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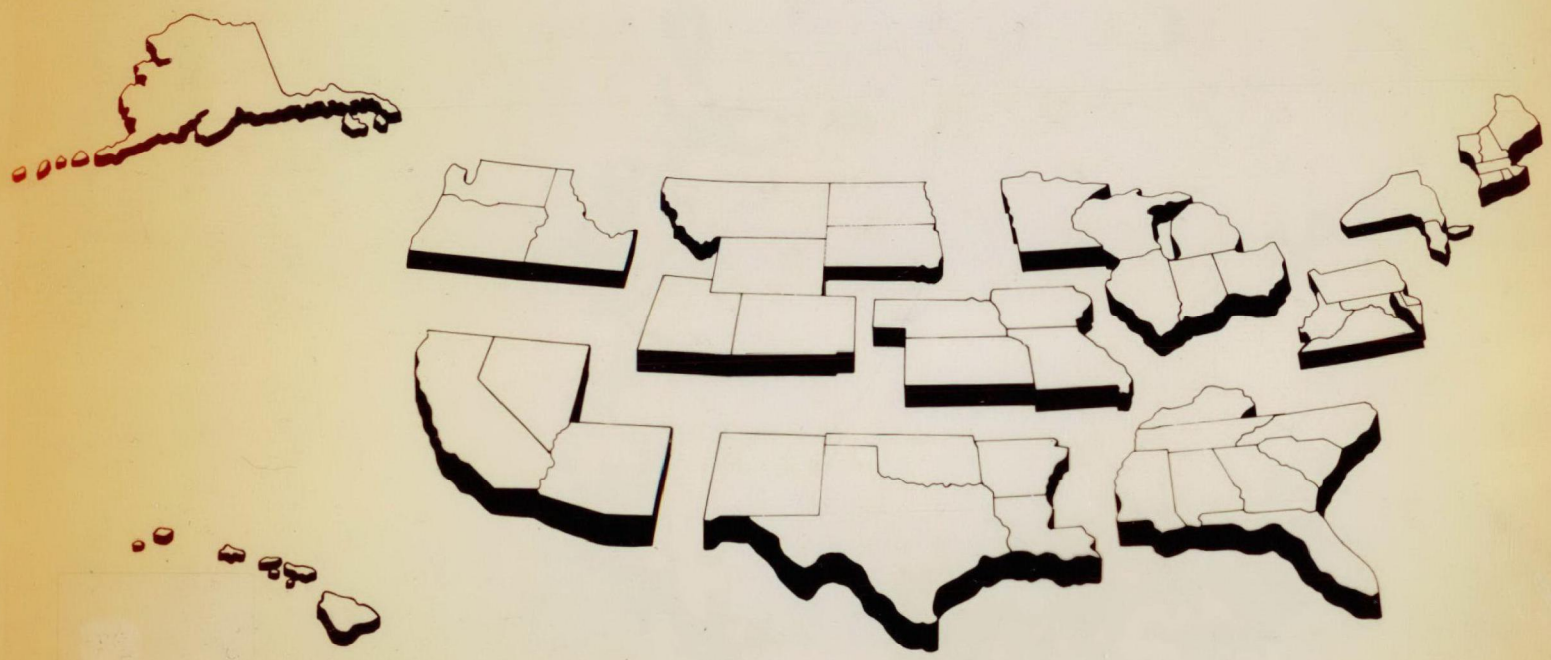
DATABASE DICTIONARY

DENVER BROWN CLOUD AIRSHED STUDY



303

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DATABASE DICTIONARY

DENVER BROWN CLOUD AIRSHED STUDY

A GEOGRAPHIC INFORMATION SYSTEMS DEMONSTRATION PROJECT
REGION 8, U.S. ENVIRONMENTAL PROTECTION AGENCY

by

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Contract No. 68-03-3245

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ABSTRACT

The Denver Brown Cloud project attempted to model atmospheric particulate distribution utilizing the technologies of Light Direction and Ranging (LIDAR) and geographic information systems (GIS). Project objectives included the development of GIS methods to analyze LIDAR data to study the structure, sources, and impacts of haze associated with wintertime inversion (brown cloud) in Denver, Colorado. Contour, polygonal and point planimetric data structures for specific dates, times and elevations were developed. An early morning and mid-afternoon event were modeled for January 13, and 20, 1988 respectively. Preliminary statistical tests indicated a non-parametric correlation between LIDAR and carbon monoxide data for the January 20, 1988 model. Incomplete ground monitoring data and lack of real time air quality measurements hampered the statistical approach necessary for calibration of population risk assessment models. In addition to the development of methodology for the analysis of LIDAR data, this study contributed to the Agency's understanding of the Denver airshed and could be used in planning future LIDAR missions.

PROJECT SUMMARY

I. INTRODUCTION

The Denver airshed during winter is often characterized by high densities of particulate matter suspended in the air. The winter climatology of the Denver basin promotes the trapping of air pollution in shallow inversion layers when downslope flow off the Rocky Mountains warms as it subsides and overrides cooler local areas. Local, and Federal, authorities have been concerned about this problem for the last ten years.

The Denver Brown Cloud (DBC) project attempted to characterize atmospheric particulate distribution of the Denver airshed utilizing the technologies of Light Direction and Ranging (LIDAR) and geographic information systems (GIS). LIDAR, an active airborne laser-based system, has been used over the last decade to observe and to study a variety of atmospheric boundary layer structures. GIS technology integrates, displays and analyzes geographic data, and it has been adopted by EPA as a standard tool for environmental analysis by regional and program offices.

EPA Region 8 sponsored a LIDAR mission to acquire data in January 1988 during a winter inversion period. The LIDAR instrument was on-board a Las Vegas-based aircraft and was operated by personnel from the EPA Environmental Monitoring Systems, Las Vegas, NV (EMSL-LV). The GIS system employed was ARC/INFO. The data collection and analysis was performed by the Remote and Air Monitoring Branch, Lockheed Engineering and Science Co. (LESC), under EPA contract number 68-03-3245, and the Environmental Research Center of the University of Nevada at Las Vegas.

EMSL-LV sought to take advantage of the superior spatial data management tools within GIS to devise innovative methods for analyzing LIDAR data. GIS methods research involved the incorporation of LIDAR, and other air quality data, for use in new techniques of analysis toward air quality evaluation. The principal project goal was to develop methodology to use GIS to analyze LIDAR data in order to better characterize haze associated with wintertime inversion (brown cloud) in Denver Colorado.

II. LIDAR TECHNICAL REVIEW

LIDAR basically operates on the same principle as radar technology. A beam of light is transmitted from the airborne laser and is intercepted by suspended particulates and the ground. Part of the intercepted light is reflected (or backscattered) into the receiver (normally a telescope). LIDAR provides information on the character and distribution of the aerosol.

The main component of the EMSL-LV LIDAR is the frequency doubled Neodymium Yag laser. The laser light is transmitted at wavelengths 1.024 um (Infrared) and 0.532 um (Green). These wavelengths enable detection of particulate backscattering as well as some due to molecular

backscattering. The light from the aerosols is collected through a 36-cm Newtonian telescope receiver. The signal processing is accomplished done by a subsystem which corrected the background and instantaneous laser peak-power values, and converted the signals to digital format. The entire LIDAR system is flown in a downward-looking configuration in an aircraft. The airborne-based nature of LIDAR enables the sampling of large volumes of air in a short time span.

The EPA airborne LIDAR has been used successfully for several years to track and monitor large point-source plumes, urban plumes, polluted air masses and aerosol transport mechanisms (McElroy, 1987; Wakimoto and McElroy, 1986). The instrument's design and aircraft platform make it particularly useful for studies covering regional-scale problems and complex terrain/urban areas.

III. GIS MOTIVATION AND METHODS

Prior to GIS applications, the principal method of LIDAR data analysis involved vertical profiles derived from a two dimensional height verses ground distance graphs. This transect analysis used data which was essentially unaltered other than for data normalization. Each transect plot would present plume and aerosol concentrations along the aircraft flight lines. The limitation of this form of analysis made the study of the whole airshed difficult. GIS offered the tools to integrate, analyze, and display LIDAR's large datasets in a more intuitive planimetric model.

The DBC LIDAR mission was undertaken during the period of January 6-26, 1988. Each mission, during this period, collected data for morning or afternoon events and was flown primarily along transects in a east-west direction. There was a vast quantity of data generated by these missions. Each transect, taking about 6-10 minutes to fly, approximated distances of nine miles, with a LIDAR shot executed and measured about every 150 meters. LIDAR data was generated from reflectance values, or feedback measured by the instrument. This feedback was measured 512 times per shot, or every 20 vertical feet. Total data generated for a afternoon or morning event exceeded 3,300,000 observations.

EMSL-LV adopted an approach based on modeling at a specific elevation above ground level. Elevation specific models were derived from absolute LIDAR shots along transects and interpolated LIDAR data between transects. Data was assumed to behave in a uniform manner. Given the potential dynamics at work with atmospheric phenomenon, this assumption of uniformity may limit the representativeness of the model. However, because the DBC study concentrated on the wintertime inversion, which is characterized by a more stationary air mass at lower elevations, an argument can be made in favor of this assumption.

The LIDAR to ARC integration required a program which read and normalized the infrared LIDAR data return. In this way, data for a particular transect and elevation above ground level (AGL) was obtained, significantly reducing the data management overhead.

Mission LIDAR data files were converted to locational and attribute ARC/INFO point generate files. The completed LIDAR to ARC link was comprised of multiple transects, appended together, based on LIDAR data at a common elevation AGL. The point topology format naturally represented LIDAR returns making it an ideal platform for integrating LIDAR with GIS.

Data Selection Criteria

The January 13 and January 20, 1988 events were selected for modeling based, in part, on requests made by the EPA Region 8 office. Other data selection criteria attempted to balance spatial extent and temporal variability. The January 20, 1988 mission produced 31 transects ranging in time from 0753 to 1759 central time. Seventeen transects, with times from 0744 through 1406 central time, were generated for the January 13, 1988 mission. Transects were selected or excluded to maximize spatial bounds while minimizing temporal variability. Spatial extent was critical to avoid over or under representation of LIDAR data. Time was equally important, considering the dynamic nature of atmospheric phenomena, and was limited to the extent possible given the available data set.

Final transect model selection defined time extents of 1145 - 1430, for the January 20, 1988 model and 0804 - 0944 central time for the January 13, 1988 model. Transect selections were converted to ARC/INFO point topology and grouped together. These intermediate GIS coverages were in excess of 6,500 data points and served as the basis for surface model development.

Interpolation Methods

LIDAR surface models were created using actual and derived values from the intermediate POINT GIS coverage. TIN, (Triangulated Irregular Network), was the surface modeling software used because it contained a variety of interpolation processes which allowed full compatibility with the rest of the ARC/INFO system. TIN supported both non-regular and regularly-spaced surface data. The data structure was comprised of non-overlapping irregular triangles derived from spatially-significant points. Each triangle contained X,Y,Z coordinates and information concerning the neighboring triangles. This structure was extremely efficient for data storage and surface modeling. Linear and Bivariate Quintic (BQ) were two interpolation methods available using TIN. The BQ interpolation method was used to generate the LIDAR surfaces. BQ, its name derived in part from its assumption of a 5th order polynomial, was an effective smoothing algorithm which allowed for the least number of data points required to model the irregular surface.

The large volume of data points along each transect necessitated a sampling criteria to avoid exaggerated interpolation along aircraft flight lines. Exaggeration was caused by spatial limitations related to distance between and along flight transects. Proximal tolerances was adjusted to avoid any apparent distortion of the surface.

IV. GIS ANALYSIS AND QUALITY ASSURANCE

Quality assurance of the LIDAR model relied upon correlation to air quality data derived from ground-based stations and known pollution sources. Correlation was evaluated based on proximity analysis between backscatter values of each LIDAR model and pollution measurements. Strength of relationships was a function of distance and rankings of pollution sources. This type of analysis was used to evaluate the utility of the model to relate plumes and pollution sources. Correlation was restricted to the 30 meter AGL model for analysis. The 30 meter AGL mark was the lowest elevation level before distortion from ground reflectance became evident.

The lack of point source pollution data limited the LIDAR model's quality assurance and calibration tasks to correlation to data obtained from the Atmospheric Information Retrieval System (AIRS) air monitoring network. This network contained ten AIRS stations located in Denver's most urbanized areas. High correlation to specific types of pollutants may allow calibration, and, thus, a confident assessment modeling of the Denver Brown Cloud. However, not enough data calibration and analysis has been performed at this time to associate LIDAR measurements to particulate type and concentration.

Usable air quality data for model correlation, monitored by the Denver AIRS network, were limited to carbon monoxide (CO) because of incomplete collection records. Because CO is considered to be a proportionally significant compound among those which constitute the Denver haze, a direct relationship between CO and particulates was assumed.

Relating time and location between the model and AIRS data became problematic. The AIRS network locations, data temporal resolution and inconsistent number of observations hampered the usefulness of the network for testing purposes. The AIRS network locations were limited and could be used to test only a small portion of each model's extent. The lack of adequate spatial representation prevented meaningful correlation tests for the January 13, 1988 model. The temporal resolution of air quality data was also less than ideal for comparison to the higher resolution LIDAR data: air quality data were averaged at hourly increments, while LIDAR data measurements were timed to the nearest second.

Quality assurance to the AIRS network for the event, was applied in a two phased approach. First, if raw (non-interpolated) LIDAR data supported a viable relationship to air quality, then interpolated GIS LIDAR model evaluation became realistic. This approach permitted a pragmatic assessment of the interpolation process. Statistical testing was compiled using the Statistical Analysis System (SAS). Data transfer between both SAS and ARC/INFO proved to be simple because of the similarities and flexibilities of INFO, and SAS. Data extracted from the ARC/INFO data models included: distances from each LIDAR data point to each monitoring stations, LIDAR values, and time. The AIRS data included station

location, time, and CO values. INFO and Fortran programs generated distance matrices, and related all data into a common file format. Subsequent tasks included parsing the data based on distance from any station and creating a system file for transfer to SAS.

January 13 LIDAR Models

The January 13, 1988 model was developed from data collected between 0804 and 0944 central time. The limited temporal range of the selected LIDAR data should improve the validity of the model. For these models, high reflectance areas were pronounced over downtown and residential locations. These high reflectance areas may coincide with commuter impacts which appear to relate well with the model's time period. Lower overall intensity ranges, as compared with the January 20, 1988, afternoon model, also coincided with the less severe inversion characteristics reported for this day.

Correlation analysis for the January 13, 1988 model proved inconclusive as few transect data points were within close proximity to AIRS ground monitoring stations. Over 94% of the LIDAR data were between 1500 and 2500 meters from any one monitoring station. The lack of a sufficient proximal relationship prevented statistical testing of the January 13, 1988 data model.

January 20, 1988 LIDAR Model

The January 20, 1988 LIDAR models were generated from data collected from 1145 to 1430, and were used for the first LIDAR/GIS modeling effort undertaken by EMSL-LV. LIDAR ranges were identified based on the LIDAR backscatter measured. A relationship was assumed based on a correlation between aerosols and particulates, and reflectance values.

The highest intensity areas were north of Denver, a relatively under-populated area. Atmospheric transport, in conjunction with topographical influences, may present a plausible explanation. Mountain ranges east and north of the city compound inversion episodes. During these winter inversion events, the Denver brown cloud tends to migrate north throughout the morning early-afternoon periods. A reversal of these migration tendencies was known to occur during later afternoon-early evening periods, further exacerbating air quality (Watson and Chow, 1988). Ancillary geographic data, such as roads and municipal boundary information, provided locational reference and potential insights into spatial relationships. High LIDAR plumes appear to relate well to north-eastern highway locations and airport locations.

Statistical results were mixed, which are shown in Tables 1-3. The January 20, 1988 models, indicated a strong relationship between the AIRS monitoring stations and both transect (raw) data and the interpolated model data. Correlation coefficients demonstrated that distance from LIDAR data to AIRS monitoring stations appeared to have an inverse influence on the correlation coefficients.

Table I
Correlation Analysis
Spearmans Test - 1/20/88 Flight Transect Data Only
lu = Lidar Backscatter Units

Distance	Corr. Coeff.	N	Mean (lu)	Median (lu)	Min (lu)	Max (lu)
< 2500 meters	.25	264	78.5	74	0	249
< 1500 meters	.49	100	71.6	67	0	249
< 1000 meters	.72	38	70.8	64	8	249

Table II
Correlation Analysis CO/LIDAR
Spearmans Test - 1/20/88 Interpolated Model Data
lu = Lidar Backscatter Units

Distance	Corr. Coeff.	N	Mean (lu)	Median (lu)	Min (lu)	Max (lu)
< 1500 meters	.34	123	69.8	83	13	121
< 1250 meters	.54	84	63.1	80.5	13	117
< 1000 meters	.75	58	71.4	83.5	13	117

Table III
Regression Analysis CO/LIDAR
Interpolated Data 1/20/88 Interpolated Model

Distance	N	R-Square	Adj-R-Square	Coeff. Var.
< 1500 meters	122	.01	.00	80.5
< 1000 meters	58	.56	.55	55.6

Linear regression analysis, for the January 20, 1988 model, illustrated the possible existence of relationships between CO and LIDAR, when the distance was less then 1000 meters. The nature of the non-parametric correlation and weak linear relationship precluded calibration of the January 20, 1988 LIDAR model.

V. CONCLUSIONS

The DBC project provided a framework for the integration of data from LIDAR, or other active remote sensors for advanced air characterization studies using the GIS. These methodologies could also be applied to other active remote sensing instruments as well. An elevation-specific analysis technique was used to study boundary layers in conjunction with other air quality, geographic, and anthropogenic data. Quality assurance provided some insight into the feasibility of using LIDAR for assessment modeling. While GIS provided the tools and data structures for contaminant characterization, the nature of the spatial and temporal

distribution of data precluded accurate calibration of the LIDAR data model to ground-based air quality measurements. However the test results indicated a strong relationship between LIDAR and CO, and were consistent between the raw LIDAR data and the interpolated model for the January 20, 1988 mission. A more favorable distribution of transects, in relationship to ground monitoring instrumentation and each other, and a smaller study size are recommended for any future LIDAR/GIS studies.

VI. REFERENCES

1. J.L. McElroy, "Estimation of Pollutant Transport and Concentration Distributions over Complex Terrain of Southern California Using Airborne Lidar," JAPCA 37:1046-1051 (1987).

2. R.M. Wakimoto, and J.L. McElroy, "Lidar Observation of Elevated Pollution
Layers over Los Angeles," Journal of Climate and Applied Meteorology, Vol. 25, No. 11, November 1986.

3. Watson, and Chow et al, "Metropolitan Denver Brown Cloud Study", Desert Research Institute, Volume 1, October 1988.

DBC DATA DICTIONARY

The Denver Brown Cloud Data Dictionary is a technical description of each GIS dataset compiled to meet the project's objectives. Data descriptions were organized alphabetically within six major categories. These categories included:

Census	: Socioeconmic data by census tract level.
Cultural	: Boundaries, transportation, hydrography etc.
Elevation	: Topography analysis
ESRI	: Special coverages used to make plots for 1989 ESRI conference.
Lidar	: Lidar elevation specific models for 1/13 and 1/20/88.
QA	: AIRS ground monitoring and 1/20/88 data files.

All datasets within this report were in the form of either ARC/INFO coverages or INFO database files. The data descriptions provided in this document quantify many technical features of these datasets, and summarizes other information including dataset type, use and processing steps.

All GIS data coverages, with the exception of the ESRI category, were compiled in the Universal Transverse Mercator (UTM) map projection using Zone 13 and a y-shift of -4,000,000 meters as projection parameters.

DATA DICTIONARY LISTINGS

CENSUS

Census track information was digitzed from 1:24000 7.5 Minute USGS Quarangles. Map data was manually transfered to each Quadrangle from the 1980 Census for Denver Standard Metropolitan Statistical Area Maps. Socioenconmic information was obtained from digital Donnelly Marketing statistical files for the same area. There may be some map errors due to the poor map quality of the Statistical Area Maps.

Census Attribute Information

Name	Definition	Name	Definition
CENSUS	Tract Identification Numeric	TRACT	Tract Identification Integer
STATE	State Numeric Code	COUNTY	County Numeric Code
BG/ED		HH-88	
HH-93		POP-88	1988 Population (Derived)
POP-93	1993 Population (Derived)	POP-80	1980 Population
FLAG	Used for Processing (N/A)	SESI	Socioeconomic Statistical Index
M/0-5/88	Male Age 0-5 1988		
M/14-17/88	Male Age 14-17 1988	M/6-13/88	Male Age 6-13 1988
M/18-24/88	Male Age 18-24 1988	M/25-29/88	Male Age 25-29 1988
M/30-34/88	Male Age 30-34 1988	M/35-44/88	Male Age 35-44 1988
M/35-44/88	Male Age 35-44 1988	M/45-54/88	Male Age 45-54 1988
M/55-64/88	Male Age 55-64 1988	M/65+/88	Male Age 65 and over 1988
M/0-5/93	Male Age 0-5 1993	M/6-13/93	Male Age 6-13 1993
M/14-17/93	Male Age 14-17 1993	M/25-29/93	Male Age 25-29 1993
M/18-24/93	Male Age 18-24 1993	M/35-44/93	Male Age 35-44 1993
M/30-34/93	Male Age 30-34 1993	M/45-54/93	Male Age 45-54 1993
M/35-44/93	Male Age 35-44 1993	M/65+/93	Male Age 65 and over 1993
M/55-64/93	Male Age 55-64 1993	F/0-5/88	Female Age 0-5 1988
F/6-13/88	Female Age 6-13 1988	F/14-17/88	Female Age 14-17 1988
F/18-24/88	Female Age 18-24 1988	F/25-29/88	Female Age 25-29 1988
F/30-34/88	Female Age 30-34 1988	F/35-44/88	Female Age 35-44 1988
F/35-44/88	Female Age 35-44 1988	F/45-54/88	Female Age 45-54 1988
F/55-64/88	Female Age 55-64 1988	F/65+/88	Female Age 65 and over 1988
F/0-5/93	Female Age 0-5 1993	F/6-13/93	Female Age 6-13 1993
F/14-17/93	Female Age 14-17 1993	F/25-29/93	Female Age 25-29 1993
F/18-24/93	Female Age 18-24 1993	F/35-44/93	Female Age 35-44 1993
F/30-34/93	Female Age 30-34 1993	F/45-54/93	Female Age 45-54 1993
F/35-44/93	Female Age 35-44 1993	F/65+/93	Female Age 65 and over 1993
F/55-64/93	Female Age 55-64 1993		

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Summary: Census track digitized from 1:24000 7.5 USGS Quadrangles
Coverage Type: Census
Feature Type: Polygon
Manuscript Producer: U.S. Department of Commerce, Bureau of the Census
Manuscript: Map data transfered from Denver Standard Metropolitan Statistical Area Maps
Manuscript Date: 1980
Manuscript RMS error: < .005
Input Scale: 1:24000
Digitized by: Jonathan Pickus, Lockheed Engineering and Sciences Co.
Date Produced: 11/10/88

CENSUS Continued...

