SRI International

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A REMOTE VIEWING EVALUATION PROTOCOL (U)

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FIGURES (U)

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I OBJECTIVE (U)

(U) The objective of this task was to develop an evaluation procedure to assess the relative quality of a set of different remote viewing (RV) responses.

II INTRODUCTION (U)

(U) In addressing the remote viewing (RV) evaluation question, we consider two separate requirements:

- Absolute evaluation of a single response for a single unknown target.
- Relative evaluation of a set of responses for a series of known targets.

The first of these is of the most interest in an operational setting. As part of the RV enhancement task, we have considered this problem in two ways. First, by conducting an operational RV session between two calibration RV sessions, a tentative a priori assessment of operational efficacy can be determined. The evaluation is made on the basis of performance during the calibration sessions, and on the basis of adherence to a predetermined session structure.

(U) A second technique for an a priori evaluation was explored as part of the Fiscal Year 1982 program in an audio-linguistic task. This task provided indications that careful linguistic analysis, when coupled with technical audio analysis, could yield an assessment in the absence of knowledge about the target.

(U) Various techniques have been used in the past[1]* in an attempt to solve the relative evaluation problem. The most common of these was the simple rank ordering of all responses, as assessed against all possible targets used in an experimental series. In this procedure, a judge is presented with n RV transcripts and n target sites. His task is to arrange

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*(U) References are listed at the end of this report.

(U)

the transcripts in order of the best to least match for each of the n targets. A simple numerical counting procedure is then used to estimate the likelihood that the judge's transcript/target matches are by chance alone.[2] This early technique contained little systematic structure for determining the final order of matches.

The first step toward systematizing the rank order judging procedure was to preprocess the raw data in the transcript by "conceptualizing" both the verbal and the pictorial responses. Conceptualizing a transcript requires an analyst to paraphrase the transcript into a list of coherent statements. This concept list is then compared and scored concept-by-concept to each of the targets in the experiment. The resulting scores are averaged for each response, and all responses are rank-ordered on the basis of these scores.[3] This improved analysis procedure was applied to a number of experiments within the Technology Transfer Task [redacted]

(U) The problem with the above technique is that there are no guidelines as to how the analyst should paraphrase the transcript; furthermore, the method in which the concepts are to be assessed against the targets remains undefined. The purpose of the Evaluation Task in FY 1982 was to identify a procedure that corrected these deficiencies.

III ANALYSIS PROTOCOL (U)

(U) To quantify the analysis procedure, we have divided the task into four separate areas: subject response, target/task definition, quality assessment, and numerical analysis. Figure 1 is a sample RV Assessment Form that has been designed to emphasize the separation of the analysis tasks. Each of the parts of the form are described below.

(U) The subject's response should be prepared for analysis without any knowledge of either the target site or the overall task. The aim of this method of response preparation is to reduce a possibly redundant, rambling response to a coherent set of concepts. To meet this requirement we have developed a set of initial guidelines to the conceptualization procedure.

(U) A concept is defined as a paraphrase of a single idea that has been expressed in the RV verbal or drawing response. That coherent idea should not be fragmented into component parts. For example, a response might be of the form, "I see a large, textured, gray building." The single concept that expresses this idea should be "large, textured, gray building," rather than four separate concepts--one for each word in the phrase. Each concept should be entered under the "Transcript Concept" column in the RV Assessment Form.

(U) For this initial evaluation technique, a particular concept should be used only once in the analysis. (Some weighting factor proportional to concept frequency could be utilized, but, for the initial attempt, only unique concepts are used.) If in the construction of the transcript concept list a concept later in the transcript is a duplicate of an earlier one, it should be so noted by placing the concept number of the original concept in the "D" column.

Begin Time: _____ Target: _____ Viewer: _____

End Time: _____ Method of Targeting: _____ Date: _____

Length of Session: _____ Session: _____ Class: _____

TRANSCRIPT EVALUATION

Concept Number	Transcript Concept	D	P	Element of Target	Relevance (R)	Quality (Q)	Score
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

PxRxQ	Score	Normalized Score
0	0	0.00
1	1	0.36
2	2	0.71
3	3	1.07
4	4	1.43
5	5	1.79
6	6	2.14
8	7	2.50
9	8	2.86
10	9	3.21
12	10	3.57
15	11	3.93
16	12	4.29
20	13	4.64
25	14	5.00

Score	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
# of Concepts															

Weighted Average	

FIGURE 1 SAMPLE RV ASSESSMENT FORM (U)

(U) To utilize an analysis procedure that is capable of quantitative assessment, it is necessary to define, in advance, what the goals of the assessment are. In the RV Assessment Form, columns "Element of Target" and "Relevance" are provided to clearly define the goal of the analysis. In the ideal situation, an RV target should be completely specified in advance. A target typically consists of a number of target elements, each of which may have varying relevance with regard to the overall RV task. For any given target, an independent list of target elements should be prepared. The selection of what constitutes a target element, is left completely to the discretion of the task coordinator. The target element must be selected with little regard to task relevance (target element relevance is accounted for later). Because an RV target consists, in principle, of an essentially infinite number of possible elements, discretion needs to be exercised in the selection process.

(U) For each target element identified for the site, the task coordinator must define a relevance rating. This rating allows the coordinator to tailor the analysis to the task requirements. Table 1 shows the scale that is used for the target element relevance rating.

Table 1

(U) TASK-DEFINED RELEVANCE SCALE FOR TARGET ELEMENTS (U)

Rating	Relevance Scale
1	A target element of trivial interest
2	A target element of minor interest
3	A target element of intermediate interest
4	A target element of major interest
5	A target element of key interest

(U) For each transcript concept on the RV Assessment Form (Figure 1), the analyst should attempt to find the element on the list of target elements that he/she considers to be the best match. The analyst should be quite liberal in the concept/element matching (i.e., the quality of the match should be considered at this point in the analysis). If he/she is able to identify a target element that might be considered a match to the given concept, a 1 is placed in the "p" (present) column on the assessment form. If no element can be identified, a 0 is placed in the "p" column. After making a target element identification, the selected target element, and its corresponding overall relevance rating should be entered in the appropriate columns on the assessment form.

(U) Having identified a corresponding target element for each concept, it is now appropriate to assess the quality of the match. The quality assessment is done on the basis of how well the single concept in question matches the selected target element. The judgement is to be made without regard to any other issues, such as importance of the concept to the transcript, or importance (relevance) of the target element to the target. Table 2 shows the quality assessment scale that is used for this part of the analysis. The appropriate quality score from Table 2 is entered in the "Quality" column on the RV Assessment Form for each concept for which a matching target element has been identified.

(U) An intermediate numerical score is computed for each concept from the relevance and quality (Tables 1 and 2) evaluation as follows:

$$S' = P \times R \times Q \quad ,$$

where P is the value in the "p" column (0 or 1); R is the relevance evaluation; and Q is the quality assessment. S' can assume values ranging between 0 and 25. Table 3 demonstrates how to determine the final score, S, for a given value of S' for each concept. The conversion table is

Table 2

(U) QUALITY ASSESSMENT SCALE (U)

Rating	Discrimination Scale
1	Poor description; only one or two aspects of the material match.
2	Fair description; a few aspects of the material match, but a large ambiguity exists.
3	Reasonable description; many aspects of the material match, but there remains some ambiguity.
4	Good description; a large number of aspects of the material matches, but it is possible to conceive of material that would be a better match.
5	Excellent description; all or nearly all aspects of the material match.

Table 3

(U) NUMERICAL SCORE CONVERSION TABLE (U)

S = P × R × Q	Score	Normalized Score
0	0	0.00
1	1	0.35
2	2	0.71
3	3	1.07
4	4	1.43
5	5	1.79
6	6	2.14
8	7	2.50
9	8	2.86
10	9	3.21
12	10	3.57
15	11	3.93
16	12	4.29
20	13	4.64
25	14	5.00

(U)
used to eliminate the nonuniformly-distributed gaps in scoring numbers that occur if one simply uses the product S′. Thus, the final score for each concept ranges from 0 to a maximum of 14. This conversion table is provided as part of the RV Assessment Form.

