IMAGE SELECTION SYSTEM: OPERATOR'S PROCEDURES MANUAL

Job Order 71-475

Prepared By

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FOREWORD

The purpose of this manual is to consolidate essential retrieval parameter tables on the Image Selection System from two separate operations manuals of the Electromagnetic Systems Laboratory, Incorporated (ESL), and to provide one example of a typical retrieval session. The system has many capabilities which cannot be readily covered in a manual of this size; therefore, persons wishing to experiment with or exercise some of these additional commands should consult the two ESL manuals mentioned below.

Command and some retrieval parameter tables are taken directly from two manuals produced by ESL, Inc., at Sunnyvale, California, under contract to the National Aeronautics and Space Administration. The manuals are *Image Selection System Operator's Manual* (ESL-IM95, dated July 31, 1974) and *Data Entry System Operator's Manual for ERAP Data Handling System*, AMES-ERAP Version (ESL-IM86, dated June 1974).

The assistance of personnel of the Data Transformation Corporation in providing some updated retrieval parameter tables is also gratefully acknowledged. The updated parameter tables were extracted from the *Earth Resources Data Catalog and Index System Formats and Standard Code Table Control Book* published for the Flight Operations Division of the National Aeronautics and Space Administration at the Lyndon B. Johnson Space Center in January 1975.

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GENERAL INFORMATION ON THE IMAGE SELECTION SYSTEM

SYSTEM DESCRIPTION

The Image Selection System (ISS) consists of two major processors, the data initializer and the data discriminator.

The Data Initializer can be classified into the following subprograms/subroutines: log on (LOG), which accesses the Hewlett-Packard 3000 computer; User Identification (IDN); Boundary Entry (BND); Mandatory Requirements (MRE); Analysis Grid Blocks (GRI); or Search (SEA).

The data discriminator consists of filter/display commands, data management commands, and utility commands. A discussion of specific commands and their use is presented in the *Operator's Manual* (ESL-IM95).

The Data Initializer operates in the conversational mode; that is, once logged on, the operator is prompted to answer several simple, direct questions about the query parameters. The Data Discriminator, on the other hand, requires a greater knowledge of commands, command formats, and the expected results of manipulating the data upon retrieval.

GENERAL TERMINAL PROCEDURES

The electrical power of the ISS data terminal is turned on/off by the single master switch on the electrical outlet strip located under the right-hand edge of the station table surface. Failure to turn off the power by this switch causes all other stations to literally go "off the air" and to become unable to continue until extensive restoration steps are taken. If no raster appears on the screen, check that the Tektronix terminal switch is on; otherwise, call the systems analyst or the terminal technician.

No other switches or dials are to be changed because they have been preset for maximum intensity and contrast commensurate with good practice and for prevention of "burning in" shadows on the face of the cathode-ray tube (CRT) or "blotching" on images produced by the hard-copy printer.

POWER-ON/LOG-ON

The seven power-on and log-on steps are as follows:

1. Allow the electronics to warm up for at least one full minute.
2. Key the ERASE button once to clear the screen; otherwise, the phosphors, being very intense, make it difficult to see what you have entered on the keyboard.
3. Key the carriage return (CR) once; this action results in the computer prompt character [a colon (:)].
4. Enter "HELLO ISS17.ISS" and CR; the machine will respond with some system information and another prompt (:).
5. Enter "RUN ISS#" (current version # is 1) and CR. You are now into the system; additional steps for retrieval sessions are presented in appendix A.
6. The system will ask you to enter your initials. Three initials should be entered, and NO CR is required until the system responds.
7. The system will automatically go to the IDN section and begin directing your responses by asking questions. The operator's initials are essential as are the answers to the questions concerning automatic displays and automatic hard copy. The requestor's name and address may be skipped effectively, if desired, by simply keying a CR (default) after each such question.

END OF SESSION AND POWER-OFF

End-of-session and power-off steps are as follows:

1. At any point in the system in which you wish to terminate the session *and* the system has given you the system prompt (:), enter "BYE."
2. At any other time, depress the "break" key. When all other response from the computer ceases and gives the ":" prompt, type in the word "abort." Then follow step 1 to terminate the session. The computer will respond with usage data which you must enter into the ISS 17 terminal log book. Specific log book instructions can be found on the inside cover.
3. Power-off is accomplished by flipping the master power switch (on the outlet block under the table) to the off position. NO OTHER SWITCHES OR DIALS SHOULD BE ACTIVATED OR DEACTIVATED.

TRANSMITTING COMMANDS

The steps for transmitting commands to the computer are as follows:

1. When the operating system is being addressed (whenever you get a ":" prompt) in the Data Initializer portion of the system, transmittal of each command to the computer is effected by keying the CR.
2. In the Data Discriminator (scratch pad), it is necessary to key a CR PLUS the "send" button in order to transmit the command to the computer.
3. When crosshairs are being used in Data Discriminator, entry of the single letter commands (app. B) is sufficient. If other displays, such as OVRWRT, are desired, it is necessary to go back to the scratch pad before entering other commands. To turn off the crosshairs and get back to the scratch pad, key the space bar *twice*.

4. To terminate a session, first get to the scratch pad, enter "-QUIT," and transmit the command as described in step 2. Then follow the "end-of-session" and power-off steps 1 to 4.

CONTENTS OF THE APPENDICES

Appendix A contains a typical retrieval session although not all displays and options are exercised. The utility and advantages of using other possible options will be learned later as the operator gains experience.

Appendix B contains the appropriate information required to operate properly in the Data Initializer phase of the system. The Boolean logic, comments on analysis or GRI sizes, and limiting parameter tables apply equally within the Data Discriminator subprogram.

Appendix C contains the appropriate information required to operate properly in the Data Discriminator.

DATA INITIALIZER

The data initializer has six legal commands.

1. The command *go* steps through each of the six subroutines (LOG, IDN, BND, MRE, GRI, and SEA) in order.
2. The command *go to* (subroutine name) allows the operator to back up or jump ahead and to redefine parameters such as the BND expression or MRE. All previously input parameters of that subroutine are wiped out.
3. The command *fix* is used to correct minor errors when used with a "c" suffixed subroutine name (see 2 above and appendix B).
4. The command *verify* displays command(s) or Boolean expression.
5. The command *display* is used to call a graphic display to the CRT.

Options	Type display
1	Boundary expression
2	Boundary expression plus system blocks plus total number of pictures in selected area
3	Boundary expression plus system sub-blocks plus total number of pictures in selected area
4	Boundary expression plus analysis grid blocks

6. The question mark (?) after any prompt gives an explanation of the prompt. At the command level, it explains the active command.

DATA DISCRIMINATOR

AUTOMATIC SWITCHING

The system automatically switches into the Data Discriminator upon completing the search phase and after naming the secondary data base. This shift or switching becomes obvious to the operator because the "scratch pad" area and the "edit" light are turned on, and all commands are then entered at the bottom of the screen.

VALID COMMANDS

Within the Data Discriminator, there are 13 valid commands; the most commonly used are "DISPLAY," "OVRWRT," "GRID," and "QUIT." Although "PURGE" and utility "XCISE" are valid commands, their use is absolutely forbidden because the commands will delete needed information from the primary data base. For proper usage of the other Data Discriminator commands, see the *ISS Operator's Manual* (ESL publication ESL-IM95).

"DISPLAY AND "OVRWRT" COMMANDS

The DISPLAY and OVRWRT commands have 10 options, each one of which must be entered as part of the command (command argument). The available options are explained in appendix C.

Of all the options available, probably the most powerful and most commonly used are options 6 and 7. The use of option 6 versus 7 provides an interesting aspect of the display in that option 6 concentrates on one analysis grid block, thus effectively scaling up the data within the block (spreads out the frame center x's). This effect is often desirable to more readily position the crosshairs for individual frame interrogation and to eliminate some of the clutter where sizable quantities of data are present.

