOT INIT	General Printout. See 2.2
BUSY REPLY	2.6
BUSY SENT	4.0
CARD READ ERROR	General Printout. See 1.3
CCC DISCONNECTED	2.6, 4.0
ERROR IN JOB CARD	General Printout. See 3.4
ERROR PRINTER X	2.4
FORMAT ERR TAPE X	General Printout. See 2.5
HELLO REC'D SITE X	4.0
ILLEGAL JOB REQUEST	General Printout. See 3.4
IN CONTACT STATION X	2.6, 4.0
INITIALIZE BB....	1.4
JOB COMPLETE	General Printout. See 2.5
MISCONNECTION REPLY	2.6, 4.0
MISCONNECTION SENT	2.6, 4.0
NO DATA FROM 1604	2.3, 2.9, 3.3
NO END CARD FOUND	2.8
NO RESPONSE 1604	2.2, 2.3, 2.9, 3.3, 3.9
NOT FOUND	2.2, 2.4
PLACE NEW TAPE ON X	2.2, 2.4
PREPASS DATA SENT	2.7, 2.9
PREPASS TAPE-UNIT X	2.3, 2.5, 2.7, 2.8, 2.9
READ PARITY TAPE X	General Printout. See 2.5
READY TAPE UNIT X	General Printout. See 2.5
UNABLE TO CONTACT TS	2.6
VALIDITY LO CCC IN	2.7, 2.9, 3.3, 4.0
VALIDITY LO CCC OUT	2.7, 2.9, 3.3, 4.0
WRITE PARITY TAPE X	General Printout. See 2.5
1604 DATA ERROR	2.3, 2.9
1604 TRANSFER ERRS	2.2, 2.3, 2.9, 3.3

External Distribution List

Space Systems Division
(Contracting Agency)
   Major C. R. Bond (SSOCD)
   Major N. D. La Vally (SSOX)

6594th Aerospace Test Wing
(Contracting Agency)
   Lt. Col. A. W. Dill (TWRD) (10)
   Lt. Col. M. S. Mc Dowell (TWRU)
   TWACS (20)

PIR-E1 (Lockheed)
   J. A. Boysen
   N. N. Epstein
   W. E. Moorman
   G. F. Taylor
   R. L. Vader
   P. E. Williams

PIR-E2 (Philco)
   J. A. Bean
   J. A. Isaacs
   R. Morrison
   S. M. Stanley

PIR-E3 (LFE)
   D. F. Criley
   K. B. Williams

PIR-E4 (GE-Box 8661)
   F. T. Clark
   J. D. Rogers
   W. R. Weinrich

PIR-E4 (GE-Santa Clara)
   D. Alexander

PIR-E4 (GE-Sunnyvale)
   J. Farrentine
   N. Kirby

PIR-E4 (GE-Box 8555)
   J. S. Brainard
   R. J. Katucki
   J. D. Selby

PIR-E4 (GE-3198 Chestnut)
   J. F. Butler
   C. A. Cummings
   H. D. Gilman

PIR-E4 (GE-Bethesda)
   A. Pacchioli

PIR-E5 (Aerospace)
   F. M. Adair
   A. Bakst
   J. W. Gengston
   R. V. Bigelow
   R. O. Brandsberg
   L. H. Garcia
   G. J. Hansen (3)
   L. J. Kreisberg
   M. L. Luther
   T. R. Parkin
   E. E. Retzlaff
   H. M. Reynolds
   D. Saadeh
   R. G. Stephenson
   D. D. Stevenson
   V. White