(U) If an assessment of an individual concept is required, the final score for each concept/target-element match can be related to the quality assessment scale by using the conversions shown in the third column of Table 3 and on the assessment sheet. It should be noted, however, that the integer scores are used to simplify the remaining calculations.

(U) To determine a final evaluation of the complete transcript assessed against a given target, a weighted average of concept scores is computed. To assist in the calculation of the weighted average, a tally box score is provided at the bottom of the RV Assessment Form. For each of the possible scores, 0 through 14, the number of concepts that attained that particular score are counted. For example, if 3 concepts were evaluated with a score of 12, a 3 is entered in the 12 score. If the frequency of occurrence of score S_j is f_j, then the final weighted average is computed by

$$A_k' = \Sigma f_j \sqrt{f_j} \times S_j / \Sigma f_j \sqrt{f_j} \quad .$$

$$A_k = 0.357 A_k'$$

(U) The normalized, weighted average score, A_k, is entered in the weighted average box on the assessment sheet. The weighted average score has been normalized to be within the range

$$0 \leq A_k \leq 5.0 \quad .$$

To aid in the interpretation of the result, the quality assessment scale (Table 2) can be used to assess quality of the match between the whole RV response and the given target site.

(U) At this point in the evaluation protocol, the following options are available, depending on the task requirement:

(U)

- An n X n rank ordering on the basis of the weighted averages.
- A simple selection of the best match.
- A statistical evaluation on a concept-by-concept basis.

IV CONCLUSIONS (U)

A protocol has been developed to address the relative evaluation portion of the overall RV transcript assessment problem. As a demonstration of the technique, we provide in Appendix A an analysis of a series of four remote viewings that were performed as calibrations [redacted]. In this series the remote viewing products were of relatively high quality, but nonetheless require a sensitive technique to differentiate because of the similarity of the targets and, hence, of the descriptions. (The series was chosen primarily for that reason.) Application of the assessment technique resulted in the correct blind matching (highest scoring in matches versus cross matches) of three of the four.

(U) Appendix B is a one page, step-by-step procedure for the application of this evaluation technique.

(U) The material in this document thus constitutes an instruction manual or protocol for application of a step-by-step procedure for quantitative assessment of the relative target/transcript correlations of a series of transcripts matched into a series of targets.

Appendix A

EVALUATION OF FOUR COORDINATE REMOTE VIEWINGS (U)

On 14 December 1981, four coordinate remote viewings were conducted as calibrations.

These four calibrations were chosen as a test bed for the evaluation procedure for the following reasons, (1) they were conducted in an application setting, and (2) the targets had many similar features, and would thus provide a sensitive test of the protocol.

Figures A-1 through A-4 are the transcripts that were presented to the analyst. They are exactly as they were when collected, except that the coordinates have been removed. Figures A-5 through A-8 are the National Geographic magazine targets that were used during the calibration sessions. Finally, the task coordinator provided Tables A-1 through A-4 as target element relevance scales for the four targets in Figures A-5 through A-8. This completes the information that was given to the analyst, and thus the analysis was carried out blind as to the matching target/transcript pairs.

(U) Table A-5 is a compilation of the completed work sheets that were used by the analyst in this evaluation. They are shown in groups by session number, and alphabetized on the four targets. (The task coordinator first randomized the transcript order then assigned the session number used above.) For each of the transcripts, the analyst simply included all phrases and all drawings as concepts. For example, seven concepts were found during Session 2.

(U) All concepts were then analyzed as described in the text. The matching target element, its relevance rating, and the computed score are shown for all possible combinations of transcript/target pairs in Table A-5. The score distributions and their resulting weighted averages are also shown in Table A-5.

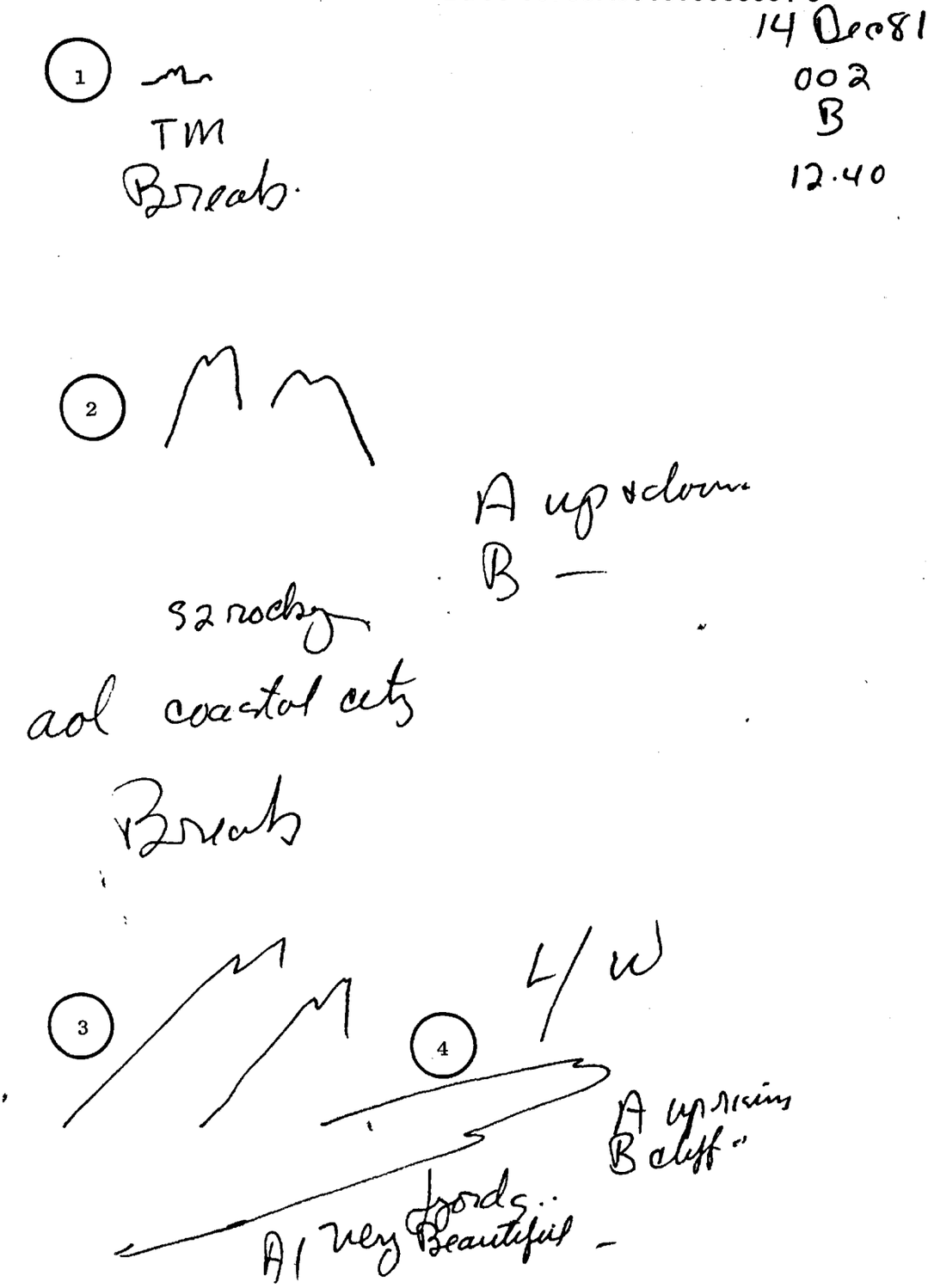


FIGURE A-1 TRANSCRIPT 1 (U)

14 Dec 81
002
B
3.23

Aol London
7777
Breab.

