

QUALITY ASSURANCE/QUALITY CONTROL DOCUMENTATION SERIES

TITLE	QUALITATIVE SCENE CODING AND DATA REDUCTION OF 35 MM COLOR SLIDES
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1.0 PURPOSE AND APPLICABILITY

This technical instruction (TI) describes 35 mm slide coding and qualitative data reduction procedures. This TI is referenced in SOP 4420, *Scene Monitoring Qualitative Data Reduction*, and specifically describes:

- 35 mm slide coding procedures for observed meteorological conditions.
- 35 mm slide data reduction for preparation of qualitative analysis summaries.

2.0 RESPONSIBILITIES

2.1 PROJECT MANAGER

The project manager shall provide overall coordination of the coding and data reduction procedures.

2.2 DATA ANALYST

The data analyst shall:

- Oversee slide coding.
- Review and verify slide codes assigned by the data technician.
- Run qualitative summary program software.
- Verify qualitative summary tables.

2.3 DATA TECHNICIAN

The data technician shall:

- Perform slide coding.
- Create digital code files.

3.0 REQUIRED EQUIPMENT AND MATERIALS

Equipment and materials used in coding and reducing 35mm photographic slides include:

- Processed 35 mm slides
- Slide Condition Code Sheet
- Light table
- Hand-held lens
- IBM PC-compatible 386/486 computer system with VGA
- Printer
- ARS software; SS program, HAZE program

4.0 METHODS

This section includes the following two (2) subsections:

- 4.1 35 mm Slide Coding
- 4.2 35 mm Slide Data Reduction

4.1 35MM SLIDE CODING

Not all 35 mm slides undergo the coding process. Slide coding is performed only if summaries of observed slide conditions are required by the contracting agency. Condition codes qualitatively identify weather conditions, observed hazes or plumes, and unusable or missing observations. They are useful for summarizing observed conditions over defined time periods, or in searching for specific observed visibility conditions. Each valid slide that is coded is viewed on a light table with the naked eye and an eight-power, hand-held lens. Criteria used to assign the two-digit code for each slide are presented in Figure 4-1. Codes are recorded directly onto the top center of the slide frame with pencil (see Figure 4-2). The site abbreviation and slide number are also placed on top of the slide frame during the collection, processing, and handling process (refer to TI 4305-4000, *Collection, Processing, and Handling of 35 mm Slide Film*). The codes are later entered into site-specific digital files.

Digital files are created after all slides from a season are coded. Each file contains codes from one site for one season. Standard monitoring seasons are defined as:

<u>Season</u>	<u>Months</u>	<u>Season Code</u>
Winter	(December, January, and February)	1
Spring	(March, April, and May)	2
Summer	(June, July, and August)	3
Fall	(September, October, and November)	4

An IBM PC-compatible computer and the SS program are used to create digital files. Files are named in the format SITEYY.SQO, where SITE is the site abbreviation, YY is the year, and S is the season code. The files include site abbreviation, slide number, date, time, target number, slide condition code, and quality assurance codes; an example digital file is presented as Figure 4-3.

Digital files are created in the SS program (type **SS** at the DOS prompt). The user must first initialize or create a file within the SS program with the commands **SQO** (to enter and operate in the "qualitative only" mode) and **INIT** (to initialize a file). The program then prompts the user for the following information: operator initials, file name, site code, targets used, slide pattern, time codes used, and slide number increment. Figure 4-4 is an example computer screen display during the initialization process.

After initializing a file, the user must then enter the command **TA**. The system will prompt for: slide number, two-digit slide condition code, time code, day, month, and year. Each slide entry will result in the system asking the user if the slide information should be accepted, reentered, or rejected. Figure 4-5 is an example computer screen display during the entry process. When the digital file is complete, type **EXIT** to leave the SS program.

SLIDE CONDITION CODE KEY

SKY CONDITIONS

0 No clouds	No clouds visible anywhere in the sky.
1 Scattered clouds < half of sky	Less than one-half of the sky has clouds present.
2 Overcast > half of sky	More than one-half of the sky has clouds present.
3 Haze concealing scene	Atmospheric haze conditions are such that determination of the sky value is impossible.
5 Weather concealing scene	Clouds or precipitation are such that determination of the sky value is impossible.
8 Observation cannot be determined	Observation cannot be determined due to extreme exposure inconsistencies, lens (or window) condensation, misalignment, or view obstructed by a foreign object.
9 No observation	No observation taken.

LAYERED HAZE

0 No layered haze	No layered haze boundary (intensity of coloration edge) is perceptible.
1 Ground-based layered haze only	Only a single-layered haze boundary is perceptible with the haze layer extending to the surface.
2 Elevated layered haze only	An elevated layered haze with two boundaries is perceptible; e.g., horizontal plume.
3 Multiple haze layers	More than a single ground-based or elevated haze layer is perceptible. This can be multiple ground-based layers or a combination of both.
5 Weather concealing scene	Clouds or precipitation are such that determination of the presence of layered hazes is impossible.
9 No observation or cannot be determined	To be used with sky condition of 9 or if a layered haze value cannot be determined due to reasons other than weather.