1. Option 6 provides a display containing analysis grid blocks (or system sub-blocks), plus the center points of each frame annotated as an "x," and turns on the crosshairs for individual frame interrogation.

2. Option 7 is quite similar to option 6 except that no analysis grid blocks appear and the display contains all data in the named secondary data base.

Although the other "DISPLAY" and "OVRWRT" options are available, their use has some disadvantages not present with options 6 and 7. These disadvantages are the following:

1. In displays in which the frame center points are represented by dots, the dots are considerably more difficult to see than the x's without making various machine intensity adjustments. NOTE: Such adjustments have been *forbidden* to anyone other than the systems analyst or technician to prevent unnecessary hardware problems and to keep the adjustments as uniform as possible.

2. Because every frame is outlined, the displays calling directly for frame perimeters usually become excessively cluttered.

It is far better to use the "o" (outline) option with the crosshairs to outline one or more specific frames at the operator's discretion.

USE OF THE CROSSHAIRS

Seven options are available for operator usage when the crosshairs are turned on. Assuming the crosshairs have been positioned on (or very nearly onto) the center point of a frame of interest, a single letter command provides the desired information for a specific frame. The most commonly used options are the following:

1. "o" – to outline the frame perimeter,
2. "c" – to write out the center coordinates of the frame,
3. "I" – to write out the various information fields (e.g., roll/frame number, browse file number, flight number, cloud cover, quality, format, flight date, sensor identification, scale, spectral band, and film type), and
4. "A" – to write out only the mission, roll, and frame numbers.
5. "V" – to place a number where the crosshairs are positioned and list the latitude/longitude of the crosshairs. This is useful for correlation of precisely which frames have been interrogated.

For other crosshair options, see table 3-4 of the ISS *Operator's Manual* (ESL-IM95) or appendix C. To turn off the crosshairs and return to the scratch pad command area, simply key the space bar twice.

LIST OPTIONS

It is possible to generate tabular listings of the data contained in any named secondary or tertiary data base either for on-line display (and/or copying) or for off-line printing. Off-line printouts must be picked up personnally from Building 12 at the Institutional Data Systems Division job control Office (ask for

data from the Hewlett-Packard 3000 box). NOTE: If you did not fill in your name (and similar, pertinent information) in the IDN section of your query, it may be very difficult to identify your data from that of the Data Transformation Corporation data entry personnel.

The List Options are as follows:

Option	On/off-line	Comments
1	Off-line	Data and titles are abbreviated/encoded.
2	Off-line	Data and titles are decoded (in plain English).
3	On-line	CRT display; abbreviated/encoded form; can be copied. NOTE: Lengthy lists should always be printed off-line.
4	Off-line	Sorted on mission, roll, and frame; lists all four frame corner coordinates and center coordinates plus other data in abbreviated/encoded form; starts new computer page for each mission.

ADDITIONAL COMMANDS

A number of additional commands and some utility subroutines are available to the user for refining data retrieved from the secondary data base. These will merely be named here rather than extend the manual unnecessarily. Anyone desiring to use these commands can consult the reference manual (ESL-IM95).

The commands include:

KEEP	RECAL
SAVE	NAMES
ELIMINATE	HISTGRM (histogram)

CAUTION: The utility commands "XCISE" or "Purge" should never be used by anyone except the ISS data base manager because valid data in the main base can be destroyed and recovery would be very costly.

APPENDIX A

TYPICAL RETRIEVAL SESSION

```
:HELLO ISS17.ISS
 SESSION NUMBER = *S19
 TUE, SEP 30, 1975,  2:47 PM
 HP32000C.00.07

:RUN ISS1
```

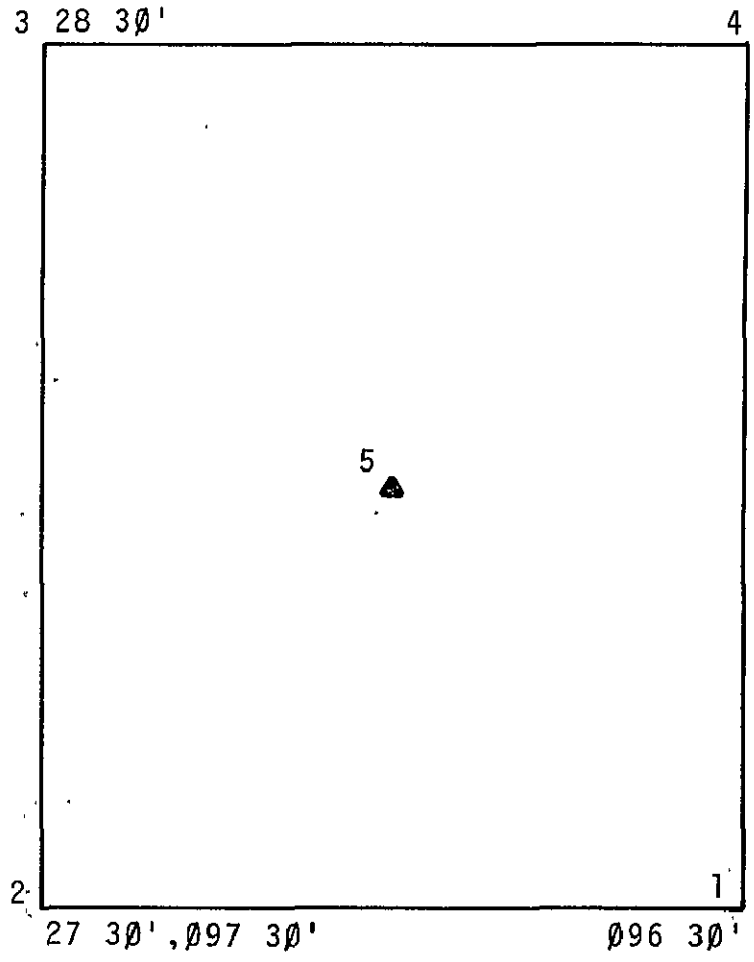
NOTE: All items underlined are operator entries; all else is system response.

Figure A-1.— Log-on procedure.

```
  YOUR INITIALS: CCD
FILE FIN06=ISR2487.SEARCH.ISS.OLD:CCTL:ACC=OUT
              WELCOME TO THE NASA JSC IMAGE SELECTION SYSTEM


RESTART? N                                          NOTE:  To default, hit carriage return.
ENTER PROGRAM PARAMETERS
TEK TERMINAL? DEFAULT = YES
LONG MESSAGES? DEFAULT = NO
AUTO-HARDCOPY? DEFAULT = NO
AUTO-DISPLAYS? DEFAULT = NO     YES
ANALYST: CHARLIE

COMMAND: G
SECTION TO ENTER USER IDENTIFICATION
NAME: PROCEDURES MANUAL
ORG: LOCKHEED
STREET:  16811 EL CAMINO REAL
CITY,STATE: HOUSTON,TEXAS
ZIP: 77058

COMMAND: G                                          NOTE:  Boundary entry methods
CODE: 1                                                    Code 1 = point-square
ENTER CENTER POINT AND LENGTH OF SIDE(MIN.)                Code 2 = spark-pen
DD MM DDD MM   SSS                                         Code 3 = keyboard
28 00 097 00   60                                          Code 4 = rectangle
```


Figure A-2.— Program initialization, user identification, and boundary expression entry.

COMMAND: G



1. 27 3Ø',Ø96 3Ø'
2. 27 3Ø',Ø97 3Ø'
3. 28 3Ø',Ø97 3Ø'
4. 28 3Ø',Ø96 3Ø'
5. 28 ØØ',Ø97 ØØ'

Figure A-3.— Boundary expression display.