Internal Distribution List

Name	Room	Name	Room
AFCPL (5)	14059	Aldana, J.	24113
Alexander, L. B.	22083	Allfree, D.	22078
Alperin, N. I.	24118A	Armstrong, E.	24089
Becerra, C.	24082	Biggar, D. A. (10)	24090B
Brenton, L. R.	22070	Burke, B. E.	22076
Burke, R. F.	23014	Busch, R. E.	24065B
Bustya, C.	22084	Champaign, M. E.	24127B
Chiodini, C. M.	22078	Ciaccia, B. G.	24082A
Clements, R. F.	24132	Cline, B. J.	24097
Cogley, J. L.	24135	Conger, L.	22079
Crum, D. W.	24093	De Cuir, L. E.	22096A
Derango, W. C.	24082B	Dexter, G. W.	24128
Disse, R. J.	24139	Dobbs, G. H.	24094B
Dobrusky, W. B.	22125	Dugas, R. L.	24105
Ellis, R. C.	24081	Ericksen, S. R.	24110A
Francis, C. W.	20075	Franks, M. A.	25030
Friedman, L.	22083	Gardner, S. A.	22053
Gergen, V. J.	24109	Greenwald, I. D.	24058A
Haake, J. W.	24120	Henley, D. E.	24058B
Hill, C. L.	24057	Hillhouse, J.	24049
Holzman, H. J.	22096B	Hudson, G. R.	22101
Johnson, R. E.	24105	Kastama, P. T.	24053
Katz, M.	24109	Kayser, F. M.	25026
Keddy, J. R.	25026	Key, C. D.	24123
Keyes, R. A.	20073	Kneemeyer, J. A.	24065A
Knight, R. D.	24110B	Knight, R. W.	22095
Kolbo, L. A.	24139	Laughlin, J. L.	20073
La Vine, J.	20079	Little, J. L.	20077
Long, F.	24122	Lytton, J. G.	24077
Madrid, G. A.	22049	Mahon, G. A.	20076
Marioni, J. D.	24076B	Marshall, R. D.	24045
Martin, W. P.	24089	Mc Keown, J.	24121
Milanese, J. J.	24121	Munson, J. B.	24048A
Myers, G. L.	14056A	Ngou, L.	25030
Olson, M. M.	24124	Padgett, L. A.	24085
Patin, O. E.	Sunnyvale	Persico, D. J.	20076
Polk, T. W.	24103	Reilly, D. F.	24085
Rockwell, M.	22070	Scott, R. J.	24093
Seacat, C. M.	Sunnyvale	Seiden, H. R.	22091A
Shapiro, R. S.	25026	Shoel, S. J.	24123
Skelton, R. H.	24127A	Speer, N. J.	20079
Stone, E. S.	22116B	Sweeney, M. J.	24057
Taber, W. E.	22053	Tennant, T. C.	27024
Thompson, J. W.	22077	Totschek, R. A.	24090A

(Internal Distribution List, Cont.)

Name	Room
Tucker, A. E.	24115
Vorhaus, A. H.	24076A
Weems, S.	24115
Weinstock, M.	22095
West, G. D.	Sunnyvale
West, G. P.	24094A
Williams, H. D.	24091
Wilson, G. D.	22101
Winsor, M. E.	24137
Winter, J. E.	24097
Wise, R. C.	24051
Wong, J. P.	Sunnyvale
Zachte, S. A.	22076

System Development Corporation,
Santa Monica, California
MILESTONE 5, VOLUME 2 PRELIMINARY
OPERATING PROCEDURES FOR THE BIRD
BUFFER SYSTEM.
Scientific rept., TM(L)-834/002/00,
by R. J. Scott. 5 March 1963, 65p.
(Contract AF 19(628)-1648, Space Systems
Division Program, for Space Systems
Division, AFSC)

Unclassified report

DESCRIPTORS: Programming (Computers),
Satellite Networks.

Describes procedures used for reading
the Bird Buffer Program into the 160

and beginning operations with it.
States that the operational programs
contained on the Bird Buffer Master
Tape have two phases of operation:
bird-contact and non-bird-contact.
Also states that the bird-contact mode
begins after a "real time near" message
is received from a site, and any prepass
data not previously sent has been
transferred. Contains descriptions and
operating procedures for all jobs
initiated by the Bird Buffer operator -
including the format of each control
card accepted by the program.