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		Annotations =	0
		Links =	0

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17	CENSUS	7	7	N	2		-
24	TRACT	6	6	I	-		-
30	STATE	2	2	I	-		-
32	COUNTY	3	3	I	-		-
35	BG/ED	7	7	C	-		-
42	HH-88	9	9	I	-		-
51	HH-93	9	9	I	-		-
60	POP-88	9	9	I	-		-
69	POP-93	9	9	I	-		-
78	POP-80	9	9	I	-		-
87	FLAG	1	1	I	-		-
88	SESI	2	2	I	-		-
90	M/0-5/88	9	9	I	-		-
99	M/6-13/88	9	9	I	-		-
108	M/14-17/88	9	9	I	-		-
117	M/18-24/88	9	9	I	-		-
126	M/25-29/88	9	9	I	-		-
135	M/30-34/88	9	9	I	-		-
144	M/35-44/88	9	9	I	-		-
153	M/45-54/88	9	9	I	-		-
162	M/55-64/88	9	9	I	-		-

CENSUS Continued...

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189	M/6-13/93	9	9	I	-	-
198	M/14-17/93	9	9	I	-	-
207	M/18-24/93	9	9	I	-	-
216	M/25-29/93	9	9	I	-	-
225	M/30-34/93	9	9	I	-	-
234	M/35-44/93	9	9	I	-	-
243	M/45-54/93	9	9	I	-	-
252	M/55-64/93	9	9	I	-	-
261	M/65+/93	9	9	I	-	-
270	F/0-5/88	9	9	I	-	-
279	F/6-13/88	9	9	I	-	-
288	F/14-17/88	9	9	I	-	-
297	F/18-24/88	9	9	I	-	-
306	F/25-29/88	9	9	I	-	-
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342	F/55-64/88	9	9	I	-	-
351	F/65+/88	9	9	I	-	-
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369	F/6-13/93	9	9	I	-	-
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441	F/65+/93	9	9	I	-	-
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11/10/88	13:39	7	140	2410	CLEAN CENSUS-UTM2 CENSUS-UTM4 100 1
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CULTURAL

Data was aquired from Petroleum Institute which represented transportation, hydrography and boundary data.

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Summary: Boundary data representing state and national parks, military reservations, grants and ranchos.
Coverage Type: Cultural
Feature Type: Polygon
Manuscript Producer: Petroleum Institute
Manuscript: Unknown
Manuscript Date: Unknown
Manuscript RMS error: Unknown
Average RMS error: Unknown
Input Scale: 1:24,000
Date Produced: 8/2/88

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TOLERANCES		STATUS
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Dangle =	0.000 N	since the last BUILD or CLEAN.

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ITEMS 03/22/90

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DF	BOUNDARY.AAT	ARC031DAT	799	42	XX
DF	BOUNDARY.PAT	ARC032DAT	59	30	XX
DF	BOUNDARY.BND	ARC033DAT	1	16	XX
DF	BOUNDARY.TIC	ARC038DAT	16	12	XX

BOUNDARY Continued...

BOUNDARY.PAT
59 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	BOUNDARY#	4	5	B	0		-
13	BOUNDARY-ID	4	5	B	0		-
17	FEATURE	4	4	I	-		-
21	SEARCH	10	10	C	-		-
31	SYMBOL	3	3	I	-		-
34	TYPE	30	30	C	-		-

BOUNDARY.AAT
799 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	FNODE#	4	5	B	0		-
5	TNODE#	4	5	B	0		-
9	LPOLY#	4	5	B	0		-
13	RPOLY#	4	5	B	0		-
17	LENGTH	4	12	F	3		-
21	BOUNDARY#	4	5	B	0		-
25	BOUNDARY-ID	4	5	B	0		-
29	FEATURE	4	4	I	-		-
33	SEARCH	10	10	C	-		-

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Date	Time	Elap min	CPU sec	I/O opr	Command
8/ 2/88	11:39	1	45	1062	import cover cult-1.e00 bound-1
8/ 2/88	14:59	0	3	217	RENAME BOUND-1 BOUNDARY
8/ 3/88	8:58	2	74	2538	build boundary
3/ 6/90	11:36	0	2	118	EXTERNALALL [.PI]

Name of Coverage: CITY
Location: DUB0:[DENVER.PI]
Summary: City boundary coveraged obtained from Petrolium Institute. Item SEARCH contains the first 10 characters of each city. Full city names can be displayed using the Annotation commands in ARC/PLOT.
Coverage Type: Cultural
Feature Type: Polygon
Manuscript Producer: Petroleum Institute
Manuscript: Unknown
Manuscript Date: Unknown
Manuscript RMS error: Unknown
Input Scale: 1:24,000
Date Produced: 8/3/88

DESCRIPTION OF SINGLE PRECISION COVERAGE CITY

ARCS		POLYGONS	
Arcs =	1112	Polygons =	76
Segments =	3715	Polygon Topology is present.	
42 bytes of Arc Attribute Data		30 bytes of Polygon Attribute Data	

POINTS		SECONDARY FEATURES	
Label Points =	46	Tics =	16
		Annotations =	40
		Links =	0

TOLERANCES		STATUS
Fuzzy =	8.988 N	The coverage has not been Edited
Dangle =	0.000 N	since the last BUILD or CLEAN.

COVERAGE BOUNDARY

Xmin =	457153.906	Ymin =	379405.625
Xmax =	541492.563	Ymax =	469289.094

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DF	CITY-RES.TIC	ARC005DAT	16	12	XX
DF	CITY-RES.BND	ARC052DAT	1	16	XX
DF	CITY-RES.PAT	ARC053DAT	76	30	XX
DF	CITY-RES.AAT	ARC054DAT	1112	42	XX

CITY.PAT
76 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	CITY#	4	5	B	0		-
13	CITY-ID	4	5	B	0		-
17	FEATURE	4	4	I	-		-
21	SEARCH	10	10	C	-		-

CITY Continued...

CITY.AAT
1112 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	FNODE#	4	5	B	0		-
5	TNODE#	4	5	B	0		-
9	LPOLY#	4	5	B	0		-
13	RPOLY#	4	5	B	0		-
17	LENGTH	4	12	F	3		-
21	CITY-RES#	4	5	B	0		-
25	CITY-RES-ID	4	5	B	0		-
29	FEATURE	4	4	I	-		-
33	SEARCH	10	10	C	-		-

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Date	Time	Elap min	CPU sec	I/O opr	Command
8/ 2/88	12: 7	2	61	1075	IMPORT COVER CULT-2.E00 CITY
8/ 3/88	13:57	3	97	2672	BUILD CITY
8/ 3/88	14:35	3	96	2248	BUILD CITY
8/ 3/88	14:36	0	2	128	IDEDIT CITY
8/ 3/88	14:51	3	57	2107	RESELECT CITY CITY-RES
3/ 6/90	11:36	0	2	111	EXTERNALALL [.PI]
3/ 6/90	11:36	0	2	101	EXTERNALALL [.PI]

Name of Coverage: COUNTY
Location: DUB0:[DENVER.PI]
Summary: This coverage containes numerious boundary data. County boundaries are also clearly marked. However, this coverage needs further processing to clearly delineate county boundaries.
Coverage Type: Cultural
Feature Type: Polygon
Manuscript Producer: Petroleum Institute
Manuscript: Unknown
Manuscript Date: Unknown
Manuscript RMS error: Unknown
Input Scale: 1:24,000
Date Produced: 8/2/88

DESCRIPTION OF SINGLE PRECISION COVERAGE COUNTY

ARCS		POLYGONS	
Arcs =	812	Polygons =	64
Segments =	2062	Polygon Topology is present.	
42 bytes of Arc Attribute Data		30 bytes of Polygon Attribute Data	

POINTS		SECONDARY FEATURES	
Label Points =	63	Tics =	16
		Annotations =	113
		Links =	0

TOLERANCES		STATUS
Fuzzy =	11.099 V	The coverage has not been Edited
Dangle =	0.000 V	since the last BUILD or CLEAN.

COVERAGE BOUNDARY

Xmin =	456932.375	Ymin =	358302.500
Xmax =	543067.625	Ymax =	469289.094

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TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	COUNTY.TIC	ARC008DAT	16	12	XX
DF	COUNTY.PAT	ARC009DAT	64	30	XX
DF	COUNTY.BND	ARC010DAT	1	16	XX
DF	COUNTY.AAT	ARC011DAT	812	42	XX

COUNTY.PAT
64 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	COUNTY#	4	5	B	0		-
13	COUNTY-ID	4	5	B	0		-
17	FEATURE	4	4	I	-		-
21	SEARCH	10	10	C	-		-

COUNTY Continued...

COUNTY.AAT
812 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	FNODE#	4	5	B	0		-
5	TNODE#	4	5	B	0		-
9	LPOLY#	4	5	B	0		-
13	RPOLY#	4	5	B	0		-
17	LENGTH	4	12	F	3		-
21	COUNTY#	4	5	B	0		-
25	COUNTY-ID	4	5	B	0		-
29	FEATURE	4	4	I	-		-
33	SEARCH	10	10	C	-		-

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Date	Time	Elap min	CPU sec	I/O opr	Command
8/ 2/88	14: 7	2	47	693	IMPORT COVER COUNTY.E00 COUNTY
3/ 6/90	11:36	0	2	95	EXTERNALALL [.PI]

Description of Coverage: ROADS
Location: DUB0:[DENVER.PI]
Summary: Transportation coverage. Feature codes represent road categories. SEARCH is an attribute which contains the first 10 characters of each road name. ROADS.LKUP is an INFO lookup tables which can be related by FEATURE for plotting different road types.
Coverage Type: Cultural
Feature Type: Line
Manuscript Producer: Petroleum Institute
Manuscript: Unknown
Manuscript Date: Unknown
Manuscript RMS error: Unknown
Input Scale: 1:24,000
Date Produced: 8/2/88

DESCRIPTION OF SINGLE PRECISION COVERAGE ROADS

```
         ARCS                                POLYGONS

Arcs           =       2265            Polygons     =          0
Segments       =      12044            There is NO Polygon Topology.
42   bytes of Arc Attribute Data        0    bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =          0             Tics         =         16
                                       Annotations  =          0
                                       Links        =          0
         TOLERANCES                          STATUS

Fuzzy    =            11.099 V         The coverage has not been Edited
Dangle   =             0.000 N         since the last BUILD or CLEAN.

                     COVERAGE BOUNDARY

Xmin =                456953.844       Ymin =                358302.500
Xmax =                542950.938       Ymax =                469294.563
```

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TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	ROADS.AAT	ARC012DAT	2265	42	XX
DF	ROADS.BND	ARC013DAT	1	16	XX
DF	ROADS.TIC	ARC014DAT	16	12	XX
DF	ROADS.LKUP	ARC029DAT	5	7	

ROADS.AAT
2265 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	FNODE#	4	5	B	0		-
5	TNODE#	4	5	B	0		-
9	LPOLY#	4	5	B	0		-
13	RPOLY#	4	5	B	0		-
17	LENGTH	4	12	F	3		-
21	ROADS#	4	5	B	0		-
25	ROADS-ID	4	5	B	0		-
29	FEATURE	4	4	I	-		-
33	SEARCH	10	10	C	-		-

ROADS Continued...

ROADS.LKUP
5 Records Selected

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	FEATURE	4	4	I	-		-
5	SYMBOL	3	3	I	-		-

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Date	Time	Elap min	CPU sec	I/O opr	Command
8/ 2/88	12:12	2	102	932	IMPORT COVER CULT-4.E00 ROADS
3/ 6/90	11:37	0	1	75	EXTERNALALL [.PI]

Name of Coverage: SECTION
Location: DUB0:[DENVER.PI]
Summary: Public Land Survey section data. Attributes are the section number.
Coverage Type: Cultural
Feature Type: Polygon
Manuscript Producer: Petroleum Institute
Manuscript: Unknown
Manuscript Date: Unknown
Manuscript RMS error: Unknown
Input Scale: 1:24000
Date Produced: 8/2/88

DESCRIPTION OF SINGLE PRECISION COVERAGE SECTION

ARCS		POLYGONS	
Arcs =	8345	Polygons =	3774
Segments =	8742	Polygon Topology is present.	
28 bytes of Arc Attribute Data		19 bytes of Polygon Attribute Data	

POINTS		SECONDARY FEATURES	
Label Points =	3785	Tics =	16
		Annotations =	0
		Links =	0

TOLERANCES		STATUS
Fuzzy =	11.099 V	The coverage has not been Edited
Dangle =	0.000 V	since the last BUILD or CLEAN.

COVERAGE BOUNDARY

Xmin =	456932.375	Ymin =	358302.500
Xmax =	543067.625	Ymax =	469289.094

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TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	SECTION.PAT	ARC026DAT	0	19	
DF	SECTION.AAT	ARC043DAT	8345	28	XX
DF	SECTION.BND	ARC044DAT	1	16	XX
DF	SECTION.TIC	ARC051DAT	0	12	XX

SECTION.PAT
3774 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	SECTION#	4	5	B	0		-
13	SECTION-ID	4	5	B	0		-
17	SECTION	3	3	I	-		-

SECTION Continued...

SECTION.AAT
8345 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	FNODE#	4	5	B	0		-
5	TNODE#	4	5	B	0		-
9	LPOLY#	4	5	B	0		-
13	RPOLY#	4	5	B	0		-
17	LENGTH	4	12	F	3		-
21	SECTION#	4	5	B	0		-
25	SECTION-ID	4	5	B	0		-

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Date	Time	Elap min	CPU sec	I/O opr	Command
8/ 2/88	12: 3	9	414	1655	IMPORT COVER SEC.E00 SECTION
8/ 2/88	15: 1	1	9	641	COPY [DENVER.TRS]SECTION
3/23/90	10: 5	0	2	100	EXTERNAL SECTION
3/23/90	10: 7	1	14	1067	COPY [DENVER.RESTORE]SECTION SECTION
3/23/90	10: 8	0	2	83	EXTERNAL SECTION
3/23/90	13:49	23	531	26821	export cover SECTION dub1:[pearl.denver]SECTION.e00

Name of Coverage: TOWNSHIP
Location: DUB0:[DENVER.PI]
Summary: Township coverage from T2S R72W to T5N R64W.
Coverage Type: Cultural
Feature Type: Polygon
Manuscript Producer: Petroleum Institute
Manuscript: Unknown
Manuscript Date: Unknown
Manuscript RMS error: Unknown
Input Scale: 1:24,000
Date Produced: 8/2/88

DESCRIPTION OF SINGLE PRECISION COVERAGE TOWNSHIP

ARCS		POLYGONS	
Arcs =	353	Polygons =	127
Segments =	1592	Polygon Topology is present.	
28 bytes of Arc Attribute Data		31 bytes of Polygon Attribute Data	

POINTS		SECONDARY FEATURES	
Label Points =	120	Tics =	16
		Annotations =	0
		Links =	0

TOLERANCES		STATUS
Fuzzy =	10.000 V	The coverage has not been Edited
Dangle =	10.000 V	since the last BUILD or CLEAN.

COVERAGE BOUNDARY

Xmin =	456932.375	Ymin =	358302.500
Xmax =	543067.625	Ymax =	469289.094

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TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	TOWNSHIP.AAT	ARC021DAT	353	28	XX
DF	TOWNSHIP.PAT	ARC023DAT	127	31	XX
DF	TOWNSHIP.BND	ARC041DAT	1	16	XX
DF	TOWNSHIP.TIC	ARC042DAT	0	12	XX

TOWNSHIP.PAT
127 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	TOWNSHIP#	4	5	B	0		-
13	TOWNSHIP-ID	4	5	B	0		-
17	TNAME	15	15	C	-		-

TOWNSHIP Continued...

TOWNSHIP.AAT
353 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	FNODE#	4	5	B	0		-
5	TNODE#	4	5	B	0		-
9	LPOLY#	4	5	B	0		-
13	RPOLY#	4	5	B	0		-
17	LENGTH	4	12	F	3		-
21	TOWNSHIP#	4	5	B	0		-
25	TOWNSHIP-ID	4	5	B	0		-

LOG 03/23/90

Date	Time	Elap min	CPU sec	I/O opr	Command
8/ 2/88	12: 9	1	27	624	IMPORT COVER TWN.E00 TOWNSHIP
8/ 2/88	13:55	1	8	598	COPY [DENVER.TRS]TOWNSHIP
3/23/90	10: 5	0	2	101	EXTERNAL TOWNSHIP
3/23/90	10: 8	0	10	605	COPY [DENVER.RESTORE]TOWNSHIP TOWNSHIP
3/23/90	10: 8	0	2	95	EXTERNAL TOWNSHIP
3/23/90	13:26	1	36	1995	export cover TOWNSHIP dubl:[pearl.denver]TOWNSHIP.e00

ELEVATION

Digital Elevation Models representing the Denver's topography was developed by EMSL-LV from 1:24000 USGS topographic quadrangles. A point coverage was created consisting of 13259 spot elevations. Elevation sampling was based on the homogenity of the topography. A greater number of elevation samples were collected in areas of higher relief. TIN, ARC/INFO's surface modeling system was used to generate surfaces, contours and views.

Name of Coverage: ELEV-DBC
Location: DISK$USER3:[DENVER.ELEV]
Summary: A collection of points representing elevation. Used as input to TIN for surface generation.
Coverage Type: Elevation
Feature Type: Point
Manuscript Producer: USGS
Manuscript: 7.5 Minute Topographic Maps
Manuscript Date: N/A
Manuscript RMS error: < .005
Input Scale: 1:24,000
Digitized by: Jonathan Pickus, Lockheed Engineering and Science Co.
Date Produced: 8/25/88

DESCRIPTION OF SINGLE PRECISION COVERAGE ELEV-DBC

```
         ARCS                                POLYGONS

Arcs          =          0            Polygons    =          0
Segments      =          0            There is NO Polygon Topology.
0    bytes of Arc Attribute Data       0    bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =      13259             Tics        =         39
22   bytes of Attribute Data/Point     Annotations =          0
                                       Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            6.952 N           The coverage has not been Edited
Dangle  =            0.000 N           since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =               467814.344        Ymin =               385837.594
Xmax =               532138.125        Ymax =               455356.781
```

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TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	ELEV-DBC.PAT	ARC184DAT	13259	22	XX
DF	ELEV-DBC.BND	ARC185DAT	1	16	XX
DF	ELEV-DBC.TIC	ARC186DAT	39	12	XX

ELEV-DBC Continued...

ELEV-DBC.PAT
13259 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	ELEV-DBC#	4	5	B	0		-
13	ELEV-DBC-ID	4	5	B	0		-
17	ELEV	6	6	I	-		-

LOG 03/22/90

Date	Time	Elap min	CPU sec	I/O opr	Command
8/25/88	9:56	0	5	237	CREATE ELEV-DBC-UTM
3/ 6/90	9:50	0	5	137	EXTERNALALL [.ELEV]
3/22/90	13:20	0	5	139	EXTERNALALL
3/22/90	13:26	0	10	257	RENAME ELEV-DBC-UTM ELEV-DBC

Description of Coverage: ELEV-POLY
Location: DISK$USER3:[DENVER.ELEV]
Summary: A coverage represent elevation at 500 feet intervals.
Coverage Type: Elevation
Feature Type: Polygon
Date Produced: 8/29/88

DESCRIPTION OF SINGLE PRECISION COVERAGE ELEV-POLY

```
         ARCS                                POLYGONS

Arcs          =        617            Polygons    =        365
Segments      =      19169            Polygon Topology is present.
0    bytes of Arc Attribute Data      27   bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =        364            Tics        =          4
                                      Annotations =          0
                                      Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            6.952 N          The coverage has not been Edited
Dangle  =            0.000 N          since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =               467814.344       Ymin =               385837.594
Xmax =               532138.125       Ymax =               455356.781
```

ITEMS 03/22/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	ELEV-POLY.PAT	ARC178DAT	365	27	XX
DF	ELEV-POLY.BND	ARC179DAT	1	16	XX
DF	ELEV-POLY.TIC	ARC180DAT	4	12	XX

ELEV-POLY.PAT
365 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	ELEV-POLY#	4	5	B	0		-
13	ELEV-POLY-ID	4	5	B	0		-
17	RANGE-CODE	4	5	B	0		-
21	ELEV	7	7	I	-		-

LOG 03/22/90

```
   Date     Time Elap  CPU   I/O  Command
                min   sec   opr
 -------- ----- ---- ----  ---- ----------------
  8/29/88    9:12      7     128    6667  LATTICEPOLY  ELEV-UTM-LAT  ELEV-POLY-UTM  RANGE
ELEV-RANGE.LKUP
  9/ 6/88 16:39   0    10   878 COPY DUA2:[KANSAS.DENVER.ELEV]ELEV-POLY-UTM
  3/ 6/90  9:50   0     5   137 EXTERNALALL [.ELEV]
  3/22/90 13:20   0     5   139 EXTERNALALL
  3/22/90 13:25   0    10   257 RENAME ELEV-POLY-UTM ELEV-POLY
```

Name of Coverage: ELEV-TIN
Location: DISK$USER3:[DENVER.ELEV]
Summary: A TIN (Triangulated Integrated Network) structure used to model a surface. ELEV-TIN was created from the point coverage ELEV-DBC.
Coverage Type: Elevation
Feature Type: TIN
Date Produced: 8/29/88

TIN DESCRIPTION FOR ELEV-TIN

Tin Topology

Nodes = 13259 Triangles = 26496
Hull nodes = 20

Surface value range

Min Z = 4765.000 Max Z = 9795.000

Tin Boundary

Xmin = 467814.344 Ymin = 385837.594
Xmax = 532138.125 Ymax = 455356.781

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Date	Time	Elap min	CPU sec	I/O opr	Command
8/29/88	8:10	3	128	1402	ARCTIN ELEV-DBC-UTM ELEV-TIN-UTM POINT ELEV
3/ 6/90	9:51	0	5	158	EXTERNALALL [.ELEV]
3/22/90	13:21	0	6	179	EXTERNALALL
3/22/90	13:28	0	4	106	RENAME ELEV-TIN-UTM ELEV-TIN

Name of Coverage: ELEV-TIN-HULL
Location: DISK$USER3:[DENVER.ELEV]
Summary: A coverage representing the boundary extent of TIN ELEV-TIN. This coverage is used to produce plots for overlaying (draping) over surface views.
Coverage Type: Elevation
Feature Type: Polygon
Date Produced: 3/22/90

DESCRIPTION OF SINGLE PRECISION COVERAGE ELEV-TIN-HULL

ARCS		POLYGONS	
Arcs =	20	Polygons =	2
Segments =	20	Polygon Topology is present.	
0 bytes of Arc Attribute Data		16 bytes of Polygon Attribute Data	

POINTS		SECONDARY FEATURES	
Label Points =	0	Tics =	4
		Annotations =	0
		Links =	0

TOLERANCES		STATUS
Fuzzy =	6.952 N	The coverage has not been Edited
Dangle =	0.000 N	since the last BUILD or CLEAN.