TOTAL PICTURES: 311

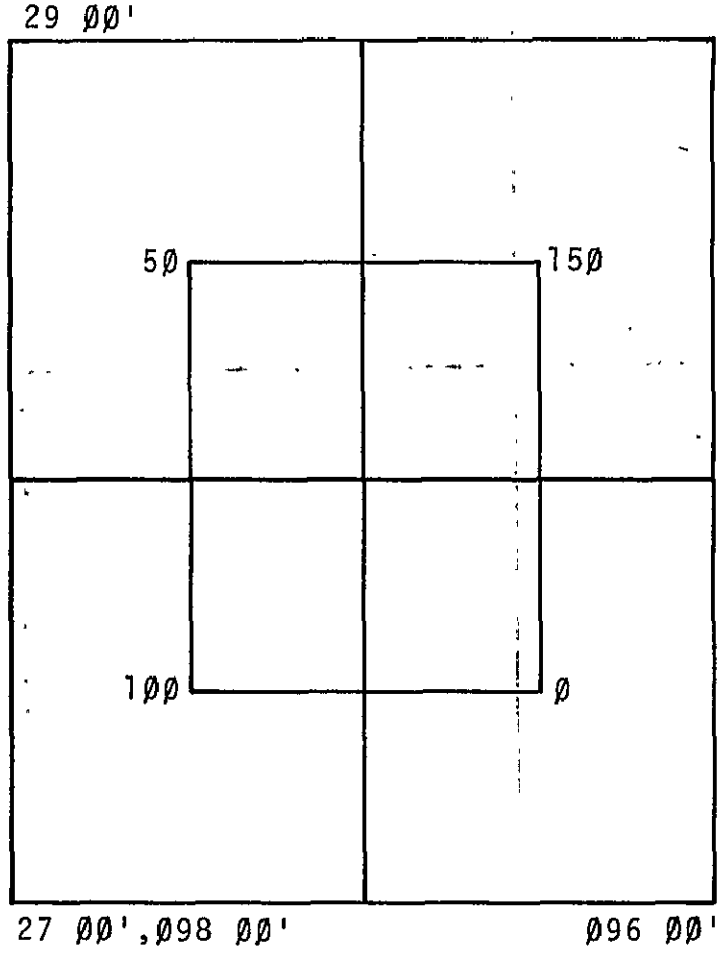


Figure A-4.— Display of system blocks.

```
TOTAL PICTURES:  311MANDATORY REQUIREMENTS
TO BE ENTERED
LIMIT: FT=3
LIMIT:

COMMAND: G
ANALYSIS GRID BLOCKS? N

COMMAND: G
```

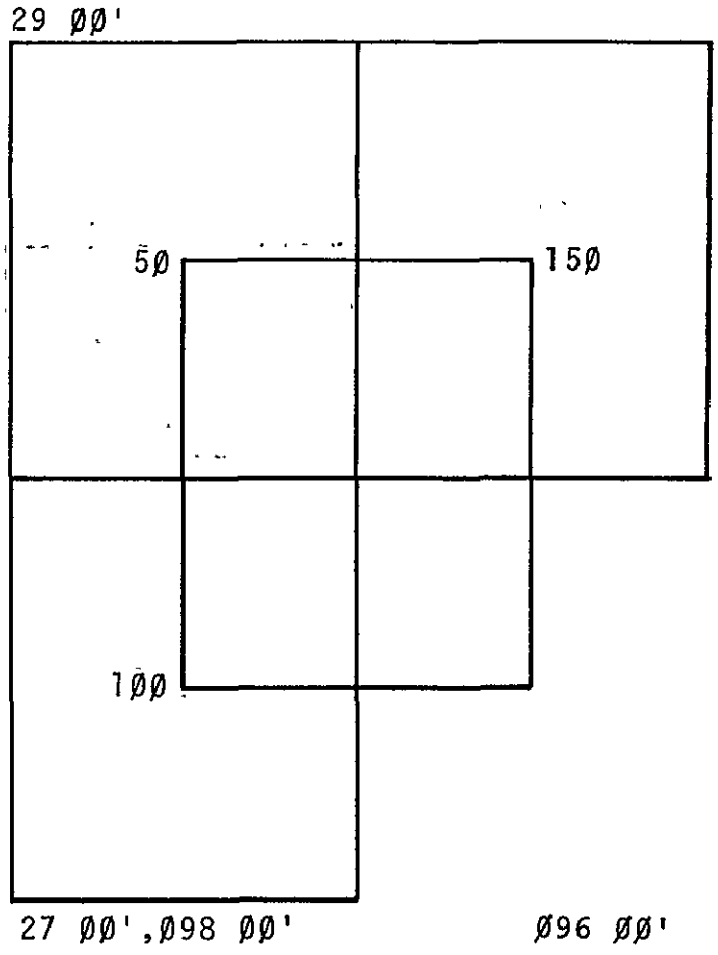


Figure A-5.— Display of system sub-blocks.

```
ENTER A NAME FOR THE DATA
BASE JUST CREATED.
CHAR
TOTAL PICTURES:  31
COMMAND: G
```

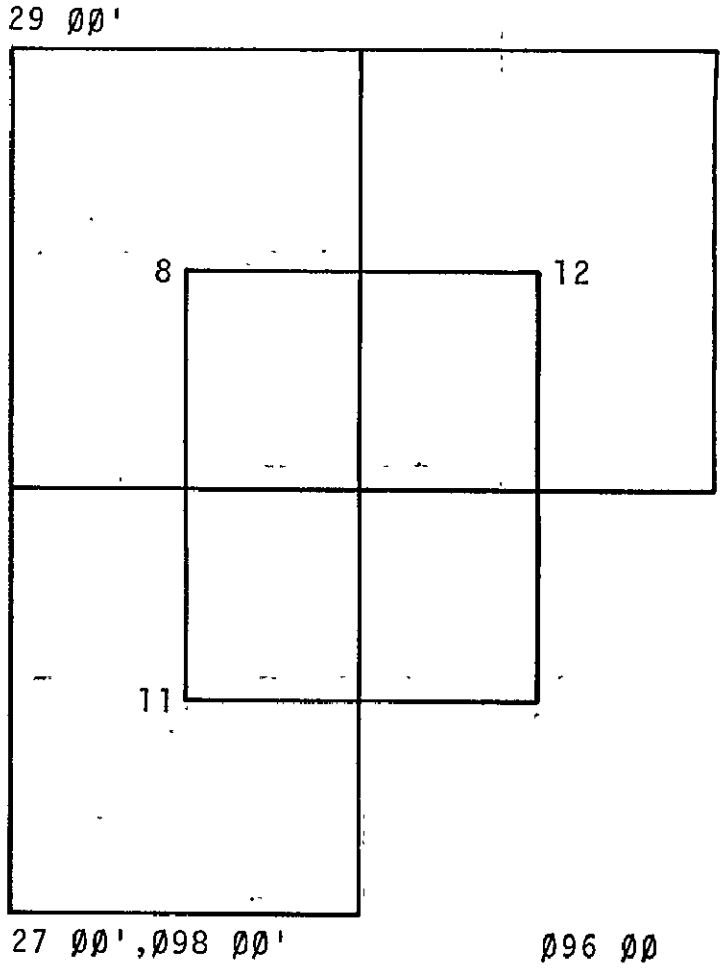


Figure A-6.— Secondary data base creation.

```
-GRID(6X6)
COMMAND SYNTAX ERROR

-GRID(6,6)
TOTAL PICTURES:   31
KEYBOARD(K) OR CURSOR(C)? K
TL AND BR CORNERS:
29 ØØ Ø98 ØØ
28 ØØ Ø97 ØØ
```