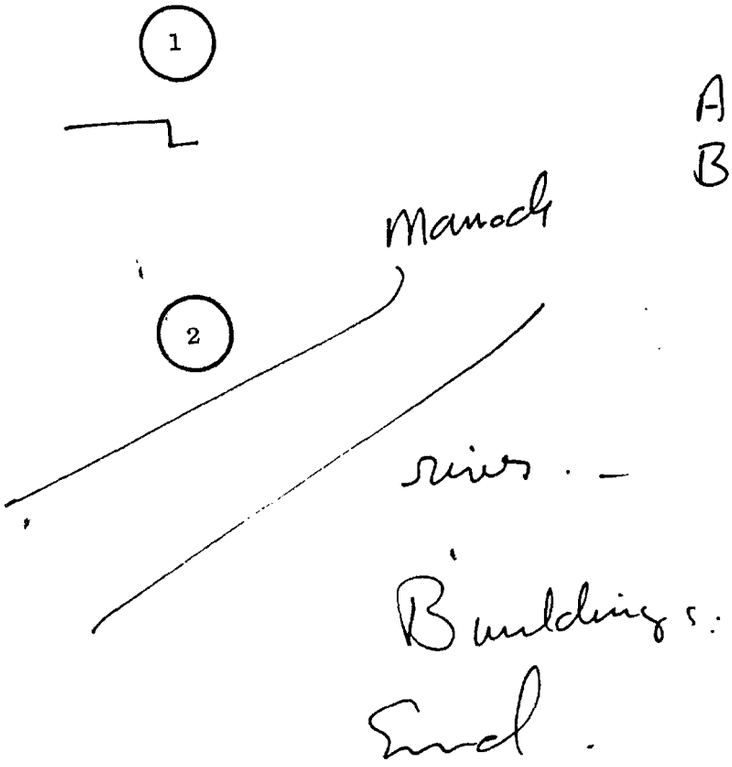


FIGURE A-2 TRANSCRIPT 2 (U)

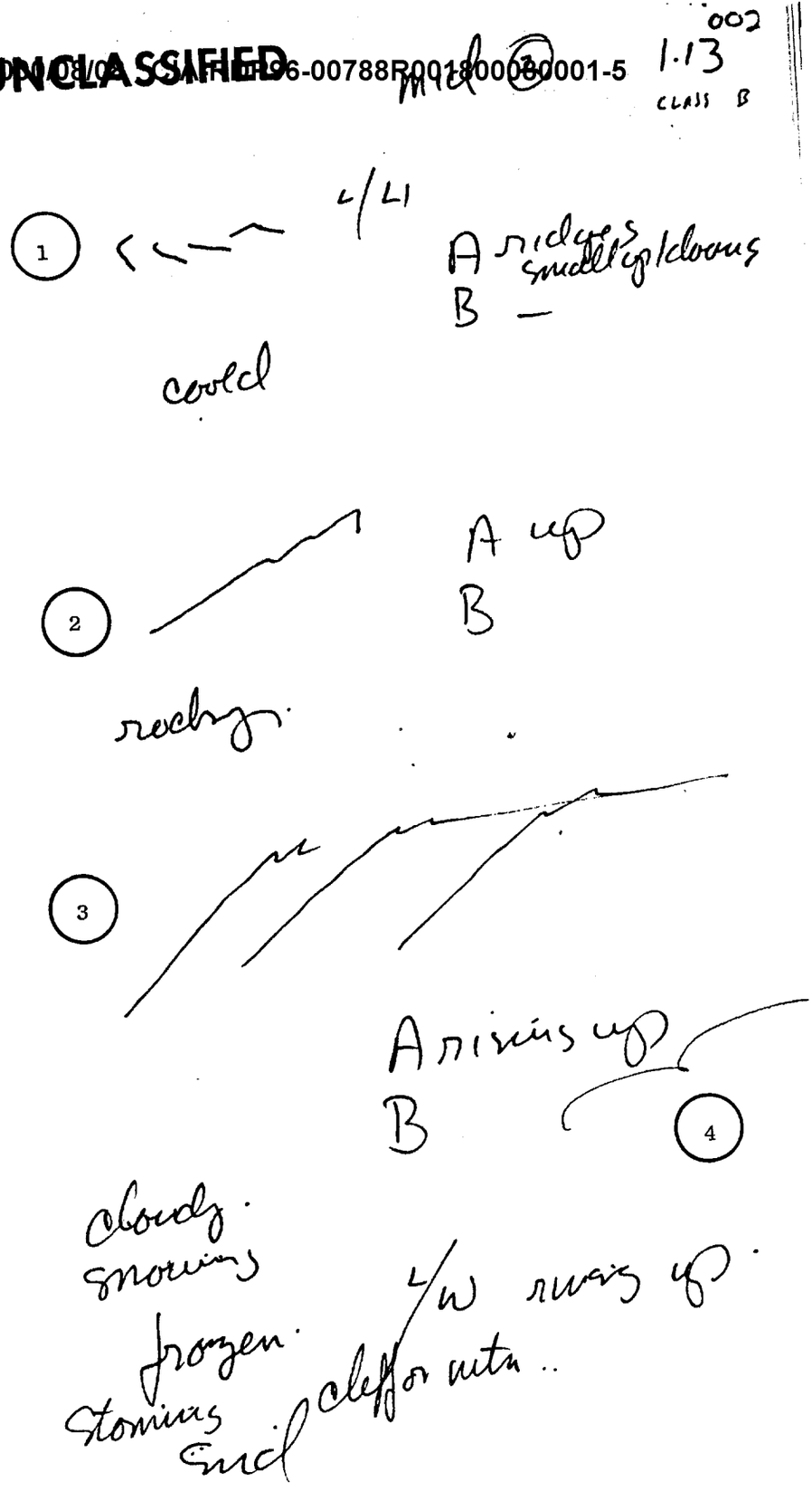


FIGURE A-3 TRANSCRIPT 3 (U)