COVERAGE BOUNDARY

Xmin =	467814.344	Ymin =	385837.594
Xmax =	532138.125	Ymax =	455356.781

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TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	ELEV-TIN-HULL.BND	ARC183DAT	1	16	XX
DF	ELEV-TIN-HULL.PAT	ARC188DAT	2	16	XX
DF	ELEV-TIN-HULL.TIC	ARC189DAT	4	12	XX

ELEV-TIN-HULL.PAT
2 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	ELEV-TIN-HULL#	4	5	B	0		-
13	ELEV-TIN-HULL-ID	4	5	B	0		-

LOG 03/22/90

Date	Time	Elap min	CPU sec	I/O opr	Command
3/22/90	13:36	1	11	747	TINARC ELEV-TIN ELEV-TIN-HULL HULL

Name of Coverage: ELEV-31545-V3D
Location: DUBO:[DENVER.ELEV]
Summary: A 3D view of Denver's elevation. View from 315 degrees at 45 degree angle. Generated using TIN's View commands. View coverages are used for display purposes only and do not contain topology.
Coverage Type: Elevation
Feature Type: Line
Date Produced: 9/8/88

DESCRIPTION OF SINGLE PRECISION COVERAGE ELEV-TIN-HULL

COVERAGE BOUNDARY

Xmin =	1.031	Ymin =	1.373
Xmax =	8.178	Ymax =	7.617

Name of Coverage: ELEV-UTM-LAT.DAT
Location: DUB0:[DENVER.ELEV]
Summary: A Lattice file is a system binary file used by TIN for creating polygon coverages.
Coverage Type: Elevation
Feature Type: LATTICE
Date Produced: 9/6/88

LATTICE DESCRIPTION FOR ELEV-UTM-LAT.DAT

Lattice size and origin

Points in X/Y = 500 500 Origin (x,y)= 467814.344 385837.594

Lattice distance between points

Distance in X = 128.648 Distance in Y = 139.038

Surface value range

Min Z = 4765.000 Max Z = 9782.598

Lattice boundary

Xmin = 467814.344 Ymin = 385837.594
Xmax = 532009.500 Ymax = 455217.750

ESRI (Final Demonstration Plot and Data Files)

These coverages were developed for the Environmental System Research Institutes conference in 1989. These data files were transformed to provide a perspective view of the "Denver Brown Cloud" elevation specific slices from 50 through 200 meters AGL. All coverages were transformed to a template tic file. These coordinates are in inches.

Description of Coverage: BOUND-T
Location: DISK$USER3:[DENVER.ESRI]
Summary: The linear transformation of the [DENVER.PI]BOUNDARY file.
Coverage Type: ESRI
Feature Type: Polygon
Average RMS error: N/A
Input Scale: 1:24000
Date Produced: 4/4/89

DESCRIPTION OF SINGLE PRECISION COVERAGE BOUND-T

```
         ARCS                                POLYGONS

Arcs          =        364            Polygons     =        28
Segments      =        970            Polygon Topology is present.
0    bytes of Arc Attribute Data      30   bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =         27            Tics         =        20
                                      Annotations  =        58
                                      Links        =         0
         TOLERANCES                          STATUS

Fuzzy   =            0.000 N          The coverage has not been Edited
Dangle  =            0.000 N          since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =                    47.620       Ymin =                    10.851
Xmax =                    60.650       Ymax =                    15.770
```

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TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	BOUND-T.BND	ARC018DAT	1	16	XX
DF	BOUND-T.TIC	ARC019DAT	20	12	XX
DF	BOUND-T.PAT	ARC040DAT	28	30	XX

BOUND-T.PAT
28 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	BOUND-T#	4	5	B	0		-
13	BOUND-T-ID	4	5	B	0		-
17	FEATURE	4	4	I	-		-
21	SEARCH	10	10	C	-		-

BOUND-T Continued...

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Date	Time	Elap min	CPU sec	I/O opr	Command
4/ 4/89	9:56	1	6	702	CREATE BOUND-T TIC_FRAME
4/ 4/89	9:59	1	15	1088	TRANSFORM BOUNDARY BOUND-T

Name of Coverage: CITY-T
Location: DISK$USER3:[DENVER.ESRI]
Summary: The linear transformation of the coverage [DENVER.PI]CITY.
Coverage Type: ESRI
Feature Type: Polygon
Average RMS error: N/A
Input Scale: 1:24,000
Date Produced: 4/4/89

DESCRIPTION OF SINGLE PRECISION COVERAGE CITY-T

ARCS		POLYGONS	
Arcs =	980	Polygons =	63
Segments =	3301	Polygon Topology is present.	
0 bytes of Arc Attribute Data		30 bytes of Polygon Attribute Data	

POINTS		SECONDARY FEATURES	
Label Points =	63	Tics =	16
		Annotations =	27
		Links =	0

TOLERANCES		STATUS
Fuzzy =	0.001 N	The coverage has not been Edited
Dangle =	0.000 N	since the last BUILD or CLEAN.

COVERAGE BOUNDARY

Xmin =	49.716	Ymin =	10.851
Xmax =	59.119	Ymax =	15.675

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TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	CITY-T.PAT	ARC002DAT	63	30	XX
DF	CITY-T.BND	ARC003DAT	1	16	XX
DF	CITY-T.TIC	ARC004DAT	16	12	XX

CITY-T.PAT
63 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	CITY-T#	4	5	B	0		-
13	CITY-T-ID	4	5	B	0		-
17	FEATURE	4	4	I	-		-
21	SEARCH	10	10	C	-		-

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Date	Time	Elap min	CPU sec	I/O opr	Command
3/30/89	13:39	0	4	288	CREATE CITY-TRANS [DENVER.DEV]TIC_FRAME
3/30/89	13:42	1	19	764	TRANSFORM CITY-GPH CITY-TRANS
3/31/89	8: 6	0	7	489	copy [denver.graph-covers]city-trans
4/ 4/89	9:40	0	3	169	RENAME CITY-TRANS CITY-T
3/28/90	9:17	2	50	2559	EXPORT COVER CITY-T DUB1:[PEARL.DENVER]CITY-T.E00

Description of Coverage: E30-RNG-T
Location: DISK$USER3:[DENVER.ESRI]
Summary: The linear transformation of the coverage [DENVER.JAN20.DEV-30]E30-RANGE.
Coverage Type: ESRI
Feature Type: Polygon
Average RMS error: N/A
Input Scale: N/A
Date Produced: 4/5/89

DESCRIPTION OF SINGLE PRECISION COVERAGE E30-RNG-T

```
         ARCS                                POLYGONS

Arcs          =        127            Polygons    =        67
Segments      =       8080            Polygon Topology is present.
0    bytes of Arc Attribute Data      38   bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =         66            Tics        =        20
                                      Annotations =         0
                                      Links       =         0
         TOLERANCES                          STATUS

Fuzzy   =            0.000 N          The coverage has not been Edited
Dangle  =            0.000 N          since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =                    47.664       Ymin =                    13.775
Xmax =                    60.665       Ymax =                    18.774
```

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TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E30-RNG-T.PAT	ARC027DAT	67	38	XX
DF	E30-RNG-T.BND	ARC028DAT	1	16	XX
DF	E30-RNG-T.TIC	ARC030DAT	20	12	XX

E30-RNG-T.PAT
67 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E30-RNG-T#	4	5	B	0		-
13	E30-RNG-T-ID	4	5	B	0		-
17	E30-RANGE#	4	5	B	0		-
21	E30-RANGE-ID	4	5	B	0		-
25	RNGE	3	3	I	-		-
28	SYMBOL	3	3	I	-		-
31	MAPEXBOX#	4	5	B	0		-
35	MAPEXBOX-ID	4	5	B	0		-

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Date	Time	Elap min	CPU sec	I/O opr	Command
4/ 5/89	9:36	0	5	294	CREATE E30-RNG-T TIC_FRAME
4/ 7/89	9:37	0	7	476	copy [.work1]e30-rng-t
3/28/90	9:35	5	52	2532	EXPORT COVER E30-RNG-T DUB1:[PEARL.DENVER]E30-RNG-T.E00

Name of Coverage: E100-RNG-T
Location: DISK$USER3:[DENVER.ESRI]
Summary: The linear transformation of the coverage E100-RANGE. Note that E100-RANGE was developed using the same parameters as [DENVER.JAN20.DEV-30]E30-VTC.
Coverage Type: ESRI
Feature Type: Polygon
Average RMS error: N/A
Input Scale: N/A
Date Produced: 4/5/89

DESCRIPTION OF SINGLE PRECISION COVERAGE E100-RNG-T

ARCS		POLYGONS	
Arcs =	136	Polygons =	67
Segments =	8539	Polygon Topology is present.	
0 bytes of Arc Attribute Data		38 bytes of Polygon Attribute Data	
POINTS		**SECONDARY FEATURES**	
Label Points =	66	Tics =	20
		Annotations =	0
		Links =	0
TOLERANCES		**STATUS**	
Fuzzy =	0.000 N	The coverage has not been Edited	
Dangle =	0.000 N	since the last BUILD or CLEAN.	

COVERAGE BOUNDARY

Xmin =	47.664	Ymin =	17.775
Xmax =	60.665	Ymax =	22.774

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TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E100-RNG-T.PAT	ARC047DAT	67	38	XX
DF	E100-RNG-T.BND	ARC048DAT	1	16	XX
DF	E100-RNG-T.TIC	ARC056DAT	20	12	XX

E100-RNG-T.PAT
67 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E100-RNG-T#	4	5	B	0		-
13	E100-RNG-T-ID	4	5	B	0		-
17	E100-RANGE#	4	5	B	0		-
21	E100-RANGE-ID	4	5	B	0		-
25	RNGE	3	3	I	-		-
28	MAPEXBOX#	4	5	B	0		-
32	MAPEXBOX-ID	4	5	B	0		-
36	SYMBOL	3	3	I	-		-

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Date	Time	Elap min	CPU sec	I/O opr	Command
4/ 5/89	9:23	0	6	694	CREATE E100-RNG-T TIC_FRAME
4/ 7/89	9:36	0	9	862	copy [.work1]e100-rng-t

Name of Coverage: E150-RNG-T
Location: DISK$USER3:[DENVER.ESRI]
Summary: The linear transformation of the coverage E150-RANGE. Note that E150-RANGE was developed using the same parameters as [DENVER.JAN20.DEV-30]E30-VTC.
Coverage Type: ESRI
Feature Type: Polygon
Average RMS error: N/A
Input Scale: N/A
Date Produced: 4/4/89

DESCRIPTION OF SINGLE PRECISION COVERAGE E150-RNG-T

```
         ARCS                                POLYGONS

Arcs          =         96            Polygons    =         59
Segments      =       7689            Polygon Topology is present.
0    bytes of Arc Attribute Data      22   bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =         59            Tics        =         20
                                      Annotations =          0
                                      Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =             0.001 N         The coverage has not been Edited
Dangle  =             0.000 N         since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =                    48.603      Ymin =                    22.444
Xmax =                    60.166      Ymax =                    26.275
```

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TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E150-RNG-T.TIC	ARC035DAT	20	12	XX
DF	E150-RNG-T.BND	ARC036DAT	1	16	XX
DF	E150-RNG-T.PAT	ARC039DAT	59	22	XX

E150-RNG-T.PAT
59 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E150-RNG-T#	4	5	B	0		-
13	E150-RNG-T-ID	4	5	B	0		-
17	RNGE	3	3	I	-		-
20	SYMBOL	3	3	I	-		-

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Date	Time	Elap min	CPU sec	I/O opr	Command
4/ 5/89	9:27	0	4	285	CREATE E150-RNG-T TIC_FRAME
4/ 7/89	9:37	0	8	469	copy [.work1]e150-rng-t
3/27/90	16:21	0	2	88	EXTERNALALL
3/28/90	8:53	0	2	83	EXTERNALALL
3/28/90	9:23	2	46	2366	EXPORT COVER E150-RNG-T DUB1:[PEARL.DENVER]E150-RNG-T.E00

Description of Coverage: E200-RNG-T
Location: DISK$USER3:[DENVER.ESRI]
Summary: The linear transformation of the coverage E200-RANGE. Note that E200-RANGE was developed using the same parameters as [DENVER.JAN20.DEV-30]E30-VTC.
Coverage Type: ESRI
Feature Type: Polygon
Average RMS error: N/A
Input Scale: N/A
Date Produced: 4/4/89

DESCRIPTION OF SINGLE PRECISION COVERAGE E200-RNG-T

```
         ARCS                                POLYGONS

Arcs          =        100            Polygons     =        47
Segments      =       5780            Polygon Topology is present.
0    bytes of Arc Attribute Data      22   bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =         46            Tics         =        20
                                      Annotations  =         0
                                      Links        =         0
         TOLERANCES                          STATUS

Fuzzy   =            0.002 N          The coverage has not been Edited
Dangle  =            0.000 N          since the last BUILD or CLEAN.

                   COVERAGE BOUNDARY

Xmin =                    48.783       Ymin =                    26.459
Xmax =                    60.166       Ymax =                    30.275
```

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TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E200-RNG-T.BND	ARC073DAT	1	16	XX
DF	E200-RNG-T.TIC	ARC074DAT	20	12	XX
DF	E200-RNG-T.PAT	ARC078DAT	47	22	XX

E200-RNG-T.PAT
47 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E200-RNG-T#	4	5	B	0		-
13	E200-RNG-T-ID	4	5	B	0		-
17	RNGE	3	3	I	-		-
20	SYMBOL	3	3	I	-		-

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Date	Time	Elap min	CPU sec	I/O opr	Command
4/ 4/89	13:34	0	5	294	CREATE E200-RNG-T TIC_FRAME
4/ 4/89	13:39	1	12	600	TRANSFORM E200-RNG E200-RNG-T
4/ 5/89	9: 7	3	120	2193	clip e200-rng-t level5-t e200-clip poly .001
4/ 5/89	10:40	4	107	2320	clean e200-clip e200-clip1 .001 .0001
4/ 5/89	10:56	4	62	2162	BUILD E200-CLIP1
4/ 5/89	15:35	0	5	206	RENAME E200-CLIP1 E200-RNG-T

Name of Coverage: E30-VTC-T
Location: DISK$USER3:[DENVER.ESRI]
Summary: The linear transformation of the coverage [DENVER.JAN20.DEV-30]E30-VTC.
Coverage Type: ESRI
Feature Type: Polygon
Average RMS error: N/A
Input Scale: N/A
Date Produced: 4/5/89

DESCRIPTION OF SINGLE PRECISION COVERAGE E30-VTC-T

```
         ARCS                                POLYGONS

Arcs          =        286            Polygons    =          0
Segments      =      12838            There is NO Polygon Topology.
35   bytes of Arc Attribute Data      0    bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =          0            Tics        =         20
                                      Annotations =          0
                                      Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            0.002 N          The coverage has not been Edited
Dangle  =            0.000 N          since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =                    50.724       Ymin =                    14.428
Xmax =                    59.341       Ymax =                    18.284
```

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TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E30-VTC-T.AAT	ARC023DAT	286	35	XX
DF	E30-VTC-T.BND	ARC024DAT	1	16	XX
DF	E30-VTC-T.TIC	ARC025DAT	20	12	XX

E30-VTC-T.AAT
286 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	FNODE#	4	5	B	0		-
5	TNODE#	4	5	B	0		-
9	LPOLY#	4	5	B	0		-
13	RPOLY#	4	5	B	0		-
17	LENGTH	4	12	F	3		-
21	E30-VTC-T#	4	5	B	0		-
25	E30-VTC-T-ID	4	5	B	0		-
29	LIDAR	4	12	F	3		-
33	RNGE	3	3	I	-		-

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Date	Time	Elap min	CPU sec	I/O opr	Command
4/ 5/89	9:34	0	6	708	CREATE E30-VTC-T TIC_FRAME
4/ 7/89	9:38	0	7	391	copy [.work1]e30-vtc-t
3/27/90	16:22	0	2	96	EXTERNALALL
3/28/90	8:53	0	2	83	EXTERNALALL
3/28/90	9:38	3	74	3694	EXPORT COVER E30-VTC-T DUB1:[PEARL.DENVER]E30-VTC-T.E00

Description of Coverage: E100-VTC-T
Location: DISK$USER3:[DENVER.ESRI]
Summary: The linear transformation of the coverage E100-VTC. Note that E100-VTC was developed using the same parameters as [DENVER.JAN20.DEV-30]E30-VTC.
Coverage Type: ESRI
Feature Type: Polygon
Average RMS error: N/A
Input Scale: N/A
Date Produced: 4/5/89

DESCRIPTION OF SINGLE PRECISION COVERAGE E100-VTC-T

```
         ARCS                                POLYGONS

Arcs          =        308            Polygons    =          0
Segments      =      13086            There is NO Polygon Topology.
32   bytes of Arc Attribute Data       0    bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =          0            Tics        =         20
                                      Annotations =          0
                                      Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            0.002 N          The coverage has not been Edited
Dangle  =            0.000 N          since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =                    50.675       Ymin =                    18.435
Xmax =                    59.530       Ymax =                    22.268
```

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TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E100-VTC-T.AAT	ARC041DAT	308	32	XX
DF	E100-VTC-T.BND	ARC045DAT	1	16	XX
DF	E100-VTC-T.TIC	ARC046DAT	20	12	XX

E100-VTC-T.AAT
308 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	FNODE#	4	5	B	0		-
5	TNODE#	4	5	B	0		-
9	LPOLY#	4	5	B	0		-
13	RPOLY#	4	5	B	0		-
17	LENGTH	4	12	F	3		-
21	E100-VTC-T#	4	5	B	0		-
25	E100-VTC-T-ID	4	5	B	0		-
29	LIDAR	4	12	F	3		-

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Date	Time	Elap min	CPU sec	I/O opr	Command
4/ 5/89	9:24	0	4	287	CREATE E100-VTC-T TIC_FRAME
4/ 7/89	9:36	0	6	384	copy [.work1]e100-vtc-t
3/27/90	16:21	0	2	94	EXTERNALALL
3/28/90	8:53	0	2	88	EXTERNALALL
3/28/90	9:21	3	75	3793	EXPORT COVER E100-VTC-T DUB1:[PEARL.DENVER]E100-VTC-T.E00

Description of Coverage: E150-VTC-T
Location: DISK$USER3:[DENVER.ESRI]
Summary: The linear transformation of the coverage E150-VTC. Note that E150-VTC was developed using the same parameters as [DENVER.JAN20.DEV-30]E30-VTC.
Coverage Type: ESRI
Feature Type: Polygon
Average RMS error: N/A
Input Scale: N/A
Date Produced: 4/5/89

DESCRIPTION OF SINGLE PRECISION COVERAGE E150-VTC-T

ARCS		POLYGONS	
Arcs =	244	Polygons =	0
Segments =	10164	There is NO Polygon Topology.	
32 bytes of Arc Attribute Data		0 bytes of Polygon Attribute Data	

POINTS		SECONDARY FEATURES	
Label Points =	0	Tics =	20
		Annotations =	0
		Links =	0

TOLERANCES		STATUS
Fuzzy =	0.002 N	The coverage has not been Edited
Dangle =	0.000 N	since the last BUILD or CLEAN.