Scratch pad-error

Scratch pad-correct

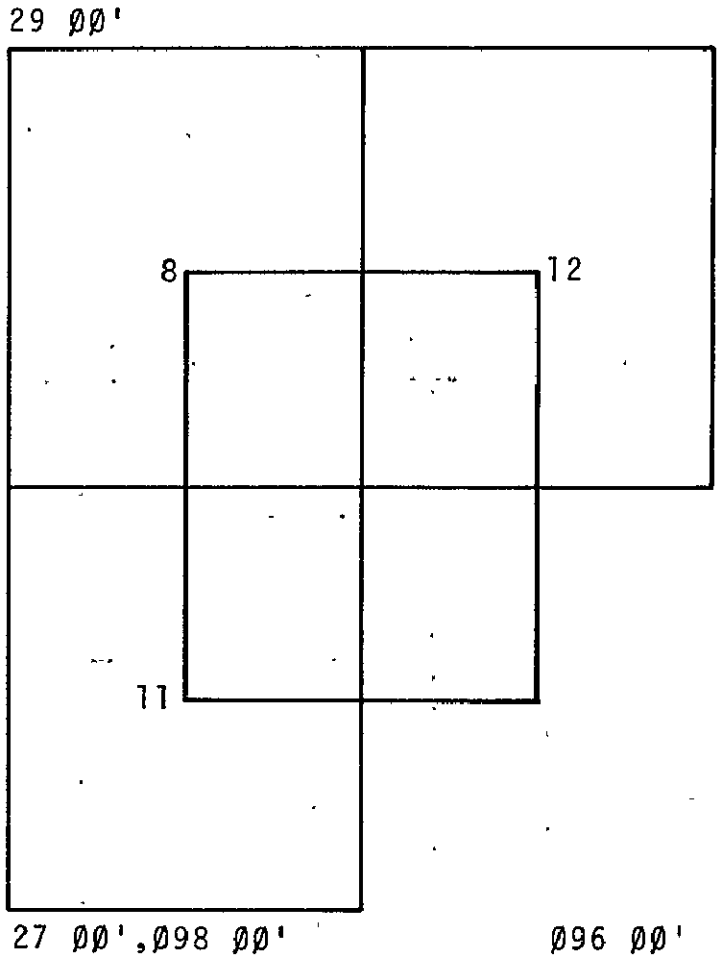


Figure A-7.— Grid block entry from the Data Discriminator.

-D(OPT=6)

Sratch pad

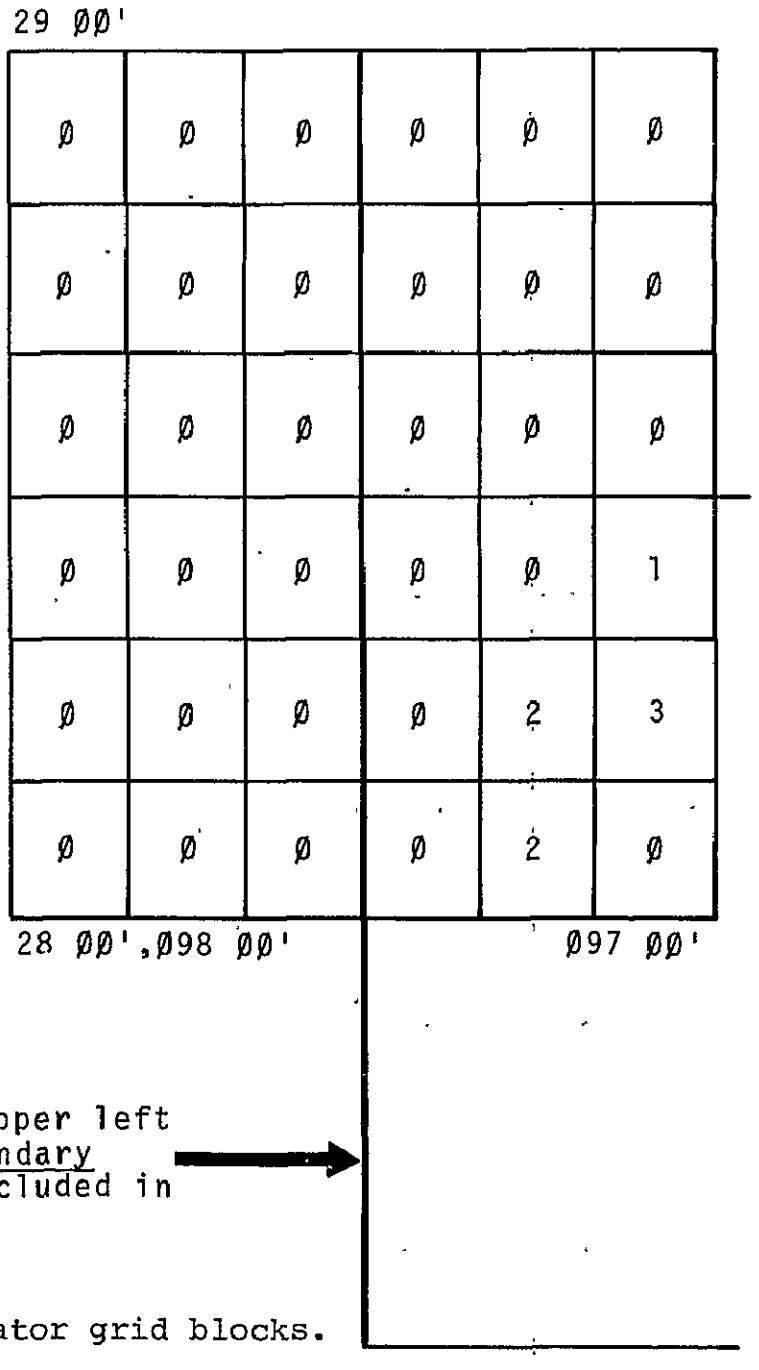


Figure A-8.— Actual discriminator grid blocks.

```
-D(OPT=6)
TOTAL PICTURES:     8
1 28 Ø1',Ø97 15'
AC=3ØØØØ9ØØ29, BN=3ØØ1Ø593
MF=3ØØØØ5,CC= Ø,QU=2,FØ= 3
FD=75Ø56,SI=63Ø,SC=118
FT= 3,SL= 52Ø,SH= 8ØØ
2 28 15',Ø97 ØØ'N=
AC=3ØØØØ9ØØ32, BN=3ØØ1Ø596
MF=3ØØØØ5,CC= Ø,QU=2,FO= 3
FD=75Ø56,SI=63Ø,SC=119
FT= 3,SL= 52Ø,SH= 8ØØ

3 28 21',Ø97 Ø6'N=
AC=3ØØØØ9ØØ33, BN-3ØØ1Ø597
MF=3ØØØØ5,CC= Ø,QU=2,FO=3
FD=75Ø56,SI=63Ø,SC=119
FT= 3,SL= 52Ø,SH= 8ØØ

-QUIT                              Scratch pad
 END OF PROGRAM
:BYE                               Log-off system

CPU (SEC) = 29
CONNECT (MIN) = 18
TUE, SEP 3Ø, 1975,  3:Ø5 PM
END OF SESSION
```

NOTE: Underlined #'s 1, 2, 3 were entered by use of crosshair positioning and depressing "V."