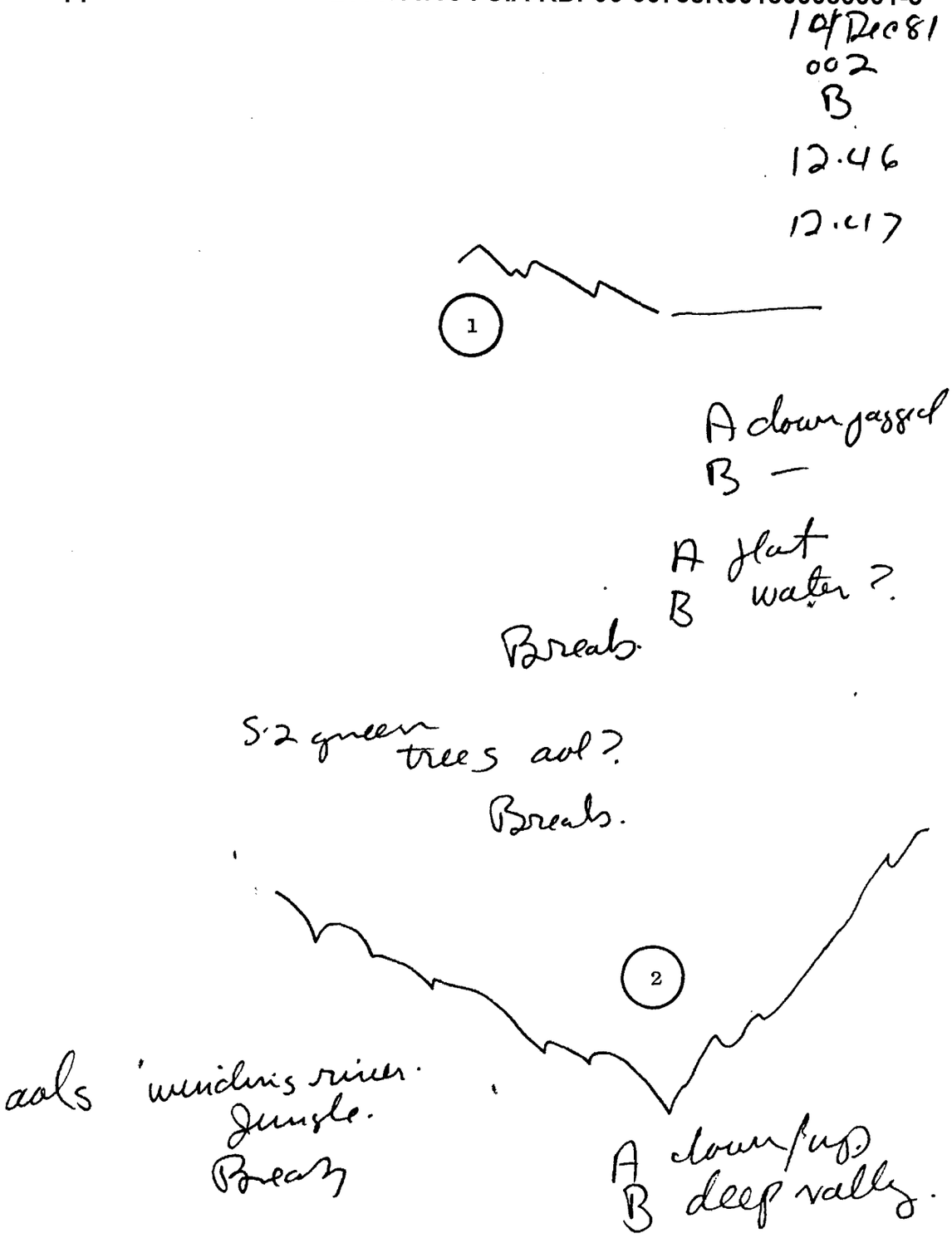


FIGURE A-4(a) TRANSCRIPT 4 (U)

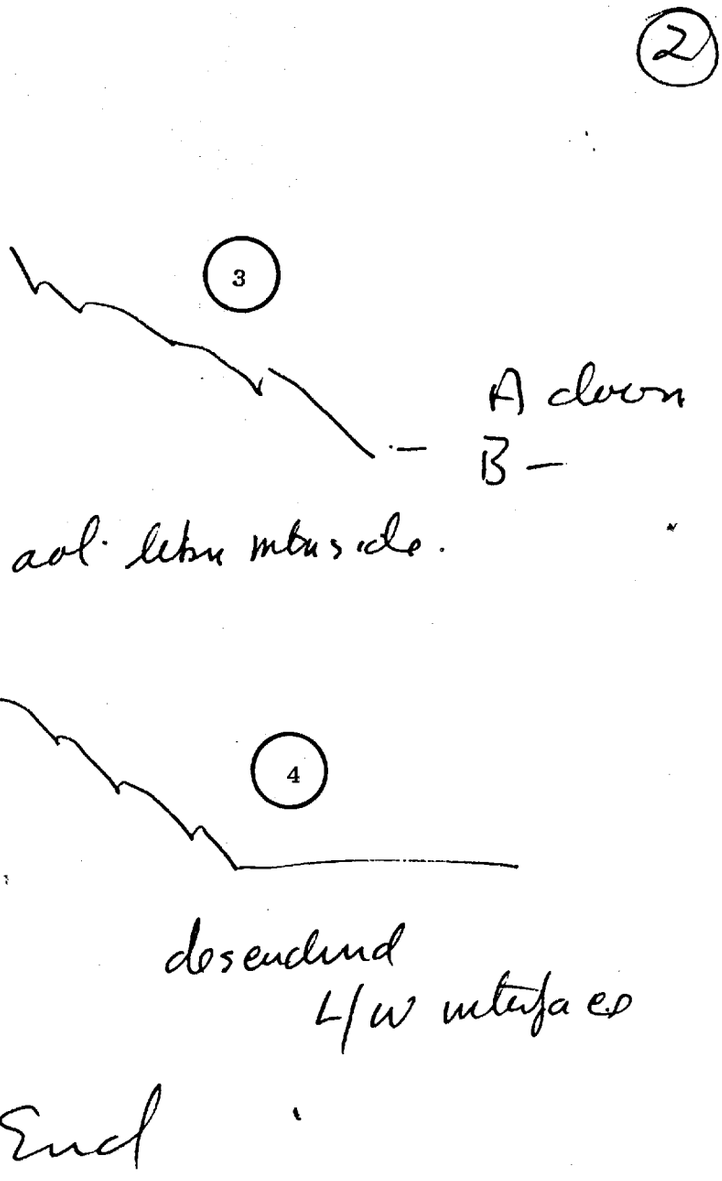


FIGURE A-4(b) TRANSCRIPT 4 (concluded) (U)

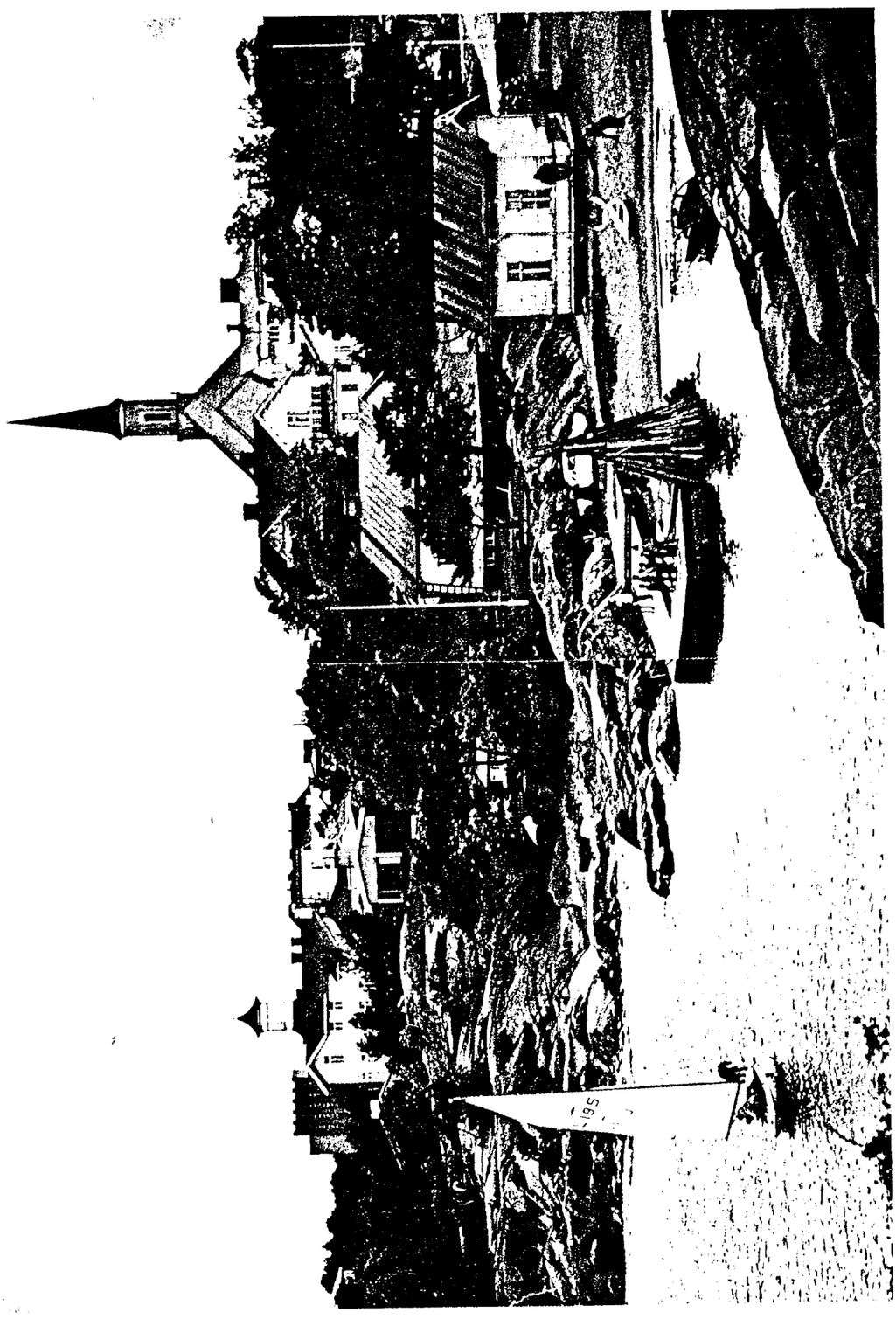


FIGURE A-5 TARGET SITE HANGÖ (U)