COVERAGE BOUNDARY

Xmin =	50.646	Ymin =	22.453
Xmax =	59.460	Ymax =	26.269

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TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E150-VTC-T.AAT	ARC031DAT	244	32	XX
DF	E150-VTC-T.BND	ARC033DAT	1	16	XX
DF	E150-VTC-T.TIC	ARC034DAT	20	12	XX

E150-VTC-T.AAT
244 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	FNODE#	4	5	B	0		-
5	TNODE#	4	5	B	0		-
9	LPOLY#	4	5	B	0		-
13	RPOLY#	4	5	B	0		-
17	LENGTH	4	12	F	3		-
21	E150-VTC-T#	4	5	B	0		-
25	E150-VTC-T-ID	4	5	B	0		-
29	LIDAR	4	12	F	3		-

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Date	Time	Elap min	CPU sec	I/O opr	Command
4/ 5/89	9:29	0	4	298	CREATE E150-VTC-T TIC_FRAME
4/ 7/89	9:37	0	7	388	copy [.work1]e150-vtc-t
3/27/90	16:21	0	2	85	EXTERNALALL
3/28/90	8:53	0	2	83	EXTERNALALL
3/28/90	9:25	2	60	3005	EXPORT COVER E150-VTC-T DUB1:[PEARL.DENVER]E150-VTC-T.E00

Description of Coverage: E200-VTC-T
Location: DISK$USER3:[DENVER.ESRI]
Summary: The linear transformation of the coverage E200-VTC. Note that E200-VTC was developed using the same parameters as [DENVER.JAN20.DEV-30]E30-VTC.
Coverage Type: ESRI
Feature Type: Polygon
Average RMS error: N/A
Input Scale: N/A
Date Produced: 4/5/89

DESCRIPTION OF SINGLE PRECISION COVERAGE E200-VTC-T

```
         ARCS                                POLYGONS

Arcs          =        156            Polygons    =          0
Segments      =       6640            There is NO Polygon Topology.
32   bytes of Arc Attribute Data      0    bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =          0            Tics        =         20
                                      Annotations =          0
                                      Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =             0.002 N         The coverage has not been Edited
Dangle  =             0.000 N         since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =                    48.784       Ymin =                    26.460
Xmax =                    60.286       Ymax =                    30.259
```

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TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E200-VTC-T.TIC	ARC000DAT	20	12	XX
DF	E200-VTC-T.BND	ARC052DAT	1	16	XX
DF	E200-VTC-T.AAT	ARC053DAT	156	32	XX

E200-VTC-T.AAT
156 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	FNODE#	4	5	B	0		-
5	TNODE#	4	5	B	0		-
9	LPOLY#	4	5	B	0		-
13	RPOLY#	4	5	B	0		-
17	LENGTH	4	12	F	3		-
21	E200-VTC-T#	4	5	B	0		-
25	E200-VTC-T-ID	4	5	B	0		-
29	LIDAR	4	12	F	3		-

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Date	Time	Elap min	CPU sec	I/O opr	Command
4/ 4/89	13:35	0	5	295	CREATE E200-VTC-T TIC_FRAME
4/ 4/89	13:38	1	8	356	TRANSFORM E200-VTC E200-VTC-T
3/27/90	16:21	0	2	88	EXTERNALALL
3/28/90	8:53	0	2	84	EXTERNALALL
3/28/90	9:30	5	44	2078	EXPORT COVER E200-VTC-T DUB1:[PEARL.DENVER]E200-VTC-T.E00

Description of Coverage: LAYERS
Location: DISK$USER3:[DENVER.ESRI]
Summary: Layers is the five vertical elements which define the plot perspective.
Coverage Type: ESRI
Feature Type: NET
Average RMS error: N/A
Input Scale: N/A
Date Produced: 4/7/89

DESCRIPTION OF SINGLE PRECISION COVERAGE LAYERS

ARCS		POLYGONS	
Arcs =	20	Polygons =	8
Segments =	35	Polygon Topology is present.	
28 bytes of Arc Attribute Data		19 bytes of Polygon Attribute Data	

POINTS		SECONDARY FEATURES	
Label Points =	2	Tics =	20
		Annotations =	0
		Links =	0

TOLERANCES		STATUS
Fuzzy =	0.001 V	The coverage has not been Edited
Dangle =	0.001 V	since the last BUILD or CLEAN.

COVERAGE BOUNDARY

Xmin =	47.659	Ymin =	10.483
Xmax =	60.665	Ymax =	30.774

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TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	LAYERS.AAT	ARC072DAT	13	28	XX
DF	LAYERS.TIC	ARC075DAT	20	12	XX
DF	LAYERS.BND	ARC076DAT	1	16	XX
DF	LAYERS.PAT	ARC093DAT	8	19	XX

LAYERS.PAT
8 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	LAYERS#	4	5	B	0		-
13	LAYERS-ID	4	5	B	0		-
17	SYMBOL	3	3	I	-		-

LAYERS.AAT
20 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	FNODE#	4	5	B	0		-
5	TNODE#	4	5	B	0		-
9	LPOLY#	4	5	B	0		-
13	RPOLY#	4	5	B	0		-
17	LENGTH	4	12	F	3		-
21	LAYERS#	4	5	B	0		-
25	LAYERS-ID	4	5	B	0		-

LAYERS Continued...

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Date	Time	Elap min	CPU sec	I/O opr	Command
4/ 5/89	10:54	1	12	679	BUILD LAYERS LINE
4/ 7/89	10:53	3	39	2306	CLEAN LAYERS # .001 .001
3/27/90	16:22	0	4	166	EXTERNALALL
3/28/90	8:53	0	4	124	EXTERNALALL
3/28/90	9:39	0	10	445	EXPORT COVER LAYERS DUB1:[PEARL.DENVER]LAYERS.E00

Description of Coverage: LEVEL1-T, LEVEL2-T, LEVEL3-T, LEVEL4-T, LEVEL5-T
Location: DISK$USER3:[DENVER.ESRI]
Summary: Transformed coverages used to display each vertical level
Coverage Type: ESRI
Feature Type: NET
Average RMS error: N/A
Input Scale: N/A
Date Produced: 4/5/89

DESCRIPTION OF SINGLE PRECISION COVERAGE LEVEL1,2,3,4,5-T

```
         ARCS                                POLYGONS

Arcs          =          1            Polygons    =          2
Segments      =          4            Polygon Topology is present.
28   bytes of Arc Attribute Data       16   bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =          0            Tics        =         20
                                      Annotations =          0
                                      Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            0.000 N          The coverage has not been Edited
Dangle  =            0.000 N          since the last BUILD or CLEAN.
```

Description of Coverage: ROADS-T
Location: DISK$USER3:[DENVER.ESRI]
Summary: The linear transformation of the coverage [DENVER.PI]ROADS.
Coverage Type: ESRI
Feature Type: Polygon
Average RMS error: N/A
Input Scale: N/A
Date Produced: 3/30/89

DESCRIPTION OF SINGLE PRECISION COVERAGE ROADS-T

```
         ARCS                                POLYGONS

Arcs          =       1489            Polygons    =          0
Segments      =       5898            There is NO Polygon Topology.
42   bytes of Arc Attribute Data      0    bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =          0            Tics        =         16
                                      Annotations =          0
                                      Links       =          0

         TOLERANCES                          STATUS

Fuzzy   =            0.001 N          The coverage has not been Edited
Dangle  =            0.000 N          since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =                    47.619       Ymin =                    10.851
Xmax =                    60.685       Ymax =                    15.769
```

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TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	ROADS-T.TIC	ARC008DAT	16	12	XX
DF	ROADS-T.BND	ARC009DAT	1	16	XX
DF	ROADS-T.AAT	ARC010DAT	1489	42	XX

ROADS-T.AAT
1489 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	FNODE#	4	5	B	0		-
5	TNODE#	4	5	B	0		-
9	LPOLY#	4	5	B	0		-
13	RPOLY#	4	5	B	0		-
17	LENGTH	4	12	F	3		-
21	ROADS-T#	4	5	B	0		-
25	ROADS-T-ID	4	5	B	0		-
29	FEATURE	4	4	I	-		-
33	SEARCH	10	10	C	-		-

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Date	Time	Elap min	CPU sec	I/O opr	Command
3/30/89	15:54	0	6	720	CREATE ROADS-TRANS [DENVER.DEV]TIC_FRAME
3/30/89	15:56	1	24	873	TRANSFORM ROADS ROADS-TRANS
3/31/89	8: 7	0	6	401	copy [denver.graph-covers]roads-trans

Description of Coverage: TRANS-T
Location: DISK$USER3:[DENVER.ESRI]
Summary: The linear transformation of the coverage [DENVER.JAN20.FLT]FLIGHT_DBC-U..
Coverage Type: ESRI
Feature Type: Polygon
Average RMS error: N/A
Date Produced: 4/5/89

DESCRIPTION OF SINGLE PRECISION COVERAGE TRANS-T

ARCS		POLYGONS	
Arcs =	11	Polygons =	0
Segments =	3904	There is NO Polygon Topology.	
49 bytes of Arc Attribute Data		0 bytes of Polygon Attribute Data	

POINTS		SECONDARY FEATURES	
Label Points =	205	Tics =	20
20 bytes of Attribute Data/Point		Annotations =	33
		Links =	0

TOLERANCES		STATUS
Fuzzy =	0.002 N	The coverage has not been Edited
Dangle =	0.000 N	since the last BUILD or CLEAN.

COVERAGE BOUNDARY

Xmin =	48.466	Ymin =	11.519
Xmax =	60.450	Ymax =	15.283

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TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	TRANS-T.AAT	ARC051DAT	11	49	XX
DF	TRANS-T.PAT	ARC069DAT	205	20	XX
DF	TRANS-T.BND	ARC070DAT	1	16	XX
DF	TRANS-T.TIC	ARC071DAT	20	12	XX

TRANS-T.AAT
11 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	FNODE#	4	5	B	0		-
5	TNODE#	4	5	B	0		-
9	LPOLY#	4	5	B	0		-
13	RPOLY#	4	5	B	0		-
17	LENGTH	4	12	F	3		-
21	TRANS-T#	4	5	B	0		-
25	TRANS-T-ID	4	5	B	0		-
29	TIN_FLAG	3	3	I	-		-
32	FLIGHT	3	3	I	-		-
35	TAPE	5	5	C	-		-
40	START.TIME	5	5	N	2		-
45	END.TIME	5	5	N	2		-

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Date	Time	Elap min	CPU sec	I/O opr	Command
4/ 5/89	13: 1	0	7	718	CREATE TRANS-T TIC_FRAME
4/ 5/89	13: 2	0	12	942	TRANSFORM [DENVER.JAN20.FLT]FLIGHT_DBC-U TRANS-T

Description of Coverage: TIC_FRAME
Location: DISK$USER3:[DENVER.ESRI]
Summary: TIC_FRAME contains annotation and vertical arcs providing plot perspective.
Coverage Type: ESRI
Feature Type: LINE
Average RMS error: N/A
Input Scale: N/A
Date Produced: 5/17/88

DESCRIPTION OF SINGLE PRECISION COVERAGE TIC_FRAME

ARCS		POLYGONS	
Arcs =	70	Polygons =	0
Segments =	70	There is NO Polygon Topology.	
31 bytes of Arc Attribute Data		0 bytes of Polygon Attribute Data	

POINTS		SECONDARY FEATURES	
Label Points =	16	Tics =	20
		Annotations =	4
		Links =	39

TOLERANCES		STATUS
Fuzzy =	0.002 N	Coverage has 147 edit mask(s), use
Dangle =	0.000 N	BUILD or CLEAN to restore topology

COVERAGE BOUNDARY

Xmin =	47.656	Ymin =	10.845
Xmax =	61.019	Ymax =	30.790

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TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	TIC_FRAME.BND	ARC012DAT	1	16	XX
DF	TIC_FRAME.TIC	ARC013DAT	20	12	XX
DF	TIC_FRAME.AAT	ARC038DAT	70	31	XX

TIC_FRAME.AAT
70 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	FNODE#	4	5	B	0		-
5	TNODE#	4	5	B	0		-
9	LPOLY#	4	5	B	0		-
13	RPOLY#	4	5	B	0		-
17	LENGTH	4	12	F	3		-
21	TIC_FRAME#	4	5	B	0		-
25	TIC_FRAME-ID	4	5	B	0		-
29	SYMBOL	3	3	I	-		-

LOG 03/28/90

Date	Time	Elap min	CPU sec	I/O opr	Command
5/17/88	13:54	1	11	665	BUILD TIC_FRAME LINE
5/23/88	9:48	0	1	67	EXTERNALALL
3/31/89	8:10	1	7	404	copy [denver.dev]tic_frame

LIDAR

Surface analysis was performed for Lidar data collection missions conducted on January 13th, 1988 and January 20th, 1988. LIDAR was integrated into ARC/INFO based on elevations above ground level (AGL). The relative nature of LIDAR precludes comparisons between days. All LIDAR data ranges from 0 through 255.

January 13 and January 20 analysis are organized in system directories JAN13 and JAN20, respectively. Sub-directories store analysis based on AGL. Directory DEV-30 organized various coverages which represented analysis for 30 meters AGL. A standard naming convention was adopted for each of these Lidar coverages. For example, the directory DEV-30 will contain the following ARC/INFO coverages:

E30_APP: Point file representing raw Lidar values for various transects.
E30-RANGE: Lidar returns represented as a set of discrite range values.
E30-TIN: TIN based on a proximal sample of Lidar values
E30-VIP: Points most important in representing the surface.
E30-VT: TIN created from E30-VIP.
E30-VTC: Lidar Contours from E30-VT.
E30-VTLP: Polygon coverage created from LATTICE file E30-VTL.LAT.
INFO: Contains INFO database files externalled to each ARC/INFO coverage.

Within each Lidar Surface Directory there exists a file recording all specification used to create each of these ARC/INFO coverages. This file is named "ARCTIN_999999.999999" (Where "9" represents the data and time stamp when this file was created).

JAN13 (January 13, 1988 Lidar Collection Mission)

Listings for January 13, 1988 are organized by directories DEV-30, DEV-50, DEV-60, DEV-80 and FLT.

I. DEV-30 (Lidar surfaces generated based on 30 meters AGL).

Name of Coverage: E30_APP
Location: DISK$USER3:[DENVER.JAN13.DEV-30]
Summary: E30_APP represents Lidar return values collected 1/13/88 at 30 meters AGL from 08:00 to 09:44. Mission data was organized by transect and was obtained from data file [denver.exe]DB3.GND. Data was generated from locational values collected at time of mission.
Coverage Type: Lidar
Feature Type: Point
Input Scale: N/A
Digitized by: N/A
Date Produced: 11/1/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E30_APP

```
         ARCS                                POLYGONS

Arcs          =          0            Polygons     =          0
Segments      =          0            There is NO Polygon Topology.
0    bytes of Arc Attribute Data       0    bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =       4008             Tics         =          4
37   bytes of Attribute Data/Point     Annotations  =          0
                                       Links        =          0
         TOLERANCES                          STATUS

Fuzzy   =            6.295 N           The coverage has not been Edited
Dangle  =            0.000 N           since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =               463284.469        Ymin =               385006.719
Xmax =               531264.125        Ymax =               447956.094
```

ITEMS 03/26/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E30_APP.TIC	ARC001DAT	4	12	XX
DF	E30_APP.BND	ARC002DAT	1	16	XX
DF	E30_APP.PAT	ARC004DAT	4008	37	XX

E30_APP.PAT
4008 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E30_APP#	4	5	B	0		-
13	E30_APP-ID	4	5	B	0		-
17	LIDAR	3	3	I	-		-
20	FLIGHT	3	3	I	-		-
23	TAPE	5	5	C	-		-
28	START.TIME	5	5	N	2		-
33	END.TIME	5	5	N	2		-

E30_APP Continued...

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Date	Time	Elap min	CPU sec	I/O opr	Command
11/ 1/88	8:14	2	59	1214	APPEND E30_APP-21 POINT FEATURES
11/ 1/88	8:16	3	104	859	BUILD E30_APP-21 point
11/ 1/88	8:31	2	93	835	build e30_app-21 point
11/ 1/88	8:32	0	8	791	copy [denver.jan13.dev-30-old]e30_app-21
11/ 1/88	8:32	0	2	158	rename e30_app-21 e30_app
3/26/90	10: 7	0	1	74	EXTERNALALL
3/26/90	10:16	0	1	77	EXTERNALALL

Name of Coverage: E30-TIN
Location: DISK$USER3:[DENVER.JAN13.DEV-30]
Summary: A TIN created from E30_APP using a proximal sampling distance of 1000 meters. E30-TIN is the first surface model in a series of surface generations.
Coverage Type: Lidar
Feature Type: TIN
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/1/88

TIN DESCRIPTION FOR E30-TIN

Tin Topology

Nodes	= 404	Triangles	= 762
Hull nodes	= 44		

Surface value range

Min Z	= 0.000	Max Z	= 113.000

Tin Boundary

Xmin = 463284.469	Ymin = 385006.719
Xmax = 531264.125	Ymax = 447954.906

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Date	Time	Elap min	CPU sec	I/O opr	Command
11/ 1/88	16:27	1	28	739	ARCTIN E30_APP E30-TIN POINT LIDAR # 1000
3/26/90	10: 6	0	2	118	EXTERNALALL
3/26/90	10:15	0	3	135	EXTERNALALL

Name of Lattice: E30-LAT.LAT
Location: DISK$USER3:[DENVER.JAN13.DEV-30]
Summary: A LATTICE created from TIN E30-TIN. A LATTICE is a binary system file which is interpolated from TIN based on starting origin, and number of points in X/Y direction. E30-LAT.LAT was used to create the VIP coverage E30-VIP.
Coverage Type: Lidar
Feature Type: LATTICE
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

Lattice description for E30-LAT.LAT

Lattice size and origin

Points in X/Y = 250 250 Origin (x,y)= 463284.469 385006.719

Lattice distance between points

Distance in X = 273.011 Distance in Y = 252.804

Surface value range

Min Z = 0.000 Max Z = 113.000

Lattice boundary

Xmin = 463284.469 Ymin = 385006.719
Xmax = 531264.125 Ymax = 447954.906

Name of Coverage: E30-VIP
Location: DISK$USER3:[DENVER.JAN13.DEV-30]
Summary: E30-VIP is a point coverage which represents, based on a 15% sample of E30-LAT.LAT, the Lidar "Z" values which were most important in describing the surface. Two attributes SPOT, representing Lidar "Z" values, and SFCODE are contained in the INFO file E30-VIP.PAT. SFCODE was a SPOT feature code, coded as one of the following:

2 for a surface maximum or convexity.
-2 for a surface minimum or concavity
1 for an inflection or transition close to a maximum
-1 an inflection or transition feature close to a minimum
0 for a point that is both a local surface maximum and a local surface surface minimum.

Coverage Type: Lidar
Feature Type: Point
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/1/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E30-VIP

ARCS		POLYGONS	
Arcs =	0	Polygons =	0
Segments =	0	There is NO Polygon Topology.	
0 bytes of Arc Attribute Data		0 bytes of Polygon Attribute Data	

POINTS		SECONDARY FEATURES	
Label Points =	9585	Tics =	4
24 bytes of Attribute Data/Point		Annotations =	0
		Links =	0

TOLERANCES		STATUS
Fuzzy =	6.244 N	The coverage has not been Edited
Dangle =	0.000 N	since the last BUILD or CLEAN.

COVERAGE BOUNDARY

Xmin =	464376.500	Ymin =	385259.500
Xmax =	529899.063	Ymax =	447699.281

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TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E30-VIP.BND	ARC015DAT	1	16	XX
DF	E30-VIP.TIC	ARC016DAT	4	12	XX
DF	E30-VIP.PAT	ARC017DAT	9585	24	XX

E30-VIP.PAT
9585 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E30-VIP#	4	5	B	0		-
13	E30-VIP-ID	4	5	B	0		-
17	SPOT	4	12	F	3		-
21	SFCODE	4	5	B	0		-

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Date	Time	Elap min	CPU sec	I/O opr	Command
11/ 1/88	16:11	4	59	777	VIP E30-LAT E30-VIP 15

Name of Coverage: E30-VT
Location: DISK$USER3:[DENVER.JAN13.DEV-30]
Summary: A TIN created from coverage E30-VIP using a proximal sampling distance of 1500 meters.
Coverage Type: Lidar
Feature Type: TIN
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/1/88

TIN DESCRIPTION FOR E30-VT

Tin Topology

Nodes = 749 Triangles = 1455
Hull nodes = 41

Surface value range

Min Z = 0.000 Max Z = 90.569

Tin Boundary

Xmin = 464649.531 Ymin = 385259.500
Xmax = 528807.063 Ymax = 447699.281

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Date	Time	Elap min	CPU sec	I/O opr	Command
11/ 1/88	16:40	1	44	775	ARCTIN E30-VIP E30-VT POINT SPOT # 1500
3/26/90	10: 6	0	2	118	EXTERNALALL
3/26/90	10:16	0	3	134	EXTERNALALL

Name of Coverage: E30-VT-HULL
Location: DISK$USER3:[DENVER.JAN13.DEV-30]
Summary: A coverage representing the boundary extent of TIN E30-VT. This coverage was used to set mapextents for plotting and creating views.
Coverage Type: Lidar
Feature Type: Polygon
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/1/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E30-VT-HULL

ARCS		POLYGONS	
Arcs =	41	Polygons =	2
Segments =	41	Polygon Topology is present.	
0 bytes of Arc Attribute Data		16 bytes of Polygon Attribute Data	

POINTS		SECONDARY FEATURES	
Label Points =	0	Tics =	4
		Annotations =	0
		Links =	0

TOLERANCES		STATUS
Fuzzy =	6.244 N	The coverage has not been Edited
Dangle =	0.000 N	since the last BUILD or CLEAN.

COVERAGE BOUNDARY

Xmin =	464649.531	Ymin =	385259.500
Xmax =	528807.063	Ymax =	447699.281

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TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E30-VT-HULL.BND	ARC022DAT	1	16	XX
DF	E30-VT-HULL.TIC	ARC023DAT	4	12	XX
DF	E30-VT-HULL.PAT	ARC027DAT	3	16	XX

E30-VT-HULL.PAT
3 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E30-VT-HULL#	4	5	B	0		-
13	E30-VT-HULL-ID	4	5	B	0		-

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Date	Time	Elap min	CPU sec	I/O opr	Command
11/ 2/88	11:38	1	10	907	tinarc e30-vt e30-vt-hull hull
3/26/90	10: 6	0	1	81	EXTERNALALL
3/26/90	10:16	0	1	81	EXTERNALALL

Name of Coverage: E30-VTC
Location: DISK$USER3:[DENVER.JAN13.DEV-30]
Summary: A Lidar contour coverage at intervals of 10 Lidar Units. E30-VTC was interpolated from E30-VT. Contours range from 10 to 80 Lidar Units.
Coverage Type: Lidar
Feature Type: Line
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/1/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E30-VTC

ARCS		POLYGONS	
Arcs =	189	Polygons =	0
Segments =	5752	There is NO Polygon Topology.	
32 bytes of Arc Attribute Data		0 bytes of Polygon Attribute Data	

POINTS		SECONDARY FEATURES	
Label Points =	0	Tics =	4
		Annotations =	0
		Links =	0

TOLERANCES		STATUS
Fuzzy =	6.243 N	The coverage has not been Edited
Dangle =	0.000 N	since the last BUILD or CLEAN.