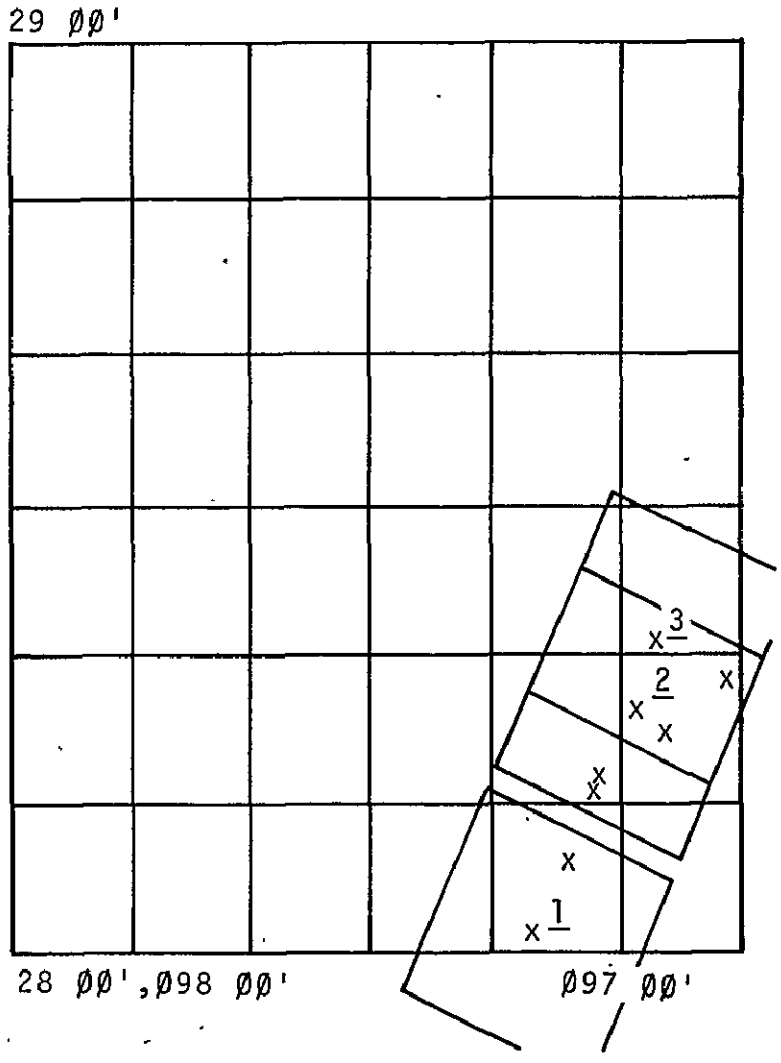


Figure A-9.— Gridded representation of images with image information interrogation and log-off procedure.

TABLE B-I.— VALID TARGETS FOR GO TO COMMAND[a]

Mnemonic call word	Branch location	Comments
LOG IDN BND MRE GRI SEA RET	Log-on — program parameters entered User identification Boundary entry section Mandatory requirements Analysis grid specification Search section Data discriminator	Allow the operator to proceed directly to the applicable initializer submodule and enter necessary information. All previous information in that submodule is purged.
CLOG CIDN CBND CMRE CGRI CSEA	Log-on command section Identification command section Boundary entry command section Mandatory requirements command section Analysis grid specification Search command section	Allow the operator to verify, display, or fix input parameters in each of the applicable initializer submodules. The "C" prefix inhibits automatic purging of the information in the referenced submodule.

[a]Table taken from *Image Selection System Operator's Manual*, ESL-IM95 (July 31, 1974), p. 2-5.

TABLE B-II.— SENSOR IDENTIFICATION

[From the DTC earth resources catalog, pp. 2-19 to 2-22]

Sensor description	Sensor code	Focal length	Format size	Film format code	Manufacturer's serial number	NASA number
Hasselblad 70-mm framing camera	526	80 mm	2.25 × 2.25 in.	1	4592 515	89006
Hasselblad 70-mm framing camera	526	80 mm	2.25 × 2.25 in.	1	4598 802	89009
Hasselblad 70-mm framing camera	526	80 mm	2.25 × 2.25 in.	1	4598 604	89010
Hasselblad 70-mm framing camera	526	80 mm	2.25 × 2.25 in.	1	4596 807	89011
Hasselblad 70-mm framing camera	526	80 mm	2.25 × 2.25 in.	1	4595 227	89012
Hasselblad 70-mm framing camera	526	80 mm	2.25 × 2.25 in.	1	4598 495	89013
Hasselblad 70-mm framing camera	554	150 mm	2.25 × 2.25 in.	1	5270 761	90998
Hasselblad 70-mm framing camera	554	150 mm	2.25 × 2.25 in.	1	4590 459	77676
Hasselblad 70-mm framing camera	554	150 mm	2.25 × 2.25 in.	1	4590 794	77677
Hasselblad 70-mm framing camera	554	150 mm	2.25 × 2.25 in.	1	4590 802	77678
Hasselblad 70-mm framing camera	554	150 mm	2.25 × 2.25 in.	1	4590 806	77679
Hasselblad 70-mm framing camera	554	150 mm	2.25 × 2.25 in.	1	4590 900	77680
Hasselblad 70-mm framing camera	554	150 mm	2.25 × 2.25 in.	1	4805 354	77681
Hasselblad 70-mm framing camera	554	150 mm	2.25 × 2.25 in.	1	4805 359	77682
Hasselblad 70-mm framing camera	554	150 mm	2.25 × 2.25 in.	1	4805 360	77683
I^2S multispectral framing camera	566	150 mm	3.5 × 3.5 in.	2	023	90509
I^2S multispectral framing camera	567	150 mm	3.5 × 3.5 in	2	025	90511
KA96 high-resolution framing camera	568	24 in.	4.5 × 4.5 in.	6	3261 104	(a)
AMPS station 1 multiband 70-mm framing camera	569	6 in.	2.25 × 2.25 in.	1	001 49	95242
AMPS station 2 multiband 70-mm framing camera	570	6 in.	2.25 × 2.25 in.	1	001 37	95242
AMPS station 3 multiband 70-mm framing camera	571	6 in.	2.25 × 2.25 in.	1	001 50	95242
AMPS station 4 multiband 70-mm framing camera	572	6 in.	2.25 × 2.25 in.	1	001 48	95242
AMPS station 5 multiband 70-mm framing camera	573	6 in.	2.25 × 2.25 in.	1	001 43	95242
AMPS station 6 multiband 70-mm framing camera	574	6 in.	2.25 × 2.25 in.	1	001 47	95242
AMPS station 1 multiband 70-mm framing camera	575	6 in.	2.25 × 2.25 in.	1	002 36	95243
AMPS station 2 multiband 70-mm framing camera	576	6 in.	2.25 × 2.25 in.	1	002 41	95243
AMPS station 3 multiband 70-mm framing camera	577	6 in.	2.25 × 2.25 in	1	002 52	95243
AMPS station 4 multiband 70-mm framing camera	578	6 in.	2.25 × 2.25 in.	1	002 38	95243
AMPS station 5 multiband 70-mm framing camera	579	6 in.	2.25 × 2.25 in.	1	002 35	95243
AMPS station 6 multiband 70-mm framing camera	580	6 in.	2.25 × 2.25 in.	1	002 46	95243
AMPS station 1 multiband 70-mm framing camera	581	6 in.	2.25 × 2.25 in.	1	003 56	95244
AMPS station 2 multiband 70-mm framing camera	582	6 in.	2.25 × 2.25 in.	1	003 55	95244
AMPS station 3 multiband 70-mm framing camera	583	6 in.	2.25 × 2.25 in	1	003 57	95244
AMPS station 4 multiband 70-mm framing camera	584	6 in.	2.25 × 2.25 in.	1	003 53	95244
AMPS station 5 multiband 70-mm framing camera	586	6 in.	2.25 × 2.25 in.	1	003 45	95244

[a]No NASA number assigned.