UNCLASSIFIED

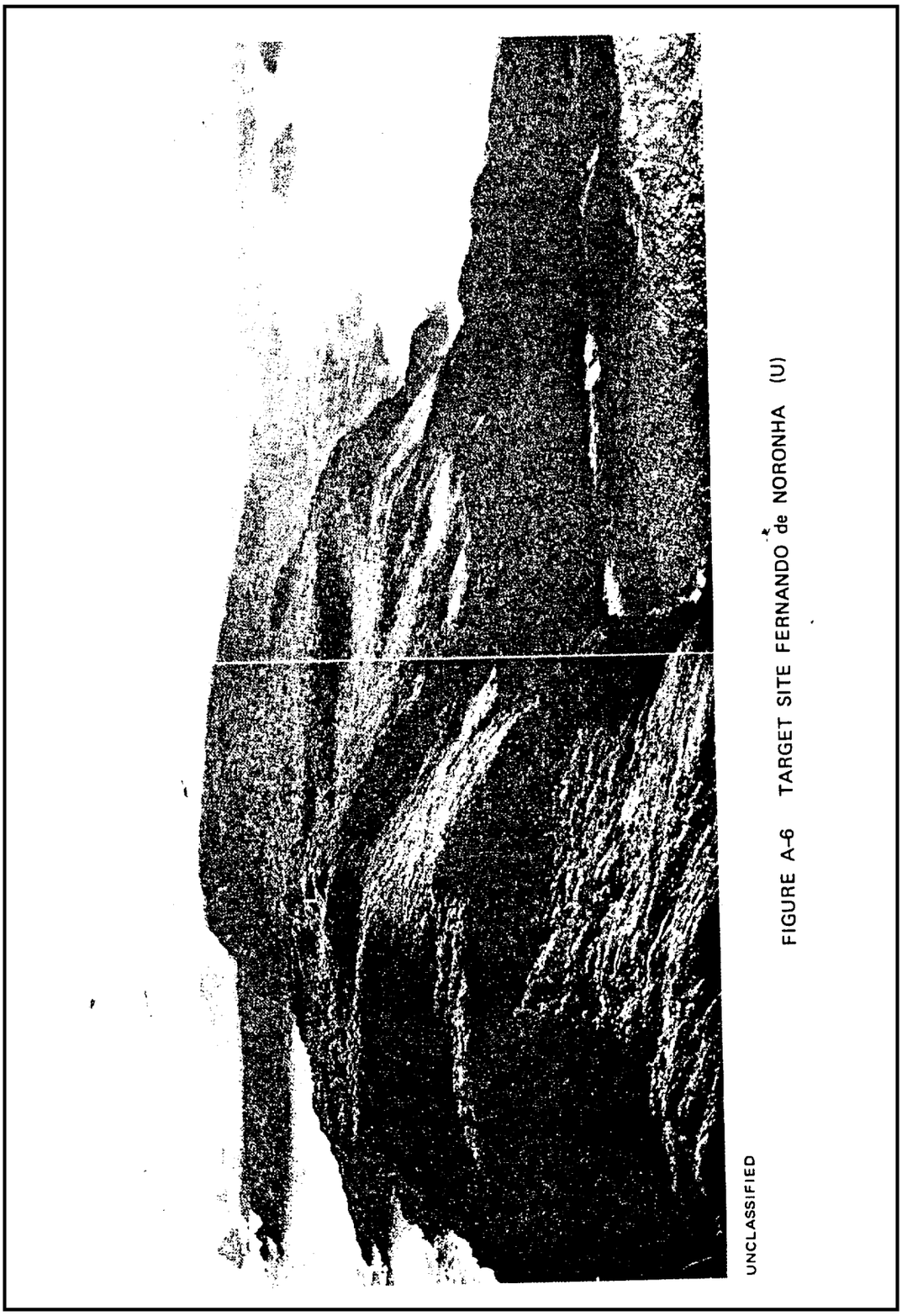
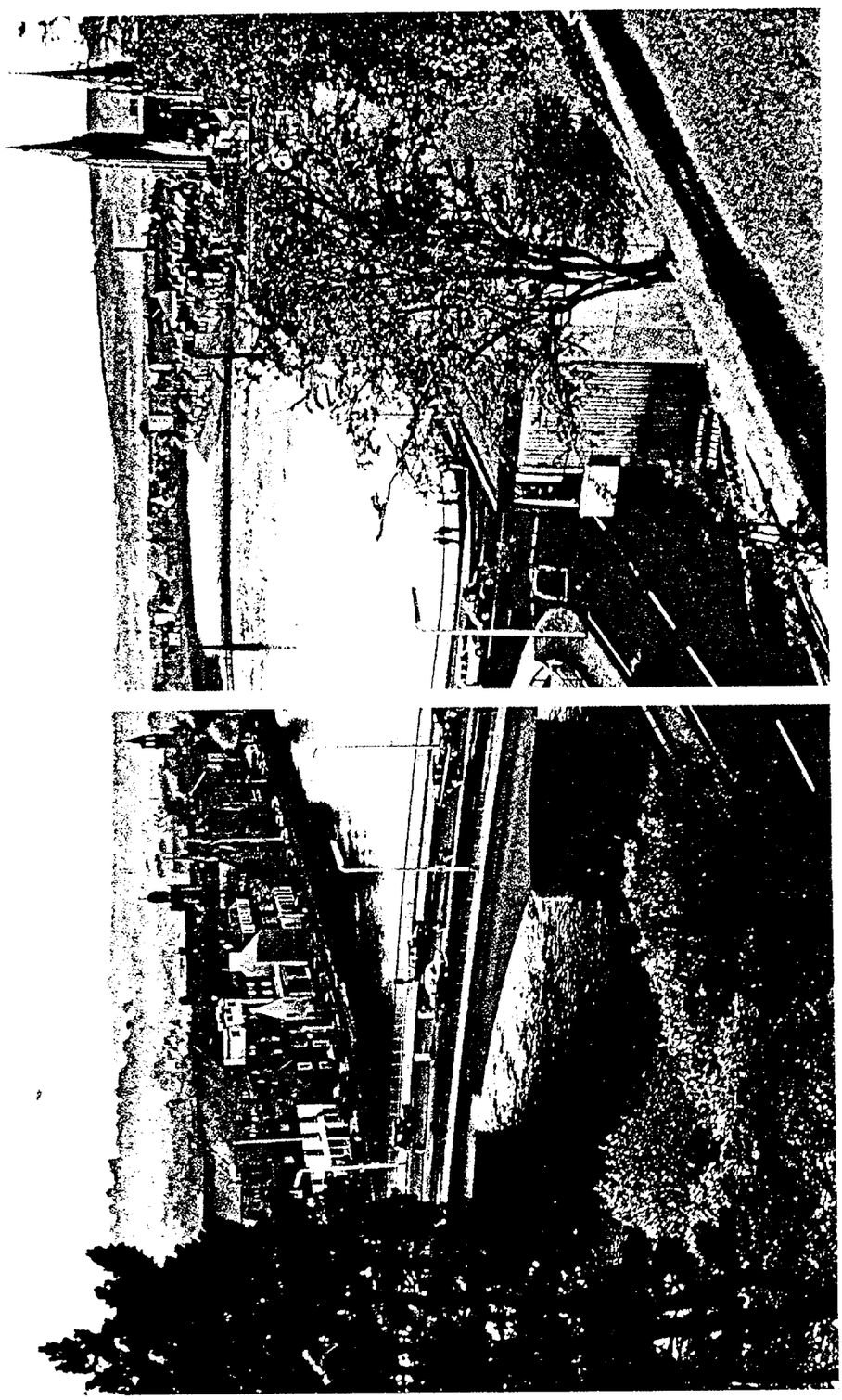