COVERAGE BOUNDARY

Xmin =	464655.938	Ymin =	385265.750
Xmax =	528800.625	Ymax =	447693.031

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TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E30-VTC.AAT	ARC019DAT	189	32	XX
DF	E30-VTC.TIC	ARC020DAT	4	12	XX
DF	E30-VTC.BND	ARC021DAT	1	16	XX

E30-VTC.AAT
189 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	FNODE#	4	5	B	0		-
5	TNODE#	4	5	B	0		-
9	LPOLY#	4	5	B	0		-
13	RPOLY#	4	5	B	0		-
17	LENGTH	4	12	F	3		-
21	E30-VTC#	4	5	B	0		-
25	E30-VTC-ID	4	5	B	0		-
29	LIDAR	4	12	F	3		-

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Date	Time	Elap min	CPU sec	I/O opr	Command
11/ 1/88	16:47	7	228	531	TINCONTOUR E30-VT E30-VTC 10 0 LIDAR SMOOTH
3/26/90	10: 7	0	1	76	EXTERNALALL
3/26/90	10:16	0	1	76	EXTERNALALL

Name of Lattice: E30-VTL.LAT
Location: DISK$USER3:[DENVER.JAN13.DEV-30]
Summary: A LATTICE created from TIN E30-VT. A LATTICE is a binary system file which is interpolated from TIN based on starting origin, and number of points in X/Y direction. E30-VTL.LAT was used to create polygon coverage E30-VTLP.
Coverage Type: Lidar
Feature Type: LATTICE
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

LATTICE DESCRIPTION FOR E30-VTL.LAT

Lattice size and origin

Points in X/Y = 250 250 Origin (x,y)= 464649.531 385259.500

Lattice distance between points

Distance in X = 257.661 Distance in Y = 250.762

Surface value range

Min Z = 0.000 Max Z = 86.644

Lattice boundary

Xmin = 464649.531 Ymin = 385259.500
Xmax = 528807.063 Ymax = 447699.281

Name of Coverage: E30-VTLP
Location: DISK$USER3:[DENVER.JAN13.DEV-30]
Summary: A polygon coverage representing Lidar backscatter based on 5 Lidar Unit intervals. Interpolated from LATTICE E30-VTL using the INFO lookup table LIDAR2_LKUP. Lidar ranges from 5 to a maximum value of 90.
Coverage Type: Lidar
Feature Type: Polygon
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/1/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E30-VTLP

```
         ARCS                                POLYGONS

Arcs          =       1864            Polygons    =        824
Segments      =      18576            Polygon Topology is present.
0    bytes of Arc Attribute Data      23   bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =        823            Tics        =          4
                                      Annotations =          0
                                      Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            6.269 N          The coverage has not been Edited
Dangle  =            0.000 N          since the last BUILD or CLEAN.

                   COVERAGE BOUNDARY

Xmin =               464907.188       Ymin =               385259.500
Xmax =               529064.750       Ymax =               447950.031
```

ITEMS 03/26/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E30-VTLP.TIC	ARC028DAT	4	12	XX
DF	E30-VTLP.BND	ARC029DAT	1	16	XX
DF	E30-VTLP.PAT	ARC030DAT	824	23	XX

E30-VTLP.PAT
824 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E30-VTLP#	4	5	B	0		-
13	E30-VTLP-ID	4	5	B	0		-
17	RANGE-CODE	4	5	B	0		-
21	RNGE	3	3	I	-		-

LOG 03/26/90

Date	Time	Elap min	CPU sec	I/O opr	Command
11/ 2/88	9:17	3	77	2142	ELIMINATE E30-VTLP E30-VTLP-ELIM NOKEEPEDGE POLY
11/ 2/88	9:32	0	3	179	RENAME E30-VTLP-ELIM E30-VTLP
3/26/90	10: 7	0	2	81	EXTERNALALL
3/26/90	10:16	0	2	81	EXTERNALALL

Name of Coverage: E30-RANGE-M
Location: DISK$USER3:[DENVER.JAN13.DEV-30]
Summary: E30-RANGE-M represents Lidar intensities at 8 specific ranges coded as: 11, 22, 34, 45, 56, 67, 78 and > 78. E30-RANGE-M was dissolved from E30-VTLP based on these eight Lidar intensities.
Coverage Type: Lidar
Feature Type: Polygon
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E30-RANGE-M

ARCS		POLYGONS	
Arcs =	201	Polygons =	108
Segments =	9380	Polygon Topology is present.	
0 bytes of Arc Attribute Data		22 bytes of Polygon Attribute Data	

POINTS		SECONDARY FEATURES	
Label Points =	107	Tics =	4
		Annotations =	0
		Links =	0

TOLERANCES		STATUS
Fuzzy =	6.269 N	The coverage has not been Edited
Dangle =	0.000 N	since the last BUILD or CLEAN.

COVERAGE BOUNDARY

Xmin =	464907.188	Ymin =	385259.500
Xmax =	529064.750	Ymax =	447950.031

ITEMS 03/26/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E30-RANGE-M.BND	ARC025DAT	1	16	XX
DF	E30-RANGE-M.TIC	ARC026DAT	4	12	XX
DF	E30-RANGE-M.PAT	ARC032DAT	108	22	XX

E30-RANGE-M.PAT
108 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E30-RANGE-M#	4	5	B	0		-
13	E30-RANGE-M-ID	4	5	B	0		-
17	RNGE	3	3	I	-		-
20	RANGE-CODE	3	3	I	-		-

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Date	Time	Elap min	CPU sec	I/O opr	Command
11/ 2/88	10:25	5	69	3114	DISSOLVE E30-VTLP E30-RANGE-M RNGE
3/26/90	10: 6	0	2	78	EXTERNALALL
3/26/90	10:15	0	2	81	EXTERNALALL

II. DEV-50 (Lidar surfaces generated based on 50 meters AGL).

Name of Coverage: E50_APP
Location: DISK$USER3:[DENVER.JAN13.DEV-50]
Summary: E50_APP represents Lidar return values collected 1/13/88 at 50 meters AGL from 08:00 to 09:44. Mission data was organized by transect and was obtained from data file [denver.exe]DB3.GND. Data was generated from locational values collected at time of mission.
Coverage Type: Lidar
Feature Type: Point
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E50_APP

```
         ARCS                                POLYGONS

Arcs          =          0             Polygons    =          0
Segments      =          0             There is NO Polygon Topology.
0    bytes of Arc Attribute Data        0    bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =       3599             Tics        =          4
22   bytes of Attribute Data/Point     Annotations =          0
                                       Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            6.295 N           The coverage has not been Edited
Dangle  =            0.000 N           since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =               463284.469        Ymin =               385006.719
Xmax =               531264.125        Ymax =               447956.094
```

ITEMS 03/26/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E50_APP.PAT	ARC000DAT	3599	22	XX
DF	E50_APP.TIC	ARC020DAT	4	12	XX
DF	E50_APP.BND	ARC024DAT	1	16	XX

E50_APP.PAT
3599 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E50_APP#	4	5	B	0		-
13	E50_APP-ID	4	5	B	0		-
17	LIDAR	3	3	I	-		-
20	FLIGHT	3	3	I	-		-

LOG 03/26/90

Date	Time	Elap min	CPU sec	I/O opr	Command
11/ 1/88	18:25	2	63	1344	APPEND E50_APP POINT FEATURES
11/ 1/88	18:28	3	84	826	BUILD E50_APP POINT
3/26/90	13:13	9	124	5153	export cover E50_APP dub1:[pearl.denver]J13-E50_APP.e00

Name of Coverage: E50-TIN
Location: DISK$USER3:[DENVER.JAN13.DEV-50]
Summary: A TIN created from E50_APP using a proximal sampling distance of 1000 meters. E50-TIN is the first surface model in a series of surface generations.
Coverage Type: Lidar
Feature Type: TIN
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/1/88

TIN DESCRIPTION FOR E50-TIN

Tin Topology

Nodes	= 357	Triangles	= 668
Hull nodes	= 44		

Surface value range

Min Z	= 0.000	Max Z	= 88.000

Tin Boundary

Xmin = 463284.469	Ymin = 385006.719
Xmax = 531264.125	Ymax = 447954.906

LOG 03/26/90

Date	Time	Elap min	CPU sec	I/O opr	Command
11/ 2/88	8:15	1	25	1066	ARCTIN E50_APP E50-TIN POINT LIDAR # 1000
3/26/90	10:26	0	2	120	EXTERNALALL

Name of Lattice: E50-LAT.LAT
Location: DISK$USER3:[DENVER.JAN13.DEV-50]
Summary: A LATTICE created from TIN E50-TIN. A LATTICE is a binary system file which is interpolated from TIN based on starting origin, and number of points in X/Y direction. E50-LAT.LAT was used to create the VIP coverage E50-VIP.
Coverage Type: Lidar
Feature Type: LATTICE
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

LATTICE DESCRIPTION FOR E50-LAT.LAT

Lattice size and origin

Points in X/Y = 250 250 Origin (x,y)= 463284.469 385006.719

Lattice distance between points

Distance in X = 273.011 Distance in Y = 252.804

Surface value range

Min Z = 0.000 Max Z = 78.110

Lattice boundary

Xmin = 463284.469 Ymin = 385006.719
Xmax = 531264.125 Ymax = 447954.906

Name of Coverage: E50-VIP
Location: DISK$USER3:[DENVER.JAN13.DEV-50]
Summary: E50-VIP is a point coverage which represents, based on a 15% sample of E50-LAT.LAT, the Lidar "Z" values which were most important in describing the surface. Two attributes SPOT, representing Lidar "Z" values, and SFCODE are contained in the INFO file E50-VIP.PAT. SFCODE was a SPOT feature code, coded as one of the following:

2 for a surface maximum or convexity.
-2 for a surface minimum or concavity
1 for an inflection or transition close to a maximum
-1 an inflection or transition feature close to a minimum
0 for a point that is both a local surface maximum and a local surface surface minimum.

Coverage Type: Lidar
Feature Type: Point
Input Scale: N/A
Date Produced: 11/2/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E50-VIP

```
         ARCS                                POLYGONS

Arcs          =          0            Polygons    =          0
Segments      =          0            There is NO Polygon Topology.
0    bytes of Arc Attribute Data       0    bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =       9568            Tics        =          4
24   bytes of Attribute Data/Point    Annotations =          0
                                      Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            6.244 N          The coverage has not been Edited
Dangle  =            0.000 N          since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =               463830.500       Ymin =               385259.531
Xmax =               529899.063       Ymax =               447702.094
```

ITEMS 03/26/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E50-VIP.BND	ARC043DAT	1	16	XX
DF	E50-VIP.TIC	ARC045DAT	4	12	XX
DF	E50-VIP.PAT	ARC046DAT	9568	24	XX

E50-VIP.PAT
9568 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E50-VIP#	4	5	B	0		-
13	E50-VIP-ID	4	5	B	0		-
17	SPOT	4	12	F	3		-
21	SFCODE	4	5	B	0		-

LOG 03/26/90

Date	Time	Elap min	CPU sec	I/O opr	Command
11/ 2/88	8:19	2	58	808	VIP E50-LAT E50-VIP 15

Name of Coverage: E50-VT
Location: DISK$USER3:[DENVER.JAN13.DEV-50]
Summary: A TIN created from coverage E50-VIP using a proximal sampling distance of 1500 meters.
Coverage Type: Lidar
Feature Type: TIN
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/1/88

TIN DESCRIPTION FOR E50-VT

Tin Topology

Nodes = 748 Triangles = 1464
Hull nodes = 30

Surface value range

Min Z = 0.000 Max Z = 78.110

Tin Boundary

Xmin = 464376.500 Ymin = 385259.531
Xmax = 529899.063 Ymax = 447702.094

LOG 03/26/90

Date	Time	Elap min	CPU sec	I/O opr	Command
11/ 2/88	8:20	1	41	381	ARCTIN E50-VIP E50-VT POINT SPOT # 1500
3/26/90	10:27	0	2	122	EXTERNALALL
3/26/90	12:47	0	6	234	export cover E50-VT dubl:[pearl.denver]J13-E50-VT.e00

Name of Coverage: E50-VT-HULL
Location: DISK$USER3:[DENVER.JAN13.DEV-50]
Summary: A coverage representing the boundary extent of TIN E50-VT. This coverage was used to set mapextents for plotting and creating views.
Coverage Type: Lidar
Feature Type: Polygon
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E50-VT-HULL

```
         ARCS                                POLYGONS

Arcs          =          30            Polygons    =          2
Segments      =          30            Polygon Topology is present.
0    bytes of Arc Attribute Data       16   bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =           0            Tics        =          4
                                       Annotations =          0
                                       Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =             6.244 N          The coverage has not been Edited
Dangle  =             0.000 N          since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =                464376.500       Ymin =                385259.531
Xmax =                529899.063       Ymax =                447702.094
```

ITEMS 03/26/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E50-VT-HULL.BND	ARC038DAT	1	16	XX
DF	E50-VT-HULL.TIC	ARC039DAT	4	12	XX
DF	E50-VT-HULL.PAT	ARC041DAT	3	16	XX

E50-VT-HULL.PAT
3 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E50-VT-HULL#	4	5	B	0		-
13	E50-VT-HULL-ID	4	5	B	0		-

LOG 03/26/90

```
   Date     Time Elap  CPU   I/O  Command
                 min  sec   opr
 -------- ----- ---- ----  ---- ----------------
 11/ 2/88 15:33   1    11  1269 tinarc e50-vt e50-vt-hull hull
  3/26/90 10:27   0     2    82 EXTERNALALL
  3/26/90   12:47        0             8        355          export   cover   E50-VT-HULL
dub1:[pearl.denver]J13-E50-VT-HULL.e00
```

Name of Coverage: E50-VTC
Location: DISK$USER3:[DENVER.JAN13.DEV-50]
Summary: A Lidar contour coverage at intervals of 10 Lidar Units. E50-VTC was interpolated from E50-VT. Contours range from 10 to 70 Lidar Units.
Coverage Type: Lidar
Feature Type: Line
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E50-VTC

ARCS		POLYGONS	
Arcs =	165	Polygons =	0
Segments =	4310	There is NO Polygon Topology.	
32 bytes of Arc Attribute Data		0 bytes of Polygon Attribute Data	

POINTS		SECONDARY FEATURES	
Label Points =	0	Tics =	4
		Annotations =	0
		Links =	0

TOLERANCES		STATUS
Fuzzy =	6.243 N	The coverage has not been Edited
Dangle =	0.000 N	since the last BUILD or CLEAN.

COVERAGE BOUNDARY

Xmin =	464383.063	Ymin =	385265.781
Xmax =	529892.500	Ymax =	447695.844

ITEMS 03/26/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E50-VTC.BND	ARC033DAT	1	16	XX
DF	E50-VTC.TIC	ARC034DAT	4	12	XX
DF	E50-VTC.AAT	ARC037DAT	165	32	XX

E50-VTC.AAT
165 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	FNODE#	4	5	B	0		-
5	TNODE#	4	5	B	0		-
9	LPOLY#	4	5	B	0		-
13	RPOLY#	4	5	B	0		-
17	LENGTH	4	12	F	3		-
21	E50-VTC#	4	5	B	0		-
25	E50-VTC-ID	4	5	B	0		-
29	LIDAR	4	12	F	3		-

LOG 03/26/90

Date	Time	Elap min	CPU sec	I/O opr	Command
11/ 2/88	8:24	4	194	524	TINCONTOUR E50-VT E50-VTC 10 0 LIDAR SMOOTH
3/26/90	10:27	0	2	82	EXTERNALALL
3/26/90	12:50	3	34	1563	export cover E50-VTC dub1:[pearl.denver]J13-E50-VTC.e00

Name of Lattice: E50-VTL.LAT
Location: DISK$USER3:[DENVER.JAN13.DEV-50]
Summary: A LATTICE created from TIN E50-VT. A LATTICE is a binary system file which is interpolated from TIN based on starting origin, and number of points in X/Y direction. E50-VTL.LAT was used to create polygon coverage E50-VTLP.
Coverage Type: Lidar
Feature Type: LATTICE
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

LATTICE DESCRIPTION FOR E50-VTL.LAT

Lattice size and origin

Points in X/Y = 250 250 Origin (x,y)= 464376.500 385259.531

Lattice distance between points

Distance in X = 263.143 Distance in Y = 250.773

Surface value range

Min Z = 0.000 Max Z = 78.110

Lattice boundary

Xmin = 464376.500 Ymin = 385259.531
Xmax = 529899.063 Ymax = 447702.094

Name of Coverage: E50-VTLP
Location: DISK$USER3:[DENVER.JAN13.DEV-50]
Summary: A polygon coverage representing Lidar backscatter based on 5 Lidar Unit intervals. Interpolated from LATTICE E50-VTL using the INFO lookup table LIDAR2_LKUP. E50-VTLP ranges from 5 to a maximum value of 80 Lidar Units.
Coverage Type: Lidar
Feature Type: Polygon
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E50-VTLP

```
         ARCS                                POLYGONS

Arcs          =        920            Polygons    =        430
Segments      =      15329            Polygon Topology is present.
0    bytes of Arc Attribute Data      23   bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =        429            Tics        =          4
                                      Annotations =          0
                                      Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            6.269 N          The coverage has not been Edited
Dangle  =            0.000 N          since the last BUILD or CLEAN.

                   COVERAGE BOUNDARY

Xmin =               464376.500       Ymin =               385259.531
Xmax =               530162.188       Ymax =               447952.875
```

ITEMS 03/26/90

```
 TYPE NAME                            INTERNAL NAME    NO. RECS LENGTH EXTERNL
-------------------------------------------------------------------------------
  DF  E50-VTLP.BND                      ARC026DAT          1      16     XX
  DF  E50-VTLP.TIC                      ARC027DAT          4      12     XX
  DF  E50-VTLP.PAT                      ARC030DAT        430      23     XX

E50-VTLP.PAT
430 Records Selected.

COLUMN   ITEM NAME         WIDTH OUTPUT  TYPE N.DEC  ALTERNATE NAME     INDEXED?
    1  AREA                    4     12     F      3                       -
    5  PERIMETER               4     12     F      3                       -
    9  E50-VTLP#               4      5     B      0                       -
   13  E50-VTLP-ID             4      5     B      0                       -
   17  RANGE-CODE              4      5     B      0                       -
   21  RNGE                    3      3     I      -                       -
```

LOG 03/26/90

```
   Date     Time Elap  CPU   I/O  Command
                 min  sec   opr
 -------- ----- ---- ----  ---- ----------------
 11/ 2/88  9:33   2    51  2367 ELIMINATE E50-VTLP E50-VTLP-ELIM NOKEEPEDGE POLY
 11/ 2/88 11:49   0     4   183 RENAME E50-VTLP-ELIM E50-VTLP
  3/26/90 10:27   0     2    82 EXTERNALALL
  3/26/90   13:   4      14          127       6051            export   cover   E50-VTLP
dub1:[pearl.denver]J13-E50-VTLP.e00
```

Name of Coverage: E50-RANGE-M
Location: DISK$USER3:[DENVER.JAN13.DEV-50]
Summary: E50-RANGE-M represents Lidar intensities at 8 specific ranges coded as: 11, 22, 34, 45, 56, 67, 78 and > 78. E50-RANGE-M was dissolved from E50-VTLP based on these eight Lidar intensities.
Coverage Type: Lidar
Feature Type: Polygon
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E50-RANGE-M

```
         ARCS                                POLYGONS

Arcs          =        140            Polygons    =         87
Segments      =       7640            Polygon Topology is present.
0    bytes of Arc Attribute Data      19   bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =         86            Tics        =          4
                                      Annotations =          0
                                      Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            6.269 N          The coverage has not been Edited
Dangle  =            0.000 N          since the last BUILD or CLEAN.

                   COVERAGE BOUNDARY

Xmin =               464376.500       Ymin =               385259.531
Xmax =               530162.188       Ymax =               447952.875
```

ITEMS 03/26/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E50-RANGE-M.PAT	ARC023DAT	87	19	XX
DF	E50-RANGE-M.BND	ARC025DAT	1	16	XX
DF	E50-RANGE-M.TIC	ARC029DAT	4	12	XX

E50-RANGE-M.PAT
87 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E50-RANGE-M#	4	5	B	0		-
13	E50-RANGE-M-ID	4	5	B	0		-
17	RNGE	3	3	I	-		-

LOG 03/26/90

```
   Date     Time Elap  CPU   I/O  Command
                 min  sec   opr
 -------- ----- ---- ----  ---- ----------------
 11/ 2/88 12: 0   5    50  2095 DISSOLVE E50-VTLP E50-RANGE-M RNGE
  3/26/90 10:26   0     2    91 EXTERNALALL
  3/26/90   12:32        2          50      2803          export   cover   E50-RANGE-M
dub1:[pearl.denver]J13-E50-RANGE-M.e00
```

III. DEV-60 (Lidar surfaces generated based on 60 meters AGL).

Name of Coverage: E60_APP
Location: DUB0:[DENVER.JAN13.DEV-60]
Summary: E60_APP represents Lidar return values collected 1/13/88 at 60 meters AGL from 08:00 to 09:44. Mission data was organized by transect and was obtained from data file [denver.exe]DB3.GND. Data was generated from locational values collected at time of mission.
Coverage Type: Lidar
Feature Type: Point
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E60_APP

```
         ARCS                                POLYGONS

Arcs          =          0            Polygons    =          0
Segments      =          0            There is NO Polygon Topology.
0    bytes of Arc Attribute Data       0    bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =       3599            Tics        =          4
22   bytes of Attribute Data/Point    Annotations =          0
                                      Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            6.295 N          The coverage has not been Edited
Dangle  =            0.000 N          since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =               463284.469       Ymin =               385006.719
Xmax =               531264.125       Ymax =               447956.094
```

ITEMS 03/26/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E60_APP.PAT	ARC002DAT	3599	22	XX
DF	E60_APP.TIC	ARC022DAT	4	12	XX
DF	E60_APP.BND	ARC024DAT	1	16	XX

E60_APP.PAT
3599 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E60_APP#	4	5	B	0		-
13	E60_APP-ID	4	5	B	0		-
17	LIDAR	3	3	I	-		-
20	FLIGHT	3	3	I	-		-

LOG 03/26/90

Date	Time	Elap min	CPU sec	I/O opr	Command
11/ 1/88	19:18	2	62	1346	APPEND E60_APP POINT FEATURES
11/ 1/88	19:20	2	85	825	BUILD E60_APP POINT
3/26/90	13:57	4	118	5129	export cover E60_APP dub1:[pearl.denver]J13-E60_APP.e00

Name of Coverage: E60-TIN
Location: DUB0:[DENVER.JAN13.DEV-60]
Summary: A TIN created from E60_APP using a proximal sampling distance of 1000 meters. E60-TIN is the first surface model in a series of surface generations.
Coverage Type: Lidar
Feature Type: TIN
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

TIN DESCRIPTION FOR E60-TIN

Tin Topology

Nodes = 357 Triangles = 668
Hull nodes = 44

Surface value range

Min Z = 0.000 Max Z = 101.000

Tin Boundary

Xmin = 463284.469 Ymin = 385006.719
Xmax = 531264.125 Ymax = 447954.906

LOG 03/26/90

Date	Time	Elap min	CPU sec	I/O opr	Command
11/ 2/88	8:30	1	26	1074	ARCTIN E60_APP E60-TIN POINT LIDAR # 1000
3/26/90	10:37	0	3	173	EXTERNALALL

Name of Lattice: E60-LAT.LAT
Location: DISK$USER3:[DENVER.JAN13.DEV-60]
Summary: A LATTICE created from TIN E60-TIN. A LATTICE is a binary system file which is interpolated from TIN based on starting origin, and number of points in X/Y direction. E60-LAT.LAT was used to create the VIP coverage E60-VIP.
Coverage Type: Lidar
Feature Type: LATTICE
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

LATTICE DESCRIPTION FOR E60-LAT.LAT

Lattice size and origin

Points in X/Y = 250 250 Origin (x,y)= 463284.469 385006.719

Lattice distance between points

Distance in X = 273.011 Distance in Y = 252.804

Surface value range

Min Z = 0.000 Max Z = 77.947

Lattice boundary

Xmin = 463284.469 Ymin = 385006.719
Xmax = 531264.125 Ymax = 447954.906

Name of Coverage: E60-VIP
Location: DUB0:[DENVER.JAN13.DEV-60]
Summary: E60-VIP is a point coverage which represents, based on a 15% sample of E60-LAT.LAT, the Lidar "Z" values which were most important in describing the surface. Two attributes SPOT, representing Lidar "Z" values, and SFCODE are contained in the INFO file E80-VIP.PAT. SFCODE was a SPOT feature code, coded as one of the following:

2 for a surface maximum or convexity.
-2 for a surface minimum or concavity
1 for an inflection or transition close to a maximum
-1 an inflection or transition feature close to a minimum
0 for a point that is both a local surface maximum and a local surface surface minimum.