TABLE B-II.— SENSOR IDENTIFICATION, Continued

Sensor description	Sensor code	Focal length	Format size	Film format code	Manufacturer's serial number	NASA number
AMPS station 6 multiband 70-mm framing camera	587	6 in.	2.25 × 2.25 in.	1	003 58	95244
RC-8 metric framing camera	588	6 in.	9 × 9 in.	3	927 384	76420
RC-8 metric framing camera	588	6 in.	9 × 9 in.	3	920 391	89809
RC-8 metric framing camera	588	6 in.	9 × 9 in.	3	902 353	89810
KA62 multiband framing camera	596	3 in.	4.5 × 4.5 in.	6	1 215	73013
KA62 multiband framing camera	596	3 in.	4.5 × 4.5 in.	6	2 214	73014
KA62 multiband framing camera	596	3 in.	4.5 × 4.5 in.	6	5 208	73015
KA62 multiband framing camera	596	3 in.	4.5 × 4.5 in.	6	3 217	73075
KA62 multiband framing camera	596	3 in.	4.5 × 4.5 in.	6	4 216	73076
HP-307D 70-mm pan-framing camera	601	80 mm	2.25 × 7.2 in.	7	001	84776
HP-307D 70-mm pan-framing camera	601	80 mm	2.25 × 7.2 in.	7	002	(a)
HP-307D 70-mm pan-framing camera	601	80 mm	2.25 × 7.2 in.	7	003	85441
HP-307D 70-mm pan-framing camera	601	80 mm	2.25 × 7.2 in.	7	005	85442
HP-307D 70-mm pan-framing camera	601	80 mm	2.25 × 7.2 in.	7	004	85443
HP-307D 70-mm pan-framing camera	601	80 mm	2.25 × 7.2 in.	7	006	85444
Zeiss RMK A 15/23 metric framing camera	605	6 in.	9 × 9 in.	3	21194	61516
Zeiss RMK A 30/23 metric framing camera	606	12 in.	9 × 9 in.	3	110407	65116
Optical bar panoramic camera	607	24 in.	4.5 × 45.24 in	8	(b)	(a)
Earth terrain camera	608	18 in.	4.5 × 4.5 in.	6	(b)	003
Hasselblad hand-held satellite camera (Apollo, Gemini)	610	38 mm	70 mm		(b)	002
Hasselblad hand held satellite camera (Apollo, Gemini)	612	60 mm	70 mm	1	(b)	(a)
Hasselblad hand-held satellite camera (Apollo, Gemini)	613	80 mm	70 mm	1	(b)	(a)
Hasselblad hand-held satellite camera (Apollo, Gemini)	614	100 mm	70 mm	1	(b)	(a)
Hasselblad electric camera (Apollo)	615	105 mm	70 mm	1	(b)	(a)
Hasselblad electric camera (Apollo)	616	250 mm	70 mm	1	(b)	(a)
Hasselblad electric camera (Apollo)	617	500 mm	70 mm	1	(b)	(a)
Nikon hand-held camera (Apollo)	618	55 mm	35 mm	5	(b)	(a)
Mauer (Gemini)	619	50 mm	70 mm	1	(b)	(a)

[a] No NASA number assigned

[b] No serial number given.

TABLE B-II.– SENSOR IDENTIFICATION, Concluded

Sensor description	Sensor code	Focal length	Format size	Film format code	Manufacturer's serial number	NASA number
Mauer (Gemini)	620	80 mm	70 mm	1	(b)	(a)
S190A multispectral camera	621	6 in.	2.25 × 2.25 (70 mm)	1	002-1	$^{c}15$
S190A multispectral camera	622	6 in.	2.25 × 2.25 (70 mm)	1	002-2	$^{c}08$
S190A multispectral camera	623	6 in.	2.25 × 2.25 (70 mm)	1	002-3	$^{c}11$
S190A multispectral camera	624	6 in.	2.25 × 2.25 (70 mm)	1	002-4	$^{c}02$
S190A multispectral camera	625	6 in.	2.25 × 2.25 (70 mm)	1	002-5	$^{c}06$
S190A multispectral camera	626	6 in.	2.25 × 2.25 (70 mm)	1	002-6	$^{c}10$
Zeiss RMK A 15/23 metric framing camera	627	6 in.	9 × 9 in.	3	119029	100259
Zeiss RMK A 15/23 metric framing camera	628	6 in.	9 × 9 in.	3	119030	100260
Zeiss RMK A 15/23 metric framing camera	629	6 in.	9 × 9 in.	3	119032	100266
Zeiss RMK A 15/23 metric framing camera	630	6 in.	9 × 9 in.	3	119034	100265
Zeiss RMK A 15/23 metric framing camera	631	6 in.	9 × 9 in.	3	119036	100269
Zeiss RMK A 15/23 metric framing camera	632	6 in.	9 × 9 in.	3	119039	100270
Zeiss RMK A 15/23 metric framing camera	633	6 in.	9 × 9 in.	3	119037	100271
Zeiss RMK A 15/23 metric framing camera	634	6 in.	9 × 9 in.	3	119040	100272
Itek 9 - station multiband	635	6 in.	70 mm	1	003	(a)

[a]No NASA number assigned.

[b]No serial number given.

[c]Reseau number.

DATA INITIALIZER COMMANDS[1]

Operation within the Data Initializer is accomplished with the six following commands:

a. GO
b. GO TO nn
c. FIX
d. VERIFY
e. DISPLAY
f. ?

Note that commands and subsequent responses entered by the analyst appear in the permanent storage portion of the Tektronix screen. They can be edited by using a control H which deletes the previous character or the control X which eliminates all input characters on that line.

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[1] From *Image Selection System Operator's Manual.* ESL-IM95 (July 31, 1974), p. 2-3.

ANALYSIS GRID BLOCK COMMANDS[1]

The Analysis Grid Block section is used to specify the grid network, if any to be superimposed on the boundary expression. The grid structure would be useful on a large (i.e., covering several degrees of latitude or longitude) boundary, or on an irregularly shaped boundary. The grid is specified in the following manner:

Prompt	Response	Meaning
ANALYSIS GRID BLOCKS?	YES, NO, or CR	Specify whether or not analysis GRI blocks are to be used. If CR, the minimum-maximum rectangle of the boundary will be used to set up top left (TL) and bottom right (BR).
MAP(M), KEYBOARD(K) OR CROSSHAIR (C)?	M, K, or C	Respond M if the graphics tablet is being used, K if the terminal keyboard is to be used, or C if the crosshair is to be used.
ENTER TL, BR CORNERS	37 0 122 0 36 25 121 42	The lattitude and longitude values of the TL and BR corners of the analysis grid are input, as if by keyboard.
NUMBER OF X AND Y BLOCKS	6 × 4	Specify grid structure. A maximum of 12 grid blocks are allowed along either axis.

[1]From *Image Selection System Operator's Manual.* ESL-IM95 (July 31, 1974), p. 3-20.

DATA INITIALIZER OR DATA DISCRIMINATOR GRID BLOCK SIZE

The command of the Data Initializer or the Data Discriminator will allow subdivision of any rectangular boundary up to a maximum blocking factor of 12 (x-axis) by 12 (y-axis). The following table is provided as a quick reference to indicate the more common, desirable relationships. Those numbers preceded by an asterisk are probably the most useful for mentally equating to any given map/location.

Grid size, blocks per axis	Boundary area per side, in degrees	Grid block size per side, in minutes
2 × 2	1	30
*4 × 4	1	15
4 × 4	2	30
6 × 6	1	10
6 × 6	2	20
*8 × 8	1	7½
*8 × 8	2	15
4 × 8	1 × 2	15
8 × 4	2 × 1	15
12 × 12	1	5
12 × 12	2	10

MANDATORY REQUIREMENTS BOOLEAN LOGIC SYMBOLS[1]

This section describes the selection of imagery by delimiting image descriptor values. Limits are expressed in Boolean form, using a standard set of operators, and the coded image parameters. The valid operators for Boolean expressions are tabulated below. The image parameters and applicable codes are listed elsewhere (in appendices B and C).

Operator	Meaning
+	Or
&	And
=	Equals
<	Less than
>	Greater than
< =	Less than or equal
> =	Greater than or equal
'	Not
(n1,n2)	Inclusive range

To limit on cloud cover less than 20 percent, the following expression would be typed: CC < 2.