FIGURE A-6 TARGET SITE FERNANDO de NORONHA (U)

CPYRGHT

UNCLASSIFIED



UNCLASSIFIED

FIGURE A-7 TARGET SITE INVERNESS (U)

UNCLASSIFIED

UNCLASSIFIED

FIGURE A-8 TARGET SITE PUNKAHARJU (U)

Table A-1

(U) TARGET ELEMENT RELEVANCE RATINGS FOR HANGÖ (U)

Target Element	Relevance
Town	5
Cold	4
Peninsula	5
Rocky	3
Vegetation	2
Bay	3

Table A-2

(U) TARGET ELEMENT RELEVANCE RATINGS FOR INVERNESS (U)

Target Element	Relevance
City	5
River	4
Bridge	3
River banks	2
Vegetation	1

Table A-3

(U) TARGET ELEMENT RELEVANCE RATINGS
FOR FERNANDO DE NORONHA (U)

Target Element	Relevance
Island	5
Surf	3
Hills	4
Uninhabited	3
Mountain peak	3
Temperate climate	2
Vegetation	2
Ocean	4

Table A-4

(U) TARGET ELEMENT RELEVANCE RATINGS
FOR PUNKAHARJU (U)

Target Element	Relevance
Connect lakes	5
Town	4
Bridges	2
Cold	4
Vegetation	1
Islands	4

Begin Time: 12:40 Target: Inverness Viewer: #002

End Time: Method of Targeting: Coordinates Date: 14 December 1981

Length of Session: Session: 1 Class: B

TRANSCRIPT EVALUATION

Concept Number	Transcript Concept	D	P	Element of Target	Relevance (R)	Quality (Q)	Score	PxRxQ	Score
1	Picture 1		1	Twin church towers	1	1	1	0	0
2	Picture 2	1						1	1
3	Up and down		1	Buildings	5	1	5	2	2
4	Rocky		0				0	3	3
5	Land/water interface		1	River	4	4	12	4	4
6	Picture 3		1	Twin church towers	1	1	1	5	5
7	Picture 4		1	River	4	4	12	6	6
8	Uprising		1	Buildings	5	1	5	8	7
9	Cliff		0				0	9	8
10	Fjords		1	River	5	1	5	10	9
11	Coastal city		1	City	5	4	20	12	10
12								15	11
13								16	12
14								20	13
15								25	14

Score	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
# of Concepts	2	5			3	3							2	1	

Weighted Average	1.53

TABLE A-5 RV ASSESSMENT FORMS FOR CALIBRATION OF REMOTE VIEWING (U)

Approved For Release 2000/08/08 : CIA-RDP96-00788R001800080001-5

UNCLASSIFIED

TRANSCRIPT EVALUATION

Begin Time: 12:40 Target: Hangö Viewer: #002

End Time: Method of Targeting: Coordinates Date: 14 December 1981

Length of Session: Session: 1 Class: B

Concept Number	Transcript Concept	D	P	Element of Target	Relevance (R)	Quality (Q)	Score
1	Picture 1		1	Rocks	3	3	8
2	Picture 2	1					
3	Up and down		1	Buildings	5	1	5
4	Rocky		1	Rocks	3	5	11
5	Land/water interfaces		1	Coast	5	4	13
6	Picture 3		1	Church	2	1	2
7	Picture 4		1	Bay	3	2	6
8	Uprising		1	Slope of land	3	1	3
9	Cliff		1	Coast	5	2	9
10	Fjords		1	Bay	3	1	3
11	Coastal city		1	City	5	5	14
12							
13							
14							
15							

PxRxQ	Score
0	0
1	1
2	2
3	3
4	4
5	5
6	6
8	7
9	8
10	9
12	10
15	11
16	12
20	13
25	14

Score	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
# of Concepts		4	2	1	1	2	1		1	1		1		1	1

Weighted Average	2.52

Table A-5 (continued)

TRANSCRIPT EVALUATION

Begin Time: 12:40 Target: Fernando de Noronha Viewer: #002

End Time: Method of Targeting: Coordinates Date: 14 December 1981

Length of Session: Session: 1 Class: B

Concept Number	Transcript Concept	D	P	Element of Target	Relevance (R)	Quality (Q)	Score	PxRxQ	Score
1	Picture 1		1	Hills	4	4	12	0	0
2	Picture 2	1						1	1
3	Up and down		1	Peak	3	1	3	2	2
4	Rocky		1	Coast line	1	5	5	3	3
5	Land/water interface		1	Island	5	4	13	4	4
6	Picture 3		1	Peak	3	2	6	5	5
7	Picture 4		1	Island	5	1	5	6	6
8	Uprising		1	Hills	4	2	7	8	7
9	Cliff		1	Peak	5	3	11	9	8
10	Fjords		1	Inlets	3	2	6	10	9
11	Coastal city		0				0	12	10
12								15	11
13								16	12
14								20	13
15								25	14

Score	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
# of Concepts	1	2	3	1	3	1	2	1				1	1	1	

Weighted Average	2.36

Table A-5 (continued)

Begin Time: 12:40 Target: Punkaharju Viewer: #002

End Time: Method of Targeting: Coordinates Date: 14 December 1981

Length of Session: Session: 1 Class: B

TRANSCRIPT EVALUATION

Concept Number	Transcript Concept	D	P	Element of Target	Relevance (R)	Quality (Q)	Score	PxRxQ	Score
1	Picture 1		0				0	0	0
2	Picture 2	1	0					1	1
3	Up and down		1	Town	4	1	4	2	2
4	Rocky		0				0	3	3
5	Land/water interface		1	Connected lakes	5	4	13	4	4
6	Picture 3		0				0	5	5
7	Picture 4		1	Connected lakes	5	2	9	6	6
8	Uprising		0				0	8	7
9	Cliff		0				0	9	8
10	Fjords		1	Connected lakes	5	1	5	10	9
11	Coastal city		1	Town	4	3	10	12	10
12								15	11
13								16	12
14								20	13
15								25	14

Score	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
# of Concepts	5	2	1	1	1	1				1	1			1	

Weighted Average	0.90

Table A-5 (continued)

Begin Time: 15:23 Target: Inverness Viewer: #002

End Time: Method of Targeting: Coordinate Date: 14 December 1981

Length of Session: Session: 2 Class: B

TRANSCRIPT EVALUATION

Concept Number	Transcript Concept	D	P	Element of Target	Relevance (R)	Quality (Q)	Score
1	Picture 1		1	River bank	4	3	10
2	Straight angles		1	Buildings	5	1	5
3	Picture 2		1	River	4	3	10
4	River		1	River	5	5	14
5	Buildings		1	Buildings	5	5	14
6	Man-made		1	City	5	4	13
7	London		1	City	5	4	13
8							
9							
10							
11							
12							
13							
14							
15							

PxRxQ	Score
0	0
1	1
2	2
3	3
4	4
5	5
6	6
8	7
9	8
10	9
12	10
15	11
16	12
20	13
25	14

Score	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
# of Concepts		1		2	2	2					2			2	2

Weighted Average	4.13

Table A-5 (continued)

Begin Time: 15:23 Target: Hangö Viewer: #002

End Time: Method of Targeting: Coordinate Date: 14 December 1981

Length of Session: Session: 2 Class: B

TRANSCRIPT EVALUATION

Concept Number	Transcript Concept	D	P	Element of Target	Relevance (R)	Quality (Q)	Score
1	Picture 1		1	Buildings	5	1	5
2	Straight angles		1	Buildings	5	1	5
3	Picture 2		1	Peninsula	5	1	5
4	River		1	Bay	3	2	6
5	Buildings		1	Buildings	5	5	14
6	Man-made		1	Buildings	5	4	13
7	London		1	Town	5	3	11
8							
9							
10							
11							
12							
13							
14							
15							