Coverage Type: Lidar
Feature Type: Point
Input Scale: N/A
Date Produced: 11/2/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E60-VIP

```
         ARCS                                POLYGONS

Arcs          =          0            Polygons    =          0
Segments      =          0            There is NO Polygon Topology.
0    bytes of Arc Attribute Data      0    bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =       9498            Tics        =          4
24   bytes of Attribute Data/Point    Annotations =          0
                                      Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            6.244 N          The coverage has not been Edited
Dangle  =            0.000 N          since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =               463830.500       Ymin =               385259.531
Xmax =               530172.063       Ymax =               447702.094
```

ITEMS 03/26/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E60-VIP.BND	ARC047DAT	1	16	XX
DF	E60-VIP.TIC	ARC049DAT	4	12	XX
DF	E60-VIP.PAT	ARC050DAT	9498	24	XX

E60-VIP.PAT
9498 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E60-VIP#	4	5	B	0		-
13	E60-VIP-ID	4	5	B	0		-
17	SPOT	4	12	F	3		-
21	SFCODE	4	5	B	0		-

LOG 03/26/90

Date	Time	Elap min	CPU sec	I/O opr	Command
11/ 2/88	8:36	2	58	797	VIP E60-LAT E60-VIP 15

Name of Coverage: E60-VT
Location: DISK$USER3:[DENVER.JAN13.DEV-60]
Summary: A TIN created from coverage E60-VIP using a proximal sampling distance of 1500 meters.
Coverage Type: Lidar
Feature Type: TIN
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/1/88

TIN DESCRIPTION FOR E60-VT

Tin Topology

Nodes	= 732	Triangles	= 1428
Hull nodes	= 34		

Surface value range

Min Z	= 0.000	Max Z	= 77.947

Tin Boundary

Xmin = 464376.500	Ymin = 385259.531
Xmax = 529899.063	Ymax = 447702.094

LOG 03/26/90

Date	Time	Elap min	CPU sec	I/O opr	Command
11/ 2/88	8:37	1	42	390	ARCTIN E60-VIP E60-VT POINT SPOT # 1500
3/26/90	10:37	0	3	137	EXTERNALALL
3/26/90	13:46	0	5	223	export cover E60-VT dub1:[pearl.denver]J13-E60-VT.e00

Name of Coverage: E60-VT-HULL
Location: DISK$USER3:[DENVER.JAN13.DEV-60]
Summary: A coverage representing the boundary extent of TIN E60-VT. This coverage was used to set mapextents for plotting and creating views.
Coverage Type: Lidar
Feature Type: Polygon
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E60-VT-HULL

```
         ARCS                                POLYGONS

Arcs          =          34            Polygons    =          2
Segments      =          34            Polygon Topology is present.
0    bytes of Arc Attribute Data       16   bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =          0             Tics        =          4
                                       Annotations =          0
                                       Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            6.244 N           The coverage has not been Edited
Dangle  =            0.000 N           since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =               464376.500        Ymin =               385259.531
Xmax =               529899.063        Ymax =               447702.094
```

ITEMS 03/26/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E60-VT-HULL.BND	ARC023DAT	1	16	XX
DF	E60-VT-HULL.TIC	ARC025DAT	4	12	XX
DF	E60-VT-HULL.PAT	ARC034DAT	3	16	XX

E60-VT-HULL.PAT
3 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E60-VT-HULL#	4	5	B	0		-
13	E60-VT-HULL-ID	4	5	B	0		-

LOG 03/26/90

```
   Date     Time Elap  CPU   I/O  Command
                 min  sec   opr
 -------- ----- ---- ----  ---- ----------------
 11/ 2/88 14:56   1    10   511 TINARC E60-VT E60-VT-HULL HULL
  3/26/90 10:37   0     2    82 EXTERNALALL
  3/26/90   13:45        0            8        360          export   cover   E60-VT-HULL
dub1:[pearl.denver]J13-E60-VT-HULL.e00
```

Name of Coverage: E60-VTC
Location: DUB0:[DENVER.JAN13.DEV-60]
Summary: A Lidar contour coverage at intervals of 10 Lidar Units. E60-VTC was interpolated from E60-VT. Contours range from 10 to 70 Lidar Units.
Coverage Type: Lidar
Feature Type: Line
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E60-VTC

```
         ARCS                                POLYGONS

Arcs          =        175            Polygons    =          0
Segments      =       4565            There is NO Polygon Topology.
32   bytes of Arc Attribute Data      0    bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =          0            Tics        =          4
                                      Annotations =          0
                                      Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            6.243 N          The coverage has not been Edited
Dangle  =            0.000 N          since the last BUILD or CLEAN.

                   COVERAGE BOUNDARY

Xmin =               464383.063       Ymin =               385265.781
Xmax =               529892.500       Ymax =               447695.844
```

ITEMS 03/26/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E60-VTC.BND	ARC035DAT	1	16	XX
DF	E60-VTC.TIC	ARC037DAT	4	12	XX
DF	E60-VTC.AAT	ARC038DAT	175	32	XX

E60-VTC.AAT
175 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	FNODE#	4	5	B	0		-
5	TNODE#	4	5	B	0		-
9	LPOLY#	4	5	B	0		-
13	RPOLY#	4	5	B	0		-
17	LENGTH	4	12	F	3		-
21	E60-VTC#	4	5	B	0		-
25	E60-VTC-ID	4	5	B	0		-
29	LIDAR	4	12	F	3		-

LOG 03/26/90

```
   Date     Time Elap  CPU   I/O  Command
                 min  sec   opr
 -------- ----- ---- ----  ---- ----------------
 11/ 2/88  8:41   4   193   535    TINCONTOUR E60-VT E60-VTC 10 0 LIDAR SMOOTH
  3/26/90 10:37   0     2    82 EXTERNALALL
  3/26/90 13:47   1    32  1598    export cover E60-VTC dub1:[pearl.denver]J13-E60-VTC.e00
```

Name of Lattice: E60-VTL.LAT
Location: DISK$USER3:[DENVER.JAN13.DEV-60]
Summary: A LATTICE created from TIN E60-VT. A LATTICE is a binary system file which is interpolated from TIN based on starting origin, and number of points in X/Y direction. E60-VTL.LAT was used to create polygon coverage E60-VTLP.
Coverage Type: Lidar
Feature Type: LATTICE
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

LATTICE DESCRIPTION FOR E60-VTL.LAT

Lattice size and origin

Points in X/Y = 250 250 Origin (x,y)= 464376.500 385259.531

Lattice distance between points

Distance in X = 263.143 Distance in Y = 250.773

Surface value range

Min Z = 0.000 Max Z = 70.189

Lattice boundary

Xmin = 464376.500 Ymin = 385259.531
Xmax = 529899.063 Ymax = 447702.094

Name of Coverage: E60-VTLP
Location: DISK$USER3:[DENVER.JAN13.DEV-60]
Summary: A polygon coverage representing Lidar backscatter based on 5 Lidar Unit intervals. Interpolated from LATTICE E60-VTL using the INFO lookup table LIDAR2_LKUP. E60-VTLP ranges from 5 to a maximum value of 75 Lidar Units.
Coverage Type: Lidar
Feature Type: Polygon
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E60-VTLP

```
         ARCS                                POLYGONS

Arcs          =       1074            Polygons    =        501
Segments      =      16051            Polygon Topology is present.
0    bytes of Arc Attribute Data      23   bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =        500            Tics        =          4
                                      Annotations =          0
                                      Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            6.269 N          The coverage has not been Edited
Dangle  =            0.000 N          since the last BUILD or CLEAN.

                   COVERAGE BOUNDARY

Xmin =               464376.500       Ymin =               385259.531
Xmax =               530162.188       Ymax =               447952.875
```

ITEMS 03/26/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E60-VTLP.BND	ARC029DAT	1	16	XX
DF	E60-VTLP.TIC	ARC030DAT	4	12	XX
DF	E60-VTLP.PAT	ARC033DAT	501	23	XX

E60-VTLP.PAT
501 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E60-VTLP#	4	5	B	0		-
13	E60-VTLP-ID	4	5	B	0		-
17	RANGE-CODE	4	5	B	0		-
21	RNGE	3	3	I	-		-

LOG 03/26/90

```
   Date     Time Elap  CPU   I/O  Command
                 min  sec   opr
 -------- ----- ---- ----  ---- -----------------
 11/ 2/88  9:31   3    57  2409 ELIMINATE E60-VTLP E60-VTLP-ELIM NOKEEPEDGE POLY
 11/ 2/88 14:41   0     4   183 rename e60-vtlp-elim e60-vtlp
  3/26/90 10:37   0     2   110 EXTERNALALL
  3/26/90   13:52        5          133       6557            export   cover   E60-VTLP
dub1:[pearl.denver]J13-E60-VTLP.e00
```

Name of Coverage: E60-RANGE-M
Location: DISK$USER3:[DENVER.JAN13.DEV-60]
Summary: E60-RANGE-M represents Lidar intensities at 8 specific ranges coded as: 11, 22, 34, 45, 56, 67, 78 and > 78. E60-RANGE-M was dissolved from E60-VTLP based on these eight Lidar intensities.
Coverage Type: Lidar
Feature Type: Polygon
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E60-RANGE-M

```
         ARCS                                POLYGONS

Arcs          =        181            Polygons     =        103
Segments      =       8028            Polygon Topology is present.
0    bytes of Arc Attribute Data      19   bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =        102            Tics         =          4
                                      Annotations  =          0
                                      Links        =          0
         TOLERANCES                          STATUS

Fuzzy   =            6.269 N          The coverage has not been Edited
Dangle  =            0.000 N          since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =               464376.500       Ymin =               385259.531
Xmax =               530162.188       Ymax =               447952.875
```

ITEMS 03/26/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E60-RANGE-M.PAT	ARC026DAT	103	19	XX
DF	E60-RANGE-M.BND	ARC027DAT	1	16	XX
DF	E60-RANGE-M.TIC	ARC031DAT	4	12	XX

E60-RANGE-M.PAT
103 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E60-RANGE-M#	4	5	B	0		-
13	E60-RANGE-M-ID	4	5	B	0		-
17	RNGE	3	3	I	-		-

LOG 03/26/90

```
   Date     Time Elap  CPU   I/O  Command
                 min  sec   opr
 -------- ----- ---- ----  ---- ----------------
 11/ 2/88 14:48   3    52  2150 DISSOLVE E60-VTLP E60-RANGE-M RNGE
  3/26/90 10:36   0     2    90 EXTERNALALL
  3/26/90   13:28      14          57      2990          export   cover   E60-RANGE-M
dub1:[pearl.denver]J13-E60-RANGE-M.e00
```

III. DEV-80 (Lidar surfaces generated based on 80 meters AGL).

Description of Coverage: E80_APP
Location: DISK$USER3:[DENVER.JAN13.DEV-80]
Location: DUB0:[DENVER.JAN13.DEV-60]
Summary: E80_APP represents Lidar return values collected 1/13/88 at 80 meters AGL from 08:00 to 09:44. Mission data was organized by transect and was obtained from data file [denver.exe]DB3.GND. Data was generated from locational values collected at time of mission.
Coverage Type: Lidar
Feature Type: Point
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E80_APP

```
         ARCS                                POLYGONS

Arcs          =          0            Polygons    =          0
Segments      =          0            There is NO Polygon Topology.
0    bytes of Arc Attribute Data       0    bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =       3599             Tics        =          4
22   bytes of Attribute Data/Point     Annotations =          0
                                       Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            6.295 N           The coverage has not been Edited
Dangle  =            0.000 N           since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =               463284.469        Ymin =               385006.719
Xmax =               531264.125        Ymax =               447956.094
```

ITEMS 03/27/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E80_APP.TIC	ARC020DAT	4	12	XX
DF	E80_APP.BND	ARC024DAT	1	16	XX
DF	E80_APP.PAT	ARC053DAT	3599	22	XX

E80_APP.PAT
3599 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E80_APP#	4	5	B	0		-
13	E80_APP-ID	4	5	B	0		-
17	LIDAR	3	3	I	-		-
20	FLIGHT	3	3	I	-		-

LOG 03/27/90

```
   Date     Time Elap  CPU   I/O  Command
                 min  sec   opr
 -------- ----- ---- ----  ---- ----------------
 11/ 1/88 19:54   2    62  1339 APPEND E80_APP POINT FEATURES
 11/ 1/88 19:56   2    84   824 BUILD E80_APP POINT
  3/26/90 14:23   4   117  5133 export cover E80_APP dub1:[pearl.denver]J13-E80_APP.e00
```

Description of Coverage: E80-TIN
Location: DISK$USER3:[DENVER.JAN13.DEV-80]
Summary: A TIN created from E80_APP using a proximal sampling distance of 1000 meters. E80-TIN is the first surface model in a series of surface generations for 80 meters AGL.
Coverage Type: Lidar
Feature Type: TIN
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

TIN DESCRIPTION FOR E80-TIN

Tin Topology

Nodes	= 357	Triangles	= 668
Hull nodes	= 44		

Surface value range

Min Z	= 0.000	Max Z	= 85.000

Tin Boundary

Xmin = 463284.469	Ymin = 385006.719
Xmax = 531264.125	Ymax = 447954.906

LOG 03/27/90

Date	Time	Elap min	CPU sec	I/O opr	Command
11/ 2/88	8:46	1	27	1083	ARCTIN E80_APP E80-TIN POINT LIDAR # 1000
3/26/90	10:41	0	2	136	EXTERNALALL

Name of Lattice: E80-LAT.LAT
Location: DISK$USER3:[DENVER.JAN13.DEV-80]
Summary: A LATTICE created from TIN E80-TIN. A LATTICE is a binary system file which is interpolated from TIN based on starting origin, and number of points in X/Y direction. E80-LAT.LAT was used to create the VIP coverage E80-VIP.
Coverage Type: Lidar
Feature Type: LATTICE
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

LATTICE DESCRIPTION FOR E80-LAT.LAT

Lattice description for E80-LAT.LAT

Lattice size and origin

Points in X/Y = 250 250 Origin (x,y)= 463284.469 385006.719

Lattice distance between points

Distance in X = 273.011 Distance in Y = 252.804

Surface value range

Min Z = 0.000 Max Z = 85.000

Lattice boundary

Xmin = 463284.469 Ymin = 385006.719
Xmax = 531264.125 Ymax = 447954.906

Description of Coverage: E80-VIP
Location: DISK$USER3:[DENVER.JAN13.DEV-80]
Summary: E80-VIP is a point coverage which represents, based on a 15% sample of E80-LAT.LAT, the Lidar "Z" values which were most important in describing the surface. Two attributes SPOT, representing Lidar "Z" values, and SFCODE are contained in the INFO file E80-VIP.PAT. SFCODE was a SPOT feature code, coded as one of the following:

2 for a surface maximum or convexity.
-2 for a surface minimum or concavity
1 for an inflection or transition close to a maximum
-1 an inflection or transition feature close to a minimum
0 for a point that is both a local surface maximum and a local surface surface minimum.

Coverage Type: Lidar
Feature Type: Point
Input Scale: N/A
Date Produced: 11/2/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E60-VIP

```
         ARCS                                POLYGONS

Arcs          =          0            Polygons    =          0
Segments      =          0            There is NO Polygon Topology.
0    bytes of Arc Attribute Data      0    bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =       9864            Tics        =          4
24   bytes of Attribute Data/Point    Annotations =          0
                                      Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            6.244 N          The coverage has not been Edited
Dangle  =            0.000 N          since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =               464376.500       Ymin =               385259.531
Xmax =               529626.063       Ymax =               447702.094
```

ITEMS 03/27/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E80-VIP.BND	ARC043DAT	1	16	XX
DF	E80-VIP.TIC	ARC045DAT	4	12	XX
DF	E80-VIP.PAT	ARC052DAT	9864	24	XX

E80-VIP.PAT
9864 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E80-VIP#	4	5	B	0		-
13	E80-VIP-ID	4	5	B	0		-
17	SPOT	4	12	F	3		-
21	SFCODE	4	5	B	0		-

LOG 03/27/90

Date	Time	Elap min	CPU sec	I/O opr	Command
11/ 2/88	8:51	2	60	817	VIP E80-LAT E80-VIP 15
3/26/90	14:11	13	338	14461	export cover E80-VIP dub1:[pearl.denver]J13-E80-VIP.e00

Description of Coverage: E80-VT
Location: DISK$USER3:[DENVER.JAN13.DEV-80]
Summary: A TIN created from coverage E80-VIP using a proximal sampling distance of 1500 meters.
Coverage Type: Lidar
Feature Type: TIN
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/1/88

TIN DESCRIPTION FOR E60-VT

Tin Topology

Nodes	= 735	Triangles	= 1434
Hull nodes	= 34		

Surface value range

Min Z	= 0.000	Max Z	= 85.000

Tin Boundary

Xmin = 464376.500	Ymin = 385259.531
Xmax = 529353.063	Ymax = 447702.094

LOG 03/27/90

Date	Time	Elap min	CPU sec	I/O opr	Command
11/ 2/88	8:52	1	42	390	ARCTIN E80-VIP E80-VT POINT SPOT # 1500
3/26/90	10:41	0	2	121	EXTERNALALL
3/26/90	14:12	0	6	226	export cover E80-VT dub1:[pearl.denver]J13-E80-VT.e00

Description of Coverage: E80-VT-HULL
Location: DISK$USER3:[DENVER.JAN13.DEV-80]
Summary: A coverage representing the boundary extent of TIN E80-VT. This coverage was used to set mapextents for plotting and creating views.
Coverage Type: Lidar
Feature Type: Polygon
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E60-VT-HULL

```
         ARCS                                POLYGONS

Arcs          =          34            Polygons    =          2
Segments      =          34            Polygon Topology is present.
0    bytes of Arc Attribute Data       16   bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =           0            Tics        =          4
                                       Annotations =          0
                                       Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =             6.244 N          The coverage has not been Edited
Dangle  =             0.000 N          since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =                464376.500       Ymin =                385259.531
Xmax =                529353.063       Ymax =                447702.094
```

ITEMS 03/27/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E80-VT-HULL.BND	ARC022DAT	1	16	XX
DF	E80-VT-HULL.TIC	ARC023DAT	4	12	XX
DF	E80-VT-HULL.PAT	ARC038DAT	3	16	XX

E80-VT-HULL.PAT
3 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E80-VT-HULL#	4	5	B	0		-
13	E80-VT-HULL-ID	4	5	B	0		-

LOG 03/27/90

```
   Date     Time Elap  CPU   I/O  Command
                 min  sec   opr
 -------- ----- ---- ----  ---- ----------------
 11/ 3/88 10: 9   0     9   508 TINARC E80-VT E80-VT-HULL HULL
  3/26/90 10:41   0     2    82 EXTERNALALL
  3/26/90 14:12   0     8   360 export cover E80-VT-HULL
 dub1:[pearl.denver]J13-E80-VT-HULL.e00
```

Description of Coverage: E80-VTC
Location: DISK$USER3:[DENVER.JAN13.DEV-80]
Summary: A Lidar contour coverage at intervals of 10 Lidar Units. E80-VTC was interpolated from E80-VT. Contours range from 10 to 80 Lidar Units.
Coverage Type: Lidar
Feature Type: Line
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E80-VTC

```
         ARCS                                POLYGONS

Arcs          =        168            Polygons    =          0
Segments      =       4538            There is NO Polygon Topology.
32   bytes of Arc Attribute Data      0    bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =          0            Tics        =          4
                                      Annotations =          0
                                      Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =             6.243 N         The coverage has not been Edited
Dangle  =             0.000 N         since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =                464383.000      Ymin =                385265.781
Xmax =                529346.563      Ymax =                447695.844
```

ITEMS 03/27/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E80-VTC.BND	ARC029DAT	1	16	XX
DF	E80-VTC.TIC	ARC030DAT	4	12	XX
DF	E80-VTC.AAT	ARC042DAT	168	32	XX

E80-VTC.AAT
168 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	FNODE#	4	5	B	0		-
5	TNODE#	4	5	B	0		-
9	LPOLY#	4	5	B	0		-
13	RPOLY#	4	5	B	0		-
17	LENGTH	4	12	F	3		-
21	E80-VTC#	4	5	B	0		-
25	E80-VTC-ID	4	5	B	0		-
29	LIDAR	4	12	F	3		-

LOG 03/27/90

Date	Time	Elap min	CPU sec	I/O opr	Command
11/ 2/88	8:56	4	195	531	TINCONTOUR E80-VT E80-VTC 10 0 LIDAR SMOOTH
3/26/90	10:41	0	2	82	EXTERNALALL
3/26/90	14:14	2	34	1581	export cover E80-VTC dub1:[pearl.denver]J13-E80-VTC.e00