NOTE: It is possible to have a sky condition of 5 and still see a layered haze in the scene.

Figure 4-1. Slide Condition Code Key.

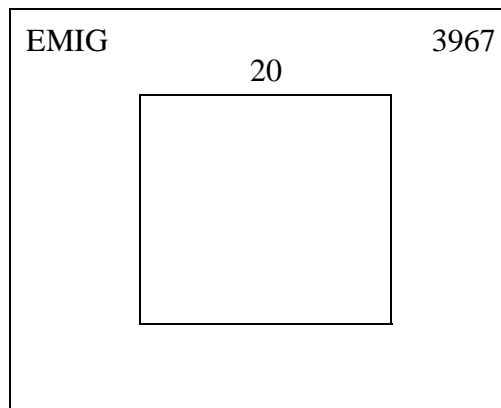


Figure 4-2. Example Slide With Codes.

Column Number					
1	2	3	4	5	6
<u>1234567890123456789012345678901234567890123456789012345678901234</u>					
EMIG 396793101211**20 0 0 0 0.000 0.000902901162520DGBG64*					
EMIG 396793101212**20 0 0 0 0.000 0.000902901162544DGBG64*					
EMIG 396893101221**20 0 0 0 0.000 0.000902901162611DGBG64*					
EMIG 396893101222**20 0 0 0 0.000 0.000902901162640DGBG64*					
EMIG 396993101231**20 0 0 0 0.000 0.000902901162707DGBG64*					
EMIG 396993101232**20 0 0 0 0.000 0.000902901162725DGBG64*					

<u>Columns</u>	<u>Data</u>
1-4	Site abbreviation
5-9	Slide number
10-15	Slide date (year/month/day)
16	Slide time code (1 = 0900, 2 = 1200, 3 = 1500 Local Time)
17	Slide target number
18-19	(Not used)
20-21	Slide condition code
22-45	(Not used)
46-51	Date codes entered (year/day/month)
52-57	Time codes entered (hour/minute/second)
58-60	Data technician initials
61-64	(not used)

Figure 4-3. Key to the Scene Qualitative Only (.SQO) Data File.

2-Digit Code .SQO Slide Analysis Green SS>>	ARS-SQO- 64
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Operator initials, 3 required: JDY	(initials of individual entering data)
Data file name (.SQO will be added): GILA933	(see Section 4.1)
Location code, 4 characters (SITE): GILA	(see Figure 4-3)
Targets to use (1 2 3 4 5): 1	(see Figure 4-3)
Slide pattern (1): 1	(1 if targets are all on same slide)
Time codes to use (1 2 3): 1 2 3	(see Figure 4-3)
Slide number increment (1): 1	(number increments by one)

*New data file GILA933.SQO created

Figure 4-4. Example Initialization Screen in the SS Program.

Slide number, press ESC to quit (1050): Year (93):

	CURRENT	PREVIOUS
Site code.....	GILA	GILA
Slide number.....	1050	1049
Date of photograph.....	93 8 11	93 8 11
Time and target.....	2 1	1 1
Scene visibility code....	21	10
Slide, scene contrast....	0 0	0 0
Sky direct.....	0	0
Clear value.....	0	0
Time of scan.....	12:10:28	12:10:23

*Slide OK? ([Y]es/[R]edo/[N]o scan/[?]help)

Figure 4-5. Example Coding-Entry Screen in the SS Program.

4.2 35 MM SLIDE DATA REDUCTION

Digital files are used to prepare a qualitative summary of observed haze types. Using an IBM PC-compatible computer and the HAZE program, the user is prompted for the following information: number of months to process, the specific months to process, time period for the processing (title), whether to process on a monthly or seasonal basis, file name (.SQO), and the target numbers to process.

The summary is then printed; an example qualitative haze summary table is presented as Table 4-1. When distinct haze layers are visible, they are categorized as ground-based, elevated, or simultaneous ground-based and elevated hazes. All cases where no distinct haze layer occurs are classified as uniform hazes. Cases where the scene is not visible due to haze or weather are also noted. Refer to TI 4520-5000, *Scene Monitoring Reporting of 35 mm Color Slides (IMPROVE Protocol)*, for more detailed discussions of data reporting.

Table 4-1

Example Qualitative Slide Analysis Table

Target	Month	Total Observation	Uniform Haze	Ground-Based Layered Haze	Elevated Layered Haze	Multiple Layers	Target Concealed by Haze	Target Concealed by Weather
POWDER HILL	JUN	88	76	1	0	0	3	11
	JUL	93	82	0	1	0	0	10
	AUG	92	81	1	0	0	13	10
	TOTAL	273 (100%)	239 (88%)	2 (1%)	1 (0%)	0 (0%)	16 (6%)	31 (11%)