PxRxQ	Score
0	0
1	1
2	2
3	3
4	4
5	5
6	6
8	7
9	8
10	9
12	10
15	11
16	12
20	13
25	14

Score	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
# of Concepts		3	1	1	1	1						1		1	1

Weighted Average	2.72

Table A-5 (continued)

Begin Time: 15:23 Target: Fernando de Noronha Viewer: #002

End Time: Method of Targeting: Coordinate Date: 14 December 1981

Length of Session: Session: 2 Class: B

TRANSCRIPT EVALUATION

Concept Number	Transcript Concept	D	P	Element of Target	Relevance (R)	Quality (Q)	Score
1	Picture 1		0				0
2	Straight angles		0				0
3	Picture 2		1	Island	5	1	5
4	River		1	Ocean	3	1	3
5	Buildings		0				0
6	Man-made		0				0
7	London		0				0
8							
9							
10							
11							
12							
13							
14							
15							

PxRxQ	Score
0	0
1	1
2	2
3	3
4	4
5	5
6	6
8	7
9	8
10	9
12	10
15	11
16	12
20	13
25	14

Score	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
# of Concepts	5	2		1		1									

Weighted Average	0.22

Table A-5 (continued)

Begin Time: 15:23 Target: Punkaharju Viewer: #002

End Time: Method of Targeting: Coordinate Date: 14 December 1981

Length of Session: Session: 2 Class: B

TRANSCRIPT EVALUATION

Concept Number	Transcript Concept	D	P	Element of Target	Relevance (R)	Quality (Q)	Score
1	Picture 1		1	Bridge	2	1	2
2	Straight angles		1	Bridge	2	1	2
3	Picture 2		1	Bridge	2	1	2
4	River		1	Lakes	5	2	9
5	Buildings		1	Town	4	5	13
6	Man-made		1	Town	4	4	12
7	London		1	Town	4	3	10
8							
9							
10							
11							
12							
13							
14							
15							

PxRxQ	Score
0	0
1	1
2	2
3	3
4	4
5	5
6	6
8	7
9	8
10	9
12	10
15	11
16	12
20	13
25	14

Score	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
# of Concepts		3	1	1	1	1				1	1		1	1	

Weighted Average	2.11

Table A-5 (continued)

Begin Time: 13:13 Target: Inverness Viewer: #002

End Time: Method of Targeting: Coordinates Date: 14 December 1981

Length of Session: Session: 3 Class: B

TRANSCRIPT EVALUATION

Concept Number	Transcript Concept	D	P	Element of Target	Relevance (R)	Quality (Q)	Score	PxRxQ	Score
1	Picture 1		1	Buildings	5	1	5	0	0
2	Land/water interface		1	River	4	4	12	1	1
3	Ridges		0				0	2	2
4	Small ups and downs		1	Buildings	5	1	5	3	3
5	Cold		1	Location	3	1	3	4	4
6	Picture 2		1	Church	2	1	2	5	5
7	Rocky		0				0	6	6
8	Picture 3		1	Buildings	5	1	5	8	7
9	Picture 4		0				0	9	8
10	Frozen		0				0	10	9
11	Feeling of town		1	City	5	4	13	12	10
12	Cliff on water		1	River bank	1	1	1	15	11
13								16	12
14								20	13
15								25	14

Score	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
# of Concepts	4	6	1	1	2	3							1	1	

Weighted Average	1.12

Table A-5 (continued)

Begin Time: 13:13 Target: Hangö Viewer: #002

End Time: Method of Targeting: Coordinates Date: 14 December 1981

Length of Session: Session: 3 Class: B

TRANSCRIPT EVALUATION

Concept Number	Transcript Concept	D	P	Element of Target	Relevance (R)	Quality (Q)	Score	PxRxQ	Score
1	Picture 1		1	Rocks	3	2	6	0	0
2	Land/water interface		1	Peninsula	5	4	13	1	1
3	Ridges		1	Rocks	3	2	6	2	2
4	Small ups and downs		1	Rocks	3	2	6	3	3
5	Cold		1	Location	4	4	12	4	4
6	Picture 2		1	Church	2	1	2	5	5
7	Rocky		1	Rocks	3	5	11	6	6
8	Picture 3		1	Sloping rocks	3	2	6	8	7
9	Picture 4		0				0	9	8
10	Frozen		1	Location	4	4	12	10	9
11	Feeling of town		1	Town	5	5	14	12	10
12	Cliff on water		1	Sloping rocks	3	2	6	15	11
13								16	12
14								20	13
15								25	14

Score	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
# of Concepts	1	1	5		3	2	5					1	2	1	1

Weighted Average	2.65

Table A-5 (continued)

Begin Time: 13:13 Target: Fernando de Noronha Viewer: #002

End Time: Method of Targeting: Coordinates Date: 14 December 1981

Length of Session: Session: 3 Class: B

TRANSCRIPT EVALUATION

Concept Number	Transcript Concept	D	P	Element of Target	Relevance (R)	Quality (Q)	Score	PxRxQ	Score
1	Picture 1		1	Hills	4	2	7	0	0
2	Land/water interface		1	Island	5	4	13	1	1
3	Ridges		1	Hills	4	5	13	2	2
4	Small ups and downs		1	Hills	4	3	12	3	3
5	Cold		0				0	4	4
6	Picture 2		1	Peak	3	3	8	5	5
7	Rocky		1	Shoreline	3	2	6	6	6
8	Picture 3		1	Hills	4	3	10	8	7
9	Picture 4		1	Surf	3	1	3	9	8
10	Frozen		0				0	10	9
11	Feeling of town		0				0	12	10
12	Cliff on water		1	Hills by sea	4	5	13	15	11
13								16	12
14								20	13
15								25	14

Score	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
# of Concepts	3	1	2	3	1	2	1	1	1		2		3		

Weighted Average	2.49

Table A-5 (continued)

Begin Time: 13:13 Target: Punkharaja Viewer: #002

End Time: Method of Targeting: Coordinates Date: 14 December 1981

Length of Session: Session: 3 Class: B

TRANSCRIPT EVALUATION

Concept Number	Transcript Concept	D	P	Element of Target	Relevance (R)	Quality (Q)	Score	PxRxQ	Score
1	Picture 1		1	Scattered lakes	5	1	5	0	0
2	Land/water interface		1	Scattered lakes	5	4	13	1	1
3	Ridges		1	Islands	4	2	7	2	2
4	Small ups and downs		1	Islands	4	4	12	3	3
5	Cold		1	Location	4	4	12	4	4
6	Picture 2		1	Islands	4	1	4	5	5
7	Rocky		0				0	6	6
8	Picture 3		1	Islands	4	1	4	8	7
9	Picture 4		0				0	9	8
10	Frozen		1	Location	4	4	12	10	9
11	Feeling of town		1	Town	4	5	13	12	10
12	Cliff on water		0				0	15	11
13								16	12
14								20	13
15								25	14

Score	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
# of Concepts	3	3	1		4	1		1					3	2	

Weighted Average	2.42

Table A-5 (continued)

Begin Time: 12:46 Target: Inverness Viewer: #002

End Time: Method of Targeting: Coordinates Date: 14 December 1981

Length of Session: Session: 4 Class: B

TRANSCRIPT EVALUATION

Concept Number	Transcript Concept	D	P	Element of Target	Relevance (R)	Quality (Q)	Score	PxRxQ	Score
1	Down jagged		0				0	0	0
2	Picture 1		1	Sloping bank	2	1	2	1	1
3	Flat		1	Area	4	3	10	2	2
4	Water		1	River	4	4	12	3	3
5	Green		1	Grass	1	3	3	4	4
6	Picture 2		1	River banks	2	1	2	5	5
7	Down/up		0				0	6	6
8	Deep valley		0				0	8	7
9	Picture 3	2						9	8
10	Down		1	Banks	2	1	2	10	9
11	Land/water interfaces		1	River	4	4	12	12	10
12	Descending		1	Banks	2	1	2	15	11
13	Trees		1	Trees	2	5	9	16	12
14	Winding river		1	River	4	5	13	20	13
15	Jungle		1	Trees	2	1	2	25	14