Name of Lattice: E80-VTL.LAT
Location: DISK$USER3:[DENVER.JAN13.DEV-80]
Summary: A LATTICE created from TIN E80-VT. A LATTICE is a binary system file which is interpolated from TIN based on starting origin, and number of points in X/Y direction. E80-VTL.LAT was used to create polygon coverage E80-VTLP.
Coverage Type: Lidar
Feature Type: LATTICE
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

LATTICE DESCRIPTION FOR E80-VTL.LAT

Lattice size and origin

Points in X/Y = 250 250 Origin (x,y)= 464376.500 385259.531

Lattice distance between points

Distance in X = 260.950 Distance in Y = 250.773

Surface value range

Min Z = 0.000 Max Z = 81.621

Lattice boundary

Xmin = 464376.500 Ymin = 385259.531
Xmax = 529353.063 Ymax = 447702.094

Description of Coverage: E80-VTLP
Location: DISK$USER3:[DENVER.JAN13.DEV-80]
Summary: A polygon coverage representing Lidar backscatter based on 5 Lidar Unit intervals. Interpolated from LATTICE E80-VTL using the INFO lookup table LIDAR2_LKUP. E80-VTLP ranges from 5 to a maximum value of 85 Lidar Units.
Coverage Type: Lidar
Feature Type: Polygon
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E80-VTLP

```
         ARCS                                POLYGONS

Arcs          =       1045            Polygons    =        488
Segments      =      15610            Polygon Topology is present.
0    bytes of Arc Attribute Data      23   bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =        487            Tics        =          4
                                      Annotations =          0
                                      Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            6.269 N          The coverage has not been Edited
Dangle  =            0.000 N          since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =               464637.438       Ymin =               385259.531
Xmax =               529614.000       Ymax =               447952.875
```

ITEMS 03/27/90

```
 TYPE NAME                            INTERNAL NAME    NO. RECS LENGTH EXTERNL
-------------------------------------------------------------------------------
  DF  E80-VTLP.BND                      ARC027DAT          1      16     XX
  DF  E80-VTLP.TIC                      ARC031DAT          4      12     XX
  DF  E80-VTLP.PAT                      ARC037DAT        488      23     XX

E80-VTLP.PAT
488 Records Selected.

COLUMN   ITEM NAME         WIDTH OUTPUT  TYPE N.DEC  ALTERNATE NAME     INDEXED?
    1  AREA                    4     12     F      3                        -
    5  PERIMETER               4     12     F      3                        -
    9  E80-VTLP#               4      5     B      0                        -
   13  E80-VTLP-ID             4      5     B      0                        -
   17  RANGE-CODE              4      5     B      0                        -
   21  RNGE                    3      3     I      -                        -
```

LOG 03/27/90

```
   Date     Time Elap  CPU   I/O  Command
                 min  sec   opr
 -------- ----- ---- ----  ---- ----------------
 11/ 3/88  9:23   2    56  2352 ELIMINATE E80-VTLP E80-VTLP-ELIM NOKEEPEDGE POLY
 11/ 3/88 10: 1   0     4   175 RENAME E80-VTLP-ELIM E80-VTLP
  3/26/90 10:41   0     2   104 EXTERNALALL
  3/26/90 14:19   6   131  6368 export cover E80-VTLP dubl:[pearl.denver]J13-E80-VTLP.e00
```

Description of Coverage: E80-RANGE-M
Location: DISK$USER3:[DENVER.JAN13.DEV-80]
Summary: E80-RANGE-M represents Lidar intensities at 8 specific ranges coded as: 11, 22, 34, 45, 56, 67, 78 and > 78. E80-RANGE-M was dissolved from E80-VTLP based on these eight Lidar intensities.
Coverage Type: Lidar
Feature Type: Polygon
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E80-RANGE-M

```
         ARCS                                POLYGONS

Arcs          =         82            Polygons    =         63
Segments      =       7472            Polygon Topology is present.
0    bytes of Arc Attribute Data      19   bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =         62            Tics        =          4
                                      Annotations =          0
                                      Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =             6.269 N         The coverage has not been Edited
Dangle  =             0.000 N         since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =                464637.438      Ymin =                385259.531
Xmax =                529614.000      Ymax =                447952.875
```

ITEMS 03/27/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E80-RANGE-M.PAT	ARC025DAT	63	19	XX
DF	E80-RANGE-M.BND	ARC026DAT	1	16	XX
DF	E80-RANGE-M.TIC	ARC033DAT	4	12	XX

E80-RANGE-M.PAT
63 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E80-RANGE-M#	4	5	B	0		-
13	E80-RANGE-M-ID	4	5	B	0		-
17	RNGE	3	3	I	-		-

LOG 03/27/90

```
   Date     Time Elap  CPU   I/O  Command
                 min  sec   opr
 -------- ----- ---- ----  ---- ----------------
 11/ 3/88 10: 8   3    50  2129 DISSOLVE E80-VTLP E80-RANGE-M RNGE
  3/26/90 10:40   0     2    91 EXTERNALALL
  3/26/90 13:59   2    47  2627 export cover E80-RANGE-M
                                dub1:[pearl.denver]J13-E80-RANGE-M.e00
```

V. FLT - (Transect Mission Flight Lines)

Description of Coverage: FLIGHT_DBC-U
Location: DUB0:[DENVER.JAN13.FLT]
Summary: Transect flight lines which were used in the interpolation of Lidar surfaces for the January 13, 1988 mission. Mission coordinates were used to generate the flight lines.
Coverage Type: Lidar
Feature Type: Lines
Average RMS error: N/A
Input Scale: N/A
Date Produced: 3/28/90

DESCRIPTION OF SINGLE PRECISION COVERAGE FLIGHT_DBC-U

ARCS

Arcs = 11
Segments = 4032
49 bytes of Arc Attribute Data

POLYGONS

Polygons = 0
There is NO Polygon Topology.
0 bytes of Polygon Attribute Data

POINTS

Label Points = 0

SECONDARY FEATURES

Tics = 4
Annotations = 38
Links = 0

TOLERANCES

Fuzzy = 7.035 N
Dangle = 0.000 N

STATUS

The coverage has not been Edited since the last BUILD or CLEAN.

COVERAGE BOUNDARY

Xmin = 463284.469
Xmax = 531264.125
Ymin = 385006.719
Ymax = 447956.094

ITEMS 03/29/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	FLIGHT_DBC-U.AAT	ARC013DAT	11	49	XX
DF	FLIGHT_DBC-U.BND	ARC016DAT	1	16	XX
DF	FLIGHT_DBC-U.TIC	ARC017DAT	4	12	XX

FLIGHT_DBC-U.AAT
11 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	FNODE#	4	5	B	0		-
5	TNODE#	4	5	B	0		-
9	LPOLY#	4	5	B	0		-
13	RPOLY#	4	5	B	0		-
17	LENGTH	4	12	F	3		-
21	FLIGHT_DBC-U#	4	5	B	0		-
25	FLIGHT_DBC-U-ID	4	5	B	0		-
29	FLT	3	3	I	-		-
32	FLIGHT	3	3	I	-		-
35	TAPE	5	5	C	-		-
40	START.TIME	5	5	N	2		-
45	END.TIME	5	5	N	2		-

FLIGHT_DBC-U Continued...

LOG 03/29/90

```
   Date     Time Elap  CPU   I/O  Command
                  min  sec   opr
 -------- ----- ---- ----  ---- -----------------
  3/28/90 11:10   2    36  1649 RESELECT FLIGHT_UTM FLIGHT_DBC-U LINE
  3/28/90  11:21     1      29   1748  EXPORT  COVER  DUB0:[DENVER.JAN13.FLT]FLIGHT_DBC-U
J13-FLIGHT_DBC-U.E00
```

Description of Coverage: FLIGHT_UTM
Location: DUB0:[DENVER.JAN13.FLT]
Summary: January 13, 1988 mission transect flight lines. Coordinates taken at time of mission were used to generate this coverage.
Coverage Type: Lidar
Feature Type: Line
Average RMS error: N/A
Input Scale: N/A
Date Produced: 7/21/88

DESCRIPTION OF SINGLE PRECISION COVERAGE FLIGHT_UTM

ARCS		POLYGONS	
Arcs =	17	Polygons =	0
Segments =	5823	There is NO Polygon Topology.	
49 bytes of Arc Attribute Data		0 bytes of Polygon Attribute Data	

POINTS		SECONDARY FEATURES	
Label Points =	0	Tics =	4
		Annotations =	38
		Links =	0

TOLERANCES		STATUS
Fuzzy =	7.035 N	The coverage has not been Edited
Dangle =	0.000 N	since the last BUILD or CLEAN.

COVERAGE BOUNDARY

Xmin =	463284.469	Ymin =	377606.469
Xmax =	531264.125	Ymax =	447956.094

ITEMS 03/28/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	FLIGHT_UTM.AAT	ARC009DAT	17	49	XX
DF	FLIGHT_UTM.TIC	ARC012DAT	4	12	XX
DF	FLIGHT_UTM.BND	ARC014DAT	1	16	XX

FLIGHT_UTM.AAT
17 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	FNODE#	4	5	B	0		-
5	TNODE#	4	5	B	0		-
9	LPOLY#	4	5	B	0		-
13	RPOLY#	4	5	B	0		-
17	LENGTH	4	12	F	3		-
21	FLIGHT_UTM#	4	5	B	0		-
25	FLIGHT_UTM-ID	4	5	B	0		-
29	FLT	3	3	I	-		-
32	FLIGHT	3	3	I	-		-
35	TAPE	5	5	C	-		-
40	START.TIME	5	5	N	2		-
45	END.TIME	5	5	N	2		-

FLIGHT_UTM Continued...

LOG 03/28/90

```
   Date     Time Elap  CPU   I/O  Command
                 min  sec   opr
-------- ----- ---- ----  ---- ----------------
  7/20/88 16:33   2    84   484 GENERATE FLT-DB3_DD
  7/20/88 16:35   1    11  1042 BUILD FLT-DB3_DD LINE
  7/21/88 11: 5   1    19  1549 PROJECT COVER FLT-DB3_DD FLT-DB3_UTM
  7/21/88 11: 6   0     9   584 BUILD FLT-DB3_UTM LINE
  7/21/88 11: 8   1    12   696 BUILD FLT-DB3_UTM LINE
 10/31/88 14:17   0     3   165 RENAME FLT-DB3_UTM FLIGHT_UTM
  3/26/90 10:48   0     1    92 EXTERNALALL
  3/26/90   14:25        2           39      2159           export   cover   FLIGHT_UTM
dub1:[pearl.denver]J13-FLIGHT_UTM.e00
```

JAN20 (January 20, 1988 Lidar Collection Mission)

Listings for January 20, 1988 are organized by directories DEV-30, DEV-50, DEV-60, DEV-80 and FLT.

I. DEV-30 (Lidar surfaces generated based on 30 meters AGL).

Description of Coverage: E30_APP
Location: DUB0:[DENVER.JAN20.DEV-30]
Summary: E30_APP represents Lidar return values collected 1/20/88 at 30 meters AGL from 11:45 to 02:30 PM. Mission data was organized by transect and was obtained from data file [denver.exe]DB3.GND. Data was generated from locational values collected at time of mission.
Coverage Type: Lidar
Feature Type: Point
Input Scale: N/A
Digitized by: N/A
Date Produced: 11/1/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E30_APP

```
         ARCS                                POLYGONS

Arcs          =          0            Polygons    =          0
Segments      =          0            There is NO Polygon Topology.
0    bytes of Arc Attribute Data       0    bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =       3923             Tics        =          4
37   bytes of Attribute Data/Point     Annotations =          0
                                       Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            5.348 N           The coverage has not been Edited
Dangle  =            0.000 N           since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =               469049.438        Ymin =               395002.500
Xmax =               534380.188        Ymax =               448487.000
```

ITEMS 03/27/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E30_APP.PAT	ARC051DAT	3923	37	XX
DF	E30_APP.BND	ARC052DAT	1	16	XX
DF	E30_APP.TIC	ARC053DAT	4	12	XX

E30_APP Continued...

E30_APP.PAT
3923 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E30_APP#	4	5	B	0		-
13	E30_APP-ID	4	5	B	0		-
17	LIDAR	3	3	I	-		-
20	FLIGHT	3	3	I	-		-
23	TAPE	5	5	C	-		-
28	START.TIME	5	5	N	2		-
33	END.TIME	5	5	N	2		-

LOG 03/27/90

Date	Time	Elap min	CPU sec	I/O opr	Command
7/20/88	10:55	0	4	224	CREATE E30_APP-UTM
7/20/88	11:32	0	5	196	RENAME E30_APP-UTM E30_APP
3/26/90	11: 3	0	2	96	EXTERNALALL
3/26/90	15:34	7	167	6889	export cover E30_APP dub1:[pearl.denver]J20-E30_APP.e00

Description of Coverage: E30-TIN
Location: DUB0:[DENVER.JAN20.DEV-30]
Summary: A TIN created from E30_APP using a proximal sampling distance of 1000 meters. E30-TIN is the first surface model in a series of surface generations.
Coverage Type: Lidar
Feature Type: TIN
Average RMS error: N/A
Input Scale: N/A
Date Produced: 7/20/88

TIN DESCRIPTION FOR E30-TIN

Tin Topology

Nodes	= 166	Triangles	= 319
Hull nodes	= 11		

Surface value range

Min Z	= 0.000	Max Z	= 252.000

Tin Boundary

Xmin = 469049.438	Ymin = 395002.500
Xmax = 534380.188	Ymax = 448487.000

LOG 03/27/90

Date	Time	Elap min	CPU sec	I/O opr	Command
7/20/88	17:43	1	26	1082	ARCTIN E30_APP E30-TIN POINT LIDAR # 2250.0
3/26/90	11: 2	0	3	128	EXTERNALALL

Name of Lattice: E30-LAT.LAT
Location: DISK$USER3:[DENVER.JAN20.DEV-30]
Summary: A LATTICE created from TIN E30-TIN. A LATTICE is a binary system file which is interpolated from TIN based on starting origin, and number of points in X/Y direction. E30-LAT.LAT was used to create the VIP coverage E30-VIP.
Coverage Type: Lidar
Feature Type: LATTICE
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

LATTICE DESCRIPTION FOR E30-LAT.LAT

Lattice size and origin

Points in X/Y = 250 250 Origin (x,y)= 469049.438 395002.500

Lattice distance between points

Distance in X = 262.372 Distance in Y = 214.797

Surface value range

Min Z = 0.000 Max Z = 252.000

Lattice boundary

Xmin = 469049.438 Ymin = 395002.500
Xmax = 534380.188 Ymax = 448487.000

Description of Coverage: E30-VIP
Location: DUB0:[DENVER.JAN20.DEV-30]
Summary: E30-VIP is a point coverage which represents, based on a 10% sample of E30-LAT.LAT, the Lidar "Z" values which were most important in describing the surface. Two attributes SPOT, representing Lidar "Z" values, and SFCODE are contained in the INFO file E30-VIP.PAT. SFCODE was a SPOT feature code, coded as one of the following:

2 for a surface maximum or convexity.
-2 for a surface minimum or concavity
1 for an inflection or transition close to a maximum
-1 an inflection or transition feature close to a minimum
0 for a point that is both a local surface maximum and a local surface surface minimum.

Coverage Type: Lidar
Feature Type: Point
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/1/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E30-VIP

```
         ARCS                                POLYGONS

Arcs          =          0            Polygons    =          0
Segments      =          0            There is NO Polygon Topology.
0    bytes of Arc Attribute Data       0    bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =       6809            Tics        =          4
24   bytes of Attribute Data/Point    Annotations =          0
                                      Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            5.305 N          The coverage has not been Edited
Dangle  =            0.000 N          since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =               472197.906       Ymin =               395217.313
Xmax =               532018.813       Ymax =               448272.219
```

ITEMS 03/27/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E30-VIP.BND	ARC062DAT	1	16	XX
DF	E30-VIP.TIC	ARC063DAT	4	12	XX
DF	E30-VIP.PAT	ARC064DAT	6809	24	XX

E30-VIP.PAT
6809 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E30-VIP#	4	5	B	0		-
13	E30-VIP-ID	4	5	B	0		-
17	SPOT	4	12	F	3		-
21	SFCODE	4	5	B	0		-

E30-VIP Continued...

LOG 03/27/90

```
   Date     Time Elap  CPU   I/O  Command
                  min  sec   opr
-------- ----- ---- ----  ---- -----------------
 7/20/88 17:46   1    49   768    VIP E30-LAT E30-VIP 10
 3/26/90 11: 2   0     3    98 EXTERNALALL
 3/26/90 14:52  13   242 10093   export cover E30-VIP dub1:[pearl.denver]J20-E30-VIP.e00
```

Description of Coverage: E30-VT
Location: DUB0:[DENVER.JAN20.DEV-30]
Summary: A TIN created from coverage E30-VIP using a proximal sampling distance of 1500 meters.
Coverage Type: Lidar
Feature Type: TIN
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/1/88

TIN DESCRIPTION FOR E30-VT

Tin Topology

Nodes	= 270	Triangles	= 518
Hull nodes	= 20		

Surface value range

Min Z	= 0.000	Max Z	= 252.000

Tin Boundary

Xmin = 472985.031	Ymin = 395217.313
Xmax = 531494.125	Ymax = 448272.219

LOG 03/27/90

Date	Time	Elap min	CPU sec	I/O opr	Command
7/20/88	17:46	1	30	360	ARCTIN E30-VIP E30-VT POINT SPOT # 2250.0
3/26/90	11: 2	0	3	127	EXTERNALALL
3/26/90	14:53	1	6	227	export cover E30-VT dub1:[pearl.denver]J20-E30-VT.e00

Description of Coverage: E30-VT-HULL
Location: DUB0:[DENVER.JAN20.DEV-30]
Summary: A coverage representing the boundary extent of TIN E30-VT. This coverage was used to set mapextents for plotting and creating views.
Coverage Type: Lidar
Feature Type: Polygon
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/1/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E30-VT-HULL

```
         ARCS                                POLYGONS

Arcs          =          20            Polygons    =          2
Segments      =          20            Polygon Topology is present.
0    bytes of Arc Attribute Data       16   bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =           0            Tics        =          4
                                       Annotations =          0
                                       Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =             5.305 N          The coverage has not been Edited
Dangle  =             0.000 N          since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =                472985.031       Ymin =                395217.313
Xmax =                531494.125       Ymax =                448272.219
```

ITEMS 03/27/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E30-VT-HULL.BND	ARC041DAT	1	16	XX
DF	E30-VT-HULL.TIC	ARC042DAT	4	12	XX
DF	E30-VT-HULL.PAT	ARC043DAT	3	16	XX

E30-VT-HULL.PAT
3 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E30-VT-HULL#	4	5	B	0		-
13	E30-VT-HULL-ID	4	5	B	0		-

LOG 03/27/90

```
   Date     Time Elap  CPU   I/O  Command
                 min  sec   opr
 -------- ----- ---- ----  ---- ----------------
  8/29/88 10: 6   1     9   523 TINARC E30-VT E30-VT-HULL HULL
  3/26/90 11: 2   0     2    91 EXTERNALALL
  3/26/90 14:52   1     8   342 export cover E30-VT-HULL
 dub1:[pearl.denver]J20-E30-VT-HULL.e00
```

Description of Coverage: E30-VTC
Location: DUB0:[DENVER.JAN20.DEV-30]
Summary: A Lidar contour coverage at intervals of 10 Lidar Units. E30-VTC was interpolated from E30-VT. Contours range from 10 to 250 Lidar Units.
Coverage Type: Lidar
Feature Type: Line
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/1/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E30-VTC

```
         ARCS                                POLYGONS

Arcs          =        286            Polygons    =          0
Segments      =      12838            There is NO Polygon Topology.
32   bytes of Arc Attribute Data      0    bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =          0            Tics        =          4
                                      Annotations =          0
                                      Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            5.304 N          The coverage has not been Edited
Dangle  =            0.000 N          since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =               472990.875       Ymin =               395222.625
Xmax =               531488.250       Ymax =               448266.906
```

ITEMS 03/27/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E30-VTC.BND	ARC059DAT	1	16	XX
DF	E30-VTC.TIC	ARC060DAT	4	12	XX
DF	E30-VTC.AAT	ARC061DAT	286	32	XX

E30-VTC.AAT
286 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	FNODE#	4	5	B	0		-
5	TNODE#	4	5	B	0		-
9	LPOLY#	4	5	B	0		-
13	RPOLY#	4	5	B	0		-
17	LENGTH	4	12	F	3		-
21	E30-VTC#	4	5	B	0		-
25	E30-VTC-ID	4	5	B	0		-
29	LIDAR	4	12	F	3		-

LOG 03/27/90

Date	Time	Elap min	CPU sec	I/O opr	Command
7/20/88	17:52	6	320	550	TINCONTOUR E30-VT E30-VTC 10 0 LIDAR SMOOTH
3/26/90	11: 3	0	2	97	EXTERNALALL
3/26/90	14:57	4	77	3680	export cover E30-VTC dub1:[pearl.denver]J20-E30-VTC.e00

Name of Lattice: E30-VTL.LAT
Location: DISK$USER3:[DENVER.JAN20.DEV-30]
Summary: A LATTICE created from TIN E30-VT. A LATTICE is a binary system file which is interpolated from TIN based on starting origin, and number of points in X/Y direction. E30-VTL.LAT was used to create polygon coverage E30-VTLP.
Coverage Type: Lidar
Feature Type: LATTICE
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

LATTICE DESCRIPTION FOR E30-VTL.LAT

Lattice size and origin

Points in X/Y = 250 250 Origin (x,y)= 472985.031 395217.313

Lattice distance between points

Distance in X = 234.976 Distance in Y = 213.072

Surface value range

Min Z = 0.000 Max Z = 252.000

Lattice boundary

Xmin = 472985.031 Ymin = 395217.313
Xmax = 531494.125 Ymax = 448272.219

Description of Coverage: E30-VTLP
Location: DUB0:[DENVER.JAN20.DEV-30]
Summary: A polygon coverage representing Lidar backscatter based on 5 Lidar Unit intervals. Interpolated from LATTICE E30-VTL using the INFO lookup table LIDAR2_LKUP. Lidar ranges from 5 to a maximum value of 260.
Coverage Type: Lidar
Feature Type: Polygon
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/1/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E30-VTLP

```
         ARCS                                POLYGONS

Arcs          =      12961            Polygons     =       5803
Segments      =      43845            Polygon Topology is present.
0    bytes of Arc Attribute Data       23   bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =       5802            Tics         =          4
                                      Annotations  =          0
                                      Links        =          0
         TOLERANCES                          STATUS

Fuzzy   =            5.327 N          The coverage has not been Edited
Dangle  =            0.000 N          since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =               472985.031       Ymin =                395217.313
Xmax =               531729.125       Ymax =                448485.281
```