To limit on sensor numbers 16 through 20, but not number 18, the following expression would be entered:

SI (16,20) & SI=18'

[1]From *Image Selection System Operator's Manual.* ESL-IM95 (July 31, 1974), p. 3-17.

TABLE B-III.— NASA STANDARD REMOTE SENSOR DATA HANDLING SYSTEM CODES[a]

(a) Platforms

[Abbreviation PL, field number 5]

Code	Description
1	Ames U-2, earth survey aircraft no. 4, tail no. 708
2	Ames U-2, earth survey aircraft no. 5, tail no. 709
3	Ames Convair 990
4	Ames C-141, Starlifter
5	JSC NP3A, earth survey aircraft no. 1, tail no. 927
6	JSC C130, earth survey aircraft no. 2, tail no. 929
7	JSC RB57, earth survey aircraft no. 3, tail no. 925
8	JSC RB57, earth survey aircraft no. 4, tail no. 926
9	Gemini III
10	Gemini IV
11	Gemini V
12	Gemini VI
13	Gemini VII
14	Gemini VIII
15	Gemini IX
16	Gemini X
17	Gemini XI
18	Gemini XII

[a]Table taken from *Data Entry System Operator's Manual for ERAP Data Handling System.* Ames-ERAP Version, ESL-IM86 (June 1974), p. A-4.

TABLE B-III.- NASA STANDARD REMOTE SENSOR DATA HANDLING SYSTEM CODES[a]

(b) Film Format

[Abbreviation FO, field number 8]

Code	Description
1	2.25 in. sq.; (70-mm) frame
2	9 inch sq.; I^2S; 9 in.; 4-band, multispectral, I^2S
3	9-by-9 in. frame
4	9-by-18 in. frame
5	35-mm frame
6	4.5-by-4.5 in. frame
7	2.25-by-7.2 in. panoramic frame
8	4.5-by-50 in. panoramic frame
9	70-mm strip (linescan)
10	90-mm strip (linescan)

[a]From *Data Entry System Operator's Manual for ERAP Data Handling System.* Ames-ERAP Version, ESL-IM86 (June 1974), p. A-11.

TABLE B-III.— NASA STANDARD REMOTE SENSOR DATA HANDLING SYSTEM CODES[a]

(c) Film type

[Abbreviation FT, field number 9]

Code[b]	Description
1	2402 EK plus X Aerographic
2	2424 EK infrared Aerographic
3	2443, 3443 EK Aerochrome infrared
4	3400, S0-022 EK Panatomic X aerial
5	S0242, S0356 EK aerial color (fine resolution)
6	S0397 EK Ektachrome EF Aerographic
7	2490 RAR EK rapid access recording
8	SO 289 EK flat response infrared
9	3404 EK high definition aerial
10	3401 EK plus X aerial
11	2405 EK double X Aerographic
12	2403 EK Tri X
13	2445 EK Aerocolor negative
14	2448 EK Ektachrome MS Aerographic
15	SO-224 EK water penetration
16	SO 127, SO-131 EK high definition aerochrome infrared
17	3414, EK high definition aerial

[a]Data Transformation Corporation. *Earth Resources Data Catalog and Index System Formats and Standard Code Table Control Book.* Jan. 1975. Pp. 2-19 to 2-22.

[b]Codes are given to basic emulsion types which reflect resolution and/or spectral characteristics. Film base is not considered in film code assignments.

TABLE B-III.— NASA STANDARD REMOTE SENSOR DATA HANDLING SYSTEM CODES[a]

(d) Attitude

[Abbreviation AT, field number 32]

Code	Description
1	Vertical image (5 degrees or less from true vertical)
2	Low oblique (more than 5 degrees off true vertical, but horizon not imaged in frame)
3	High oblique (horizon imaged in frame)

[a]From *Data Entry System Operator's Manual for ERAP Data Handling System*. Ames-ERAP Version, ESL-IM86 (June 1974), p. A-24.

TABLE B-III.- NASA STANDARD REMOTE SENSOR DATA HANDLING SYSTEM CODES[a]

(e) Image quality[b]

[Abbreviation QU, field number 32]

Code	Description
1	Excellent
2	Good
3	Fair
4	Poor

[a]From *Data Entry System Operator's Manual for ERAP Data Handling System.* Ames-ERAP Version, ESL-IM86 (June 1974), p. A-25.

[b]Image quality derived from the same image generation as archival at U.S. Department of Interior EROS Data Center Cloud Cover, *not* included as quality parameter except for thin cirrus clouds where overall loss of contrast and detail is apparent.

TABLE B-III.- NASA STANDARD REMOTE SENSOR DATA HANDLING SYSTEM CODES[a]

(f) Image Resolution[b]

[Abbreviation RE, field number 36]

Code	Description
1	Less than 10 feet (3 m) ground-resolved distance. No formal resolution tests made; calculation theoretical.
2	10 to 30 feet (3 to 9 m) ground-resolved distance. No formal resolution tests made; calculation theoretical.
3	30 to 100 feet (9 to 30 m) ground-resolved distance. No formal resolution tests made; calculation theoretical.
4	Greater than 100 feet (6 m) ground-resolved distance. No formal resolution tests made; calculation theoretical.
5	Less than 2 feet (6 m) ground-resolved distance. Resolution measured.
6	2 to 5 feet (0.6 to 7.5 m) ground-resolved distance. Resolution measured.
7	5 to 10 feet (7.5 to 9 m) ground-resolved distance. Resolution measured.

[a]From *Data Entry System Operator's Manual for ERAP Data Handling System.* Ames-ERAP Version, ESL-IM86 (June 1974), p. A-26.

[b]The purpose of this field is to serve as a means of limiting the data to more efficiently search the data base for given requests. It is intended as an aid to the user in selecting general categories of imagery suitable for his purpose, not as an engineering parameter for determining sensor performance.

TABLE B-III.- NASA STANDARD REMOTE SENSOR DATA HANDLING SYSTEM CODES

(g) Reverse look-up table for film type

Kodak type	Film type
2402	1
2403	12
2405	11
2424	2
2443, 3443	3
2445	13
2448	14
2490	7
3400	4
3401	10
3404	9
3414	17
S0-022	4
S0127, S0131	16
S0-224	15
S0242, S0356	5
S0397	6
S0289	8

APPENDIX C

DATA DISCRIMINATOR

TABLE C-I.— DISCRIMINATOR FILE PROCESSING[a]

Input file	File processing commands	Output file	Comments
<named secondary data base <named file #K> <unnamed temporary file> combination of input files	DISPLAY OVRWRT HSTGRM LIST	Display file (graphics, display, or listing)	The active file pointer is moved to the specified input file and the input file is displayed either graphically or as a listing. The input files are unaltered.
<named secondary data base <named file #K> <unnamed temporary file (old)> combination of input files	KEEP ELIMINATE	<unnamed temporary file (new)>	The specified input file is filtered by a Boolean expression and the resultant file is a new unnamed temporary file. The active file pointer is moved to this new temporary file.
<named secondary data base	SAVE	<named secondary data base (new name)>	Only the name of the secondary data base is changed.
<named file #K>	SAVE	<named file #K (new name)>	Only the name of the previously named file is changed.
<unnamed temporary file> combination of input files	SAVE	<named file # n+1>	The unnamed temporary file is named and permanently catalogued.
<named secondary data base> <named file #K> <unnamed temporary file (old)> combination of input files	GRID	<unnamed temporary file (new)>	The specified input file is re-gridded and the resultant file is a new unnamed temporary file. The GRID command should be followed with a SAVE command to form a new named file.

[a]From *Image Selection System Operator's Manual.* ESL-IM95 (July 31, 1974), p. 2-21.