Score	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
# of Concepts	3	5	2	2	2	2				1	1		2	1	

Weighted Average	1.21

Table A-5 (continued)

Begin Time: 12:46 Target: Hangö Viewer: #002

End Time: Method of Targeting: Coordinates Date: 14 December 1981

Length of Session: Session: 4 Class: B

TRANSCRIPT EVALUATION

Concept Number	Transcript Concept	D	P	Element of Target	Relevance (R)	Quality (Q)	Score	PxRxQ	Score
1	Down jagged		1	Sloping rocks	3	2	6	0	0
2	Picture 1		1	Sloping rocks	3	2	6	1	1
3	Flat		1	Bay	3	1	3	2	2
4	Water		1	Bay	3	4	10	3	3
5	Green		0				0	4	4
6	Picture 2		1	Sloping rocks	3	1	3	5	5
7	Down/up		0				0	6	6
8	Deep valley		0				0	8	7
9	Picture 3	2						9	8
10	Down		1	Sloping rocks	3	1	3	10	9
11	Land/water interfaces		1	Peninsula	5	4	13	12	10
12	Descending		1	Sloping rocks	3	1	3	15	11
13	Trees		1	Trees	2	4	7	16	12
14	Winding river		1	Bay	3	1	3	20	13
15	Jungle		1	Trees	2	3	6	25	14

Score	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
# of Concepts	3	5	2	1	3		3	1			1			1	

Weighted Average	1.38

Table A-5 (continued)

Begin Time: 12:46 Target: Fernando de Noronha Viewer: #002

End Time: Method of Targeting: Coordinates Date: 14 December 1981

Length of Session: Session: 4 Class: B

TRANSCRIPT EVALUATION

Concept Number	Transcript Concept	D	P	Element of Target	Relevance (R)	Quality (Q)	Score	PxRxQ	Score
1	Down jagged		1	Hills	4	3	10	0	0
2	Picture 1		1	Hills	4	4	12	1	1
3	Flat		0				0	2	2
4	Water		1	Ocean	4	4	12	3	3
5	Green		1	Vegetation	2	3	6	4	4
6	Picture 2		1	Hills	4	1	4	5	5
7	Down/up		1	Hills	4	1	4	6	6
8	Deep valley		0				0	8	7
9	Picture 3	2						9	8
10	Down		1	Sloping hills	4	1	4	10	9
11	Land/water interfaces		1	Island	5	4	13	12	10
12	Descending		1	Sloping hills	4	1	4	15	11
13	Trees		1	Vegetation	2	5	9	16	12
14	Winding river		1	Ocean	4	2	7	20	13
15	Jungle		1	Vegetation	2	5	9	25	14

Score	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
# of Concepts	2	4	1	2	3	2	1	1		2	1		2	1	

Weighted Average	2.22

Table A-5 (continued)

Begin Time: 12:46 Target: Punkaharju Viewer: #002

End Time: Method of Targeting: Coordinates Date: 14 December 1981

Length of Session: Session: 4 Class: B

TRANSCRIPT EVALUATION

Concept Number	Transcript Concept	D	P	Element of Target	Relevance (R)	Quality (Q)	Score	PxRxQ	Score
1	Down jagged		0				0	0	0
2	Picture 1		1	Islands	4	3	10	1	1
3	Flat		1	Area	4	3	10	2	2
4	Water		1	Lakes	5	4	13	3	3
5	Green		0				0	4	4
6	Picture 2		1	Lake bottoms	5	1	5	5	5
7	Down/up		1	Lake bottoms	5	1	5	6	6
8	Deep valley		1	Lake bottoms	5	1	5	8	7
9	Picture 3	2						9	8
10	Down		1	Lake bottoms	5	1	5	10	9
11	Land/water interfaces		1	Lakes	5	4	13	12	10
12	Descending		1	Islands	4	1	4	15	11
13	Trees		1	Trees	2	4	7	16	12
14	Winding river		1	Connected lakes	5	2	9	20	13
15	Jungle		1	Trees	2	1	2	25	14

Score	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
# of Concepts	2	6	1	2	3	4		1		1	2		2		

Weighted Average	2.21

Table A-5 (concluded)

(U) Two types of overall assessment were chosen to emphasize the versatility of the evaluation procedure, (1) a simple rank ordering based on weighted average scores, and (2) a concept-by-concept, non-parametric, statistical technique. Table A-6 shows the results of the first method, the rank ordering. For convenience, the correct matches are underlined.

Table A-6

(U) A RANK ORDERING OF WEIGHTED AVERAGES (U)

Session/Target	Inverness	Hangö	Fernando de Noronha	Punkaharju
2	4.13*	2.72	0.22	2.11
3	1.12	2.65	2.49	2.42
4	1.21	1.38	2.22	2.21
1	1.53	2.52	2.36	0.90

*Scores computed with non-uniform target relevance factors.

(U) From Table A-6, we see that there were 3 first-place matches and 1 fourth-place match. The probability of obtaining 3 of 4 possible first-place matches from chance fluctuations alone are less than 0.051. The point spread between the best match (Inverness) and the worst match (Punkaharju) are in qualitative agreement with a subjective "first look" at the quality of the transcripts as well.

(U) The second analysis determines the significance of the difference between the correct concept/target matches and a control set of matches. All concept/target matches that are not the correct matches act as an internal control set. To avoid any invalid assumptions as to the correct parent distribution, a non-parametric statistical test, the Mann-Whitney U-Test, was chosen for the analysis.[4]

(U) It is beyond the scope of this report to review the details of the Mann-Witney U-Test; thus, only the results are quoted here. The probability that the set of correct concept/target matches is statistically indistinguishable from the control concept/target matches is less than 0.071.

(U) There are a number of additional statistical procedures that could be used to analyze the results of this evaluation technique. The two cited above, however, represent a spread in complexity that demonstrates the internal consistency of the basic evaluation procedure. With only four similar RV sessions, the evaluation technique nearly reached the 0.05 level of statistical significance with each of the two statistical procedures, a result indicating a successful outcome with regard to the overall assessment procedure.

Appendix B

(U) SUMMARY OF EVALUATION TECHNIQUE (U)

Step	Action
1	Task coordinator defines the evaluation goal. He/she identifies target elements and assigns target element relevance factors as appropriate.
2	Analyst conceptualizes responses and prepares an RV assessment sheet for each response.
3	Repeated concepts are noted in the "D" column.
4	Copies of the sheets from Item 2 are made; one for each possible target used in the analysis.
	FOR EACH POSSIBLE RESPONSE/TARGET COMBINATION:
5	Identify a target element for each concept not marked in the "D" column; mark a 1 in the "p" column and write the target element and its relevance factor from Step 1 in the appropriate columns. (Write 0 and blanks if no element can be found.)
6	Using Table 3, assign a quality rating for all present (p = 1) concept/element combinations.
7	Compute the score as follows: a. Calculate relevance (R) X quality (Q) b. Convert R X Q to an integer between 0 and 14 using the conversion table provided.
8	Enter the number of concepts that obtained each possible score in the space provided.
9	Calculate the weighted average using: $A_k = 0.357 \left[\Sigma f_j \sqrt{f_j} S_j / \Sigma f_j \sqrt{f_j} \right]$ where: S_j is the score and f_j is the number of concepts that obtained score j $j = 0, 1, 2, \ldots, 14$
10	For each response, rank order the weighted averages.

REFERENCES (U)

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4. S. Siegel, Nonparametric Statistics, pp. 116-120 (McGraww-Hill, 1956).