TABLE C-II.— DISCRIMINATOR COMMANDS[a]

Command	Function	Parameter	Default for parameters
		Filter/display	
DISPLAY	Display data on graphics device — options 1 through 10	• Option number for display format (OPT=n) • Boolean expression	Current working data set displayed if no name provided
OVRWRT	Overwrite data on graphics device — options 1 through 10	• Option number for format (OPT=n) • Boolean expression	As above
HSTGRM	Provide histogram of data of specified parameter	• Parameter • Range (optional)	None
KEEP ELIMINATE	Select data meeting specified criteria	• Boolean expression	None
		Data management	
SAVE	Enter data set as a user-named file	• File name • Comments	Must specify name
PURGE	Delete a user-named file from directory	• File name or ALL	None
GRID	Redefine analysis grid structure	• Number of blocks across • Number of blocks down	Number across = 1 Number down = 1
NAMES	List the names of all user files	None	All names listed
LIST	List data set — options 1 through 4	• Format number • Boolean expression	Must specify option number
		Utility	
RECALL	List previous commands	• Number of commands to be listed	1
INIT	Initialize a new session	None	None
QUIT	Stop	None	None
XCISE	Flags the roll in ISS containing an error	• List of roll number	None

[a]From *Image Selection System Operator's Manual.* ESL-IM95 (July 31, 1974), p. 2-12.

TABLE C-III.– COMMAND FIELD FORMAT[a]

<Command field> format	Comments
DISPLAY (OPT=n, <Boolean expression>) OVRWRT	The option number is required, but the [,<Boolean expression>] is optional.
KEEP (<Boolean expression>) ELIMINATE	The <Boolean expression> must be specified.
HISTGRM (<parameter> <Range>)	<Range> may be null.
SAVE (<file name>, <file comments>)	The new <file name> must be specified, but the [,<file comments>] is optional.
PURGE (<file name>)	A single <file name> or ALL may be specified.
GRID (<columns>, <rows>)	Number of <columns> and <rows> in the new secondary data base.
LIST (OPT=n, <Boolean expression>)	The option number must be specified, but the [<Boolean expression>] is optional.
RECALL (<number>)	Number of commands to be recalled.
NAMES INIT QUIT	No parameters.

[a]From *Image Selection System Operator's Manual.* ESL-IM95 (July 31, 1974), p. 2-12.

THE GRID COMMAND[1]

The GRID command allows respecification of the analysis grid structure while in the data discriminator. The command may be applied to the secondary data base, any of the user saved files, or the active temporary file. The format of the command is

<file name> - GRID (N, M),

where N is the number of blocks along the x-axis and M is the number of blocks along the y-axis. As in the data initializer, N and M are restricted to being less than or equal to 12.

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[1]From *Image Selection System Operator's Manual.* ESL-IM95 (July 31, 1974), p. 3-48.

TABLE C-IV.– DISPLAY/OVERWRITE OPTIONS[a]

No.	Display Options	Overwrite options	Comments
1	Analysis grid blocks plus number of frames in each block	Number of frames in each block	Automatic default to system subblocks if no analysis grid blocks specified
2	Analysis grid blocks plus the center points of each frame annotated as an "X"	Center points annotated as an "X"	Automatic default to system subblocks if no analysis grid blocks specified
3	Frame center points annotated as an "X"	Center points as an "X"	
4	Analysis grid blocks plus frame perimeters	Frame perimeters	Automatic default to system subblocks if no analysis grid blocks specified
5	Frame perimeters	Frame perimeters	
6	Display 2 plus crosshairs	Crosshairs search within one analysis grid block	Automatic default to system subblock if no analysis grid blocks specified
7	Display 3 plus crosshairs	Crosshairs search on entire file	
8	Analysis grid block plus center points as dots	Center points as dots	Automatic default to system subblocks if no analysis grid blocks specified
9	Center points as dots	Center points as dots	
10	Display 1 plus list of unique flight numbers in file	List of unique flight numbers in file	Automatic default to system subblocks if no analysis grid blocks specified

[a]From *Image Selection System Operator's Manual.* ESL-IM95 (July 31, 1974), p. 3-26.

TABLE C-V.- CROSSHAIR INTERROGATION KEYBOARD CODES[a]

Keyboard letter	Information display
A	- - - - - roll and frame number
B	- - - - - browse file number
C	- - - - - center coordinates of frame
V	- - - - - coordinates at location at crosshair
F	- - - - - flight number
O	- - - - - outline of frame perimeter
I	- - - - - information fields (roll/frame number, browse file number, flight number, cloud cover, quality, format, flight date, sensor identification, scale, spectral band, and film type)

[a]From *Image Selection System Operator's Manual.* ESL-IM95 (July 31, 1974), p. 3-37.

TABLE C-VI.— LIST DATA PARAMETERS AND OPTION NUMBERS

Data parameter	List options	Data parameter	List options
Flight number	1,2,3,4	Filter	1,4
Flight date	1,2,3,4	Spectral band	1,4
Entry date	1,4	Stereo	1,4
Browse number	1,2,3,4	Map reference	1,4
Center latitude	1,2,3,4	Scale	1,2,3,4
Center longitude	1,2,3,4	Attitude	1,2,3,4
Time	1,4	Quality	1,2,3,4
Number	1,4	Cloud cover	1,2,3,4
Mission number/key	1,4	Altitude	1,4
Platform	1,4	Resolution	1,4
Sensor IDN	1,2,3,4	Coordinate	1,4
Format	1,2,3,4	Roll	1,2,3,4
Film type	1,2,3,4	Frame	1,2,3,4

[a]From *Image Selection System Operator's Manual.* ESL-IM95 (July 31, 1974), p. 3-51.

[b]List options 1, 2, and 4 are off-line; list option 3 is on-line.

TABLE C-VII.– IMAGE PARAMETERS AND APPLICABLE CODES[a]

Field	Name	Code	Field	Name	Code
1	Degrees latitude	DA	28	TL longitude	(b)
2	Tenths of minute latitude	TA	29	BR latitude	(b)
3	Degrees longitude	DO	30	BR longitude	(b)
4	Tenths of minute longitude	TO	31	BL latitude	(b)
5	Year of flight	YF	32	BL longitude	(b)
6	Aircraft flight	AF	33	Scale	SC
7	Day of flight	DF	34	Attitude	AT
8	Year of entry	YE	35	Quality	QU
9	Day of entry	DE	36	Cloud cover	CC
10	Browse cassette	BC	37	Altitude	AL
11	Browse frame	BF	38	Resolution	RE
12	Hour of photograph	HP	39	Sequence	SE
13	Seconds of photograph	SP	40	Coordinate entry	CE
14	Expansion	(b)	41	Roll	RO
15	Expansion	(b)	42	Frame number[c]	FR
16	Expansion	(b)	43	Spectral band high	SH
17	Platform	PL	44	Mission number	MN
18	Sensor identification	SI	45	Expansion	(b)
19	Format	FO	46	Expansion	(b)
20	Film type	FT	5,6[d]	Flight number	FN
21	Filter	FI	5,7[d]	Flight date	FD
22	Spectral band low	SL	8,9[d]	Entry date	ED
23	Stereo	ST	10,11[d]	Browse number	BN
24	Map base	MB	12,13[d]	Time	TI
25	TL latitude	(b)	41,42[d]	Accession number (Ames)	AN
26	TL longitude	(b)			
27	TR latitude	(b)	44,15[d]	Mission flight	MF
			44,41[d]	Mission roll	MR
			44,41, 42	Accession number (JSC)	AC

[a]From *Image Selection System Operator's Manual*. ESL-IM95 (July 31, 1974), p. 3-19.

[b]Not currently available for use in Boolean expressions.

[c]Frame number is a four-digit field, not the nine-digit accession (AN).

[d]These fields are concatenated by ISS and may be referred to by using the corresponding code.