ITEMS 03/27/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E30-VTLP.BND	ARC056DAT	1	16	XX
DF	E30-VTLP.TIC	ARC057DAT	4	12	XX
DF	E30-VTLP.PAT	ARC058DAT	5803	23	XX

E30-VTLP.PAT
5803 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E30-VTLP#	4	5	B	0		-
13	E30-VTLP-ID	4	5	B	0		-
17	RANGE-CODE	4	5	B	0		-
21	RNGE	3	3	I	-		-

LOG 03/27/90

```
   Date     Time Elap  CPU   I/O  Command
                 min  sec   opr
 -------- ----- ---- ----  ---- ----------------
  7/20/88 18:59  66   631 59026 LATTICEPOLY E30-VTL E30-VTLP RANGE LIDAR2_LKUP
  3/26/90 11: 3   0     2    96 EXTERNALALL
  3/26/90 15:27  30   804 42395 export cover E30-VTLP dub1:[pearl.denver]J20-E30-VTLP.e00
```

Description of Coverage: E30-RANGE
Location: DUB0:[DENVER.JAN20.DEV-30]
Summary: E30-RANGE represents Lidar intensities at 9 specific ranges coded as: 30, 60, 95, 125, 160, 190, 225, 250 and > 250. E30-RANGE was dissolved from E30-VTLP based on these nine Lidar intensities.
Coverage Type: Lidar
Feature Type: Polygon
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E30-RANGE

```
         ARCS                                POLYGONS

Arcs          =        122            Polygons    =        66
Segments      =       8076            Polygon Topology is present.
0    bytes of Arc Attribute Data      19   bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =         66            Tics        =         4
                                      Annotations =         0
                                      Links       =         0
         TOLERANCES                          STATUS

Fuzzy   =             5.305 N         The coverage has not been Edited
Dangle  =             0.000 N         since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =                473220.000      Ymin =                395430.375
Xmax =                531494.125      Ymax =                448485.281
```

ITEMS 03/27/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E30-RANGE.PAT	ARC049DAT	66	19	XX
DF	E30-RANGE.BND	ARC050DAT	1	16	XX
DF	E30-RANGE.TIC	ARC054DAT	4	12	XX

E30-RANGE.PAT
66 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E30-RANGE#	4	5	B	0		-
13	E30-RANGE-ID	4	5	B	0		-
17	RNGE	3	3	I	-		-

LOG 03/27/90

```
   Date     Time Elap  CPU   I/O  Command
                 min  sec   opr
 -------- ----- ---- ----  ---- ----------------
  8/24/88 16:51  66   372 59185 DISSOLVE E30-VTLP E30-RANGE RNGE
  3/26/90 11: 2   0     2    96 EXTERNALALL
  3/26/90 14:38   3    52  2496 export cover E30-RANGE
dub1:[pearl.denver]J20-E30-RANGE.e00
```

Description of Coverage: E30-DEMOTIN
Location: DUB0:[DENVER.JAN20.DEV-30]
Summary: A coverage which represents the TIN structure of E30-VT. The DBC demo uses this coverage for display purposes.
Coverage Type: Lidar
Feature Type: Line
Average RMS error: N/A
Input Scale: N/A
Date Produced: 10/27/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E30-DEMOTIN

```
         ARCS                                POLYGONS

Arcs          =        787            Polygons    =          0
Segments      =        787            There is NO Polygon Topology.
56   bytes of Arc Attribute Data      0    bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =          0            Tics        =          4
                                      Annotations =          0
                                      Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            5.305 N          The coverage has not been Edited
Dangle  =            0.000 N          since the last BUILD or CLEAN.

                   COVERAGE BOUNDARY

Xmin =               472985.031       Ymin =               395217.313
Xmax =               531494.125       Ymax =               448272.219
```

ITEMS 03/27/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E30-DEMOTIN.BND	ARC035DAT	1	16	XX
DF	E30-DEMOTIN.TIC	ARC036DAT	4	12	XX
DF	E30-DEMOTIN.AAT	ARC038DAT	787	56	XX

E30-DEMOTIN.AAT
787 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	FNODE#	4	5	B	0		-
5	TNODE#	4	5	B	0		-
9	LPOLY#	4	5	B	0		-
13	RPOLY#	4	5	B	0		-
17	LENGTH	4	12	F	3		-
21	E30-DEMOTIN#	4	5	B	0		-
25	E30-DEMOTIN-ID	4	5	B	0		-
29	PERCENT_SLOPE	4	12	F	3		-
33	LSLOPE	4	12	F	3		-
37	RSLOPE	4	12	F	3		-
41	LASPECT	4	12	F	3		-
45	RASPECT	4	12	F	3		-
49	ZFROM	4	12	F	3		-
53	ZTO	4	12	F	3		-

LOG 03/27/90

```
   Date     Time Elap  CPU   I/O  Command
                 min  sec   opr
```

```
-------- ----- ---- ----  ---- -----------------
10/26/88 17:20   1    16  1392 TINARC E30-VT E30-SHOWTIN LINE PERCENT
```

II. DEV-50 (Lidar surfaces generated based on 50 meters AGL).

Description of Coverage: E50_APP
Location: DISK$USER3:[DENVER.JAN20.DEV-50]
Summary: E50_APP represents Lidar return values collected 1/20/88 at 50 meters AGL from 11:45 to 02:30 PM. Mission data was organized by transect and was obtained from data file [denver.exe]DB3.GND. Data was generated from locational values collected at time of mission.
Coverage Type: Lidar
Feature Type: Point
Input Scale: N/A
Digitized by: N/A
Date Produced: 11/1/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E50_APP

```
         ARCS                                POLYGONS

Arcs          =          0            Polygons    =          0
Segments      =          0            There is NO Polygon Topology.
0    bytes of Arc Attribute Data       0    bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =       3923             Tics        =          4
22   bytes of Attribute Data/Point     Annotations =          0
                                       Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            5.348 N           The coverage has not been Edited
Dangle  =            0.000 N           since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =               469049.438        Ymin =               395002.750
Xmax =               534380.188        Ymax =               448487.063
```

ITEMS 03/27/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E50_APP.PAT	ARC032DAT	3923	22	XX
DF	E50_APP.BND	ARC036DAT	1	16	XX
DF	E50_APP.TIC	ARC040DAT	4	12	XX

E50_APP.PAT
3923 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E50_APP#	4	5	B	0		-
13	E50_APP-ID	4	5	B	0		-
17	LIDAR	3	3	I	-		-
20	FLIGHT	3	3	I	-		-

LOG 03/27/90

Date	Time	Elap min	CPU sec	I/O opr	Command
3/26/90	13:39	3	77	2157	APPEND E50_APP POINT FEATURES
3/26/90	13:40	1	29	362	BUILD E50_APP POINT
3/26/90	16:59	5	128	5532	export cover E50_APP dub1:[pearl.denver]J20-E50_APP.e00

Description of Coverage: E50-TIN
Location: DISK$USER3:[DENVER.JAN20.DEV-50]
Summary: A TIN created from E50_APP using a proximal sampling distance of 1000 meters. E50-TIN is the first surface model in a series of surface generations.
Coverage Type: Lidar
Feature Type: TIN
Average RMS error: N/A
Input Scale: N/A
Date Produced: 7/20/88

TIN DESCRIPTION FOR E50-TIN

Tin Topology

Nodes = 168 Triangles = 323
Hull nodes = 11

Surface value range

Min Z = 0.000 Max Z = 260.000

Tin Boundary

Xmin = 469049.438 Ymin = 395002.750
Xmax = 534380.188 Ymax = 448487.031

LOG 03/27/90

Date	Time	Elap min	CPU sec	I/O opr	Command
7/20/88	11:54	2	28	1084	ARCTIN E50_APP E50-TIN POINT LIDAR # 2250
3/26/90	11: 6	0	3	137	externalall

Name of Lattice: E50-LAT.LAT
Location: DISK$USER3:[DENVER.JAN20.DEV-50]
Summary: A LATTICE created from TIN E50-TIN. A LATTICE is a binary system file which is interpolated from TIN based on starting origin, and number of points in X/Y direction. E50-LAT.LAT was used to create the VIP coverage E50-VIP.
Coverage Type: Lidar
Feature Type: LATTICE
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

LATTICE DESCRIPTION FOR E50-LAT.LAT

Lattice size and origin

Points in X/Y = 250 250 Origin (x,y)= 469049.438 395002.750

Lattice distance between points

Distance in X = 262.372 Distance in Y = 214.796

Surface value range

Min Z = 0.000 Max Z = 249.092

Lattice boundary

Xmin = 469049.438 Ymin = 395002.750
Xmax = 534380.188 Ymax = 448487.031

Description of Coverage: E50-VIP
Location: DISK$USER3:[DENVER.JAN20.DEV-50]
Summary: E50-VIP is a point coverage which represents, based on a 15% sample of E50-LAT.LAT, the surface. Attributes SPOT represent surface Z values, and SFCODE was a SPOT feature code, coded as one of the following:

2 for a surface maximum or convexity.
-2 for a surface minimum or concavity
1 for an inflection or transition close to a maximum
-1 an inflection or transition feature close to a minimum
0 for a point that is both a local surface maximum and a local surface surface minimum.

Coverage Type: Lidar
Feature Type: Point
Average RMS error: N/A
Input Scale: N/A
Date Produced: 7/20/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E50-VIP

```
         ARCS                                POLYGONS

Arcs          =          0            Polygons    =          0
Segments      =          0            There is NO Polygon Topology.
0    bytes of Arc Attribute Data       0    bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =       6457            Tics        =          4
24   bytes of Attribute Data/Point    Annotations =          0
                                      Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            5.305 N          The coverage has not been Edited
Dangle  =            0.000 N          since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =               471410.781       Ymin =               395217.531
Xmax =               533855.438       Ymax =               448272.250
```

ITEMS 03/27/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E50-VIP.BND	ARC039DAT	1	16	XX
DF	E50-VIP.TIC	ARC041DAT	4	12	XX
DF	E50-VIP.PAT	ARC042DAT	6457	24	XX

E50-VIP.PAT
6457 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E50-VIP#	4	5	B	0		-
13	E50-VIP-ID	4	5	B	0		-
17	SPOT	4	12	F	3		-
21	SFCODE	4	5	B	0		-

E50-VIP Continued...

LOG 03/27/90

```
   Date     Time Elap  CPU   I/O  Command
                  min  sec   opr
-------- ----- ---- ----  ---- ----------------
 7/20/88 12: 2   4    50   743 VIP E50-LAT E50-VIP 10
 3/26/90 11: 6   0     2    83 externalall
 3/26/90 16: 0  11   228  9570 export cover E50-VIP dub1:[pearl.denver]J20-E50-VIP.e00
```

Description of Coverage: E50-VT
Location: DISK$USER3:[DENVER.JAN20.DEV-50]
Summary: A TIN created from coverage E50-VIP using a proximal sampling distance of 1500 meters.
Coverage Type: Lidar
Feature Type: TIN
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/1/88

TIN DESCRIPTION FOR E50-VT

Tin Topology

Nodes = 275 Triangles = 527
Hull nodes = 21

Surface value range

Min Z = 0.000 Max Z = 249.092

Tin Boundary

Xmin = 471410.781 Ymin = 395217.531
Xmax = 533855.438 Ymax = 448272.250

LOG 03/27/90

Date	Time	Elap min	CPU sec	I/O opr	Command
7/20/88	12: 4	1	32	360	ARCTIN E50-VIP E50-VT POINT SPOT # 2250
3/26/90	11: 6	0	2	119	externalall
3/26/90	16: 1	0	6	221	export cover E50-VT dub1:[pearl.denver]J20-E50-VT.e00

Description of Coverage: E50-VT-HULL
Location: DISK$USER3:[DENVER.JAN20.DEV-50]
Summary: A coverage representing the boundary extent of TIN E50-VT. This coverage was used to set mapextents for plotting and creating views.
Coverage Type: Lidar
Feature Type: Polygon
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/1/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E50-VT-HULL

ARCS		POLYGONS	
Arcs =	21	Polygons =	2
Segments =	21	Polygon Topology is present.	
0 bytes of Arc Attribute Data		16 bytes of Polygon Attribute Data	

POINTS		SECONDARY FEATURES	
Label Points =	0	Tics =	4
		Annotations =	0
		Links =	0

TOLERANCES		STATUS
Fuzzy =	5.305 N	The coverage has not been Edited
Dangle =	0.000 N	since the last BUILD or CLEAN.

COVERAGE BOUNDARY

Xmin =	471410.781	Ymin =	395217.531
Xmax =	533855.438	Ymax =	448272.250

ITEMS 03/27/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E50-VT-HULL.BND	ARC022DAT	1	16	XX
DF	E50-VT-HULL.TIC	ARC023DAT	4	12	XX
DF	E50-VT-HULL.PAT	ARC029DAT	3	16	XX

E50-VT-HULL.PAT
3 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E50-VT-HULL#	4	5	B	0		-
13	E50-VT-HULL-ID	4	5	B	0		-

LOG 03/27/90

Date	Time	Elap min	CPU sec	I/O opr	Command
8/30/88	19:33	1	10	903	tinarc e50-vt e50-vt-hull hull
3/26/90	11: 6	0	2	82	externalall
3/26/90	16: 0	0	8	341	export cover E50-VT-HULL dub1:[pearl.denver]J20-E50-VT-HULL.e00

Description of Coverage: E50-VTC
Location: DISK$USER3:[DENVER.JAN20.DEV-50]
Summary: A Lidar contour coverage at intervals of 10 Lidar Units. E50-VTC was interpolated from E50-VT. Contours range from 10 to 240 Lidar Units.
Coverage Type: Lidar
Feature Type: Line
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/1/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E50-VTC

```
         ARCS                                POLYGONS

Arcs          =        329            Polygons    =          0
Segments      =      12432            There is NO Polygon Topology.
32   bytes of Arc Attribute Data      0    bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =          0            Tics        =          4
                                      Annotations =          0
                                      Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            5.304 N          The coverage has not been Edited
Dangle  =            0.000 N          since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =               471417.031       Ymin =               395222.844
Xmax =               533849.188       Ymax =               448266.938
```

ITEMS 03/27/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E50-VTC.BND	ARC035DAT	1	16	XX
DF	E50-VTC.TIC	ARC037DAT	4	12	XX
DF	E50-VTC.AAT	ARC038DAT	329	32	XX

E50-VTC.AAT
329 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	FNODE#	4	5	B	0		-
5	TNODE#	4	5	B	0		-
9	LPOLY#	4	5	B	0		-
13	RPOLY#	4	5	B	0		-
17	LENGTH	4	12	F	3		-
21	E50-VTC#	4	5	B	0		-
25	E50-VTC-ID	4	5	B	0		-
29	LIDAR	4	12	F	3		-

LOG 03/27/90

Date	Time	Elap min	CPU sec	I/O opr	Command
7/20/88	12:19	16	333	546	TINCONTOUR E50-VT E50-VTC 10 0 LIDAR SMOOTH
3/26/90	11: 6	0	2	83	externalall
3/26/90	16: 3	3	74	3652	export cover E50-VTC dub1:[pearl.denver]J20-E50-VTC.e00

Name of Lattice: E50-VTL.LAT
Location: DISK$USER3:[DENVER.JAN20.DEV-50]
Summary: A LATTICE created from TIN E50-VT. A LATTICE is a binary system file which is interpolated from TIN based on starting origin, and number of points in X/Y direction. E50-VTL.LAT was used to create polygon coverage E50-VTLP.
Coverage Type: Lidar
Feature Type: LATTICE
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

LATTICE DESCRIPTION FOR E50-VTL.LAT

Lattice size and origin

Points in X/Y = 250 250 Origin (x,y)= 471410.781 395217.531

Lattice distance between points

Distance in X = 250.782 Distance in Y = 213.071

Surface value range

Min Z = 0.000 Max Z = 247.910

Lattice boundary

Xmin = 471410.781 Ymin = 395217.531
Xmax = 533855.438 Ymax = 448272.250

Description of Coverage: E50-VTLP
Location: DISK$USER3:[DENVER.JAN20.DEV-50]
Summary: A polygon coverage representing Lidar backscatter based on 5 Lidar Unit intervals. Interpolated from LATTICE E50-VTL using the INFO lookup table LIDAR2_LKUP. Lidar ranges from 5 to a maximum value of 250.
Coverage Type: Lidar
Feature Type: Polygon
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/1/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E50-VTLP

ARCS		POLYGONS	
Arcs =	14145	Polygons =	6261
Segments =	42560	Polygon Topology is present.	
0 bytes of Arc Attribute Data		23 bytes of Polygon Attribute Data	

POINTS		SECONDARY FEATURES	
Label Points =	6260	Tics =	4
		Annotations =	0
		Links =	0

TOLERANCES		STATUS
Fuzzy =	5.327 N	The coverage has not been Edited
Dangle =	0.000 N	since the last BUILD or CLEAN.

COVERAGE BOUNDARY

Xmin =	471410.781	Ymin =	395217.531
Xmax =	534106.250	Ymax =	448485.313

ITEMS 03/27/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E50-VTLP.BND	ARC030DAT	1	16	XX
DF	E50-VTLP.TIC	ARC031DAT	4	12	XX
DF	E50-VTLP.PAT	ARC033DAT	6261	23	XX

E50-VTLP.PAT
6261 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E50-VTLP#	4	5	B	0		-
13	E50-VTLP-ID	4	5	B	0		-
17	RANGE-CODE	4	5	B	0		-
21	RNGE	3	3	I	-		-

LOG 03/27/90

Date	Time	Elap min	CPU sec	I/O opr	Command
7/20/88	13:50	87	665	59467	LATTICEPOLY E50-VTL E50-VTLP RANGE LIDAR2_LKUP
3/26/90	11: 6	0	2	82	externalall
3/26/90	16:53	50	895	45250	export cover E50-VTLP dub1:[pearl.denver]J20-E50-VTLP.e00

Description of Coverage: E50-RANGE
Location: DISK$USER3:[DENVER.JAN20.DEV-50]
Summary: E50-RANGE represents Lidar intensities at 9 specific ranges coded as: 30, 60, 95, 125, 160, 190, 225, 250 and > 250. E50-RANGE was dissolved from E50-VTLP based on these nine Lidar intensities.
Coverage Type: Lidar
Feature Type: Polygon
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E50-RANGE

ARCS		POLYGONS	
Arcs =	189	Polygons =	94
Segments =	8173	Polygon Topology is present.	
0 bytes of Arc Attribute Data		19 bytes of Polygon Attribute Data	

POINTS		SECONDARY FEATURES	
Label Points =	93	Tics =	4
		Annotations =	0
		Links =	0

TOLERANCES		STATUS
Fuzzy =	0.100 V	The coverage has not been Edited
Dangle =	1.000 V	since the last BUILD or CLEAN.

COVERAGE BOUNDARY

Xmin =	471661.563	Ymin =	395430.594
Xmax =	534106.250	Ymax =	448485.313

ITEMS 03/27/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E50-RANGE.PAT	ARC017DAT	94	19	XX
DF	E50-RANGE.BND	ARC025DAT	1	16	XX
DF	E50-RANGE.TIC	ARC026DAT	4	12	XX

E50-RANGE.PAT
94 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E50-RANGE#	4	5	B	0		-
13	E50-RANGE-ID	4	5	B	0		-
17	RNGE	3	3	I	-		-

LOG 03/27/90

Date	Time	Elap min	CPU sec	I/O opr	Command
8/30/88	22:47	128	429	70439	DISSOLVE E50-VTLP E50-RANGE RNGE
8/31/88	8:49	3	129	2130	CLEAN E50-RANGE # 1 .1
3/26/90	11: 6	0	2	98	externalall
3/26/90	15:49	3	55	2653	export cover E50-RANGE

dub1:[pearl.denver]J20-E50-RANGE.e00

Name of Coverage: E50-DEMOTIN
Location: DISK$USER3:[DENVER.JAN20.DEV-50]
Summary: A coverage which represents the TIN structure of E50-VT. The DBC demo uses this coverage for display purposes.
Coverage Type: Lidar
Feature Type: Line
Average RMS error: N/A
Input Scale: N/A
Date Produced: 3/28/90

DESCRIPTION OF SINGLE PRECISION COVERAGE E50-DEMOTIN

```
         ARCS                                POLYGONS

Arcs           =        801            Polygons    =          0
Segments       =        801            There is NO Polygon Topology.
56   bytes of Arc Attribute Data        0    bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =          0              Tics        =          4
                                        Annotations =          0
                                        Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            5.305 N            The coverage has not been Edited
Dangle  =            0.000 N            since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =               471410.781         Ymin =                395217.531
Xmax =               533855.438         Ymax =                448272.250
```

ITEMS 03/29/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E50-DEMOTIN.BND	ARC059DAT	1	16	XX
DF	E50-DEMOTIN.AAT	ARC060DAT	801	56	XX
DF	E50-DEMOTIN.TIC	ARC062DAT	4	12	XX

E50-DEMOTIN.AAT
801 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	FNODE#	4	5	B	0		-
5	TNODE#	4	5	B	0		-
9	LPOLY#	4	5	B	0		-
13	RPOLY#	4	5	B	0		-
17	LENGTH	4	12	F	3		-
21	E50-DEMOTIN#	4	5	B	0		-
25	E50-DEMOTIN-ID	4	5	B	0		-
29	PERCENT_SLOPE	4	12	F	3		-
33	LSLOPE	4	12	F	3		-
37	RSLOPE	4	12	F	3		-
41	LASPECT	4	12	F	3		-
45	RASPECT	4	12	F	3		-
49	ZFROM	4	12	F	3		-
53	ZTO	4	12	F	3		-

LOG 03/29/90

```
   Date     Time Elap  CPU   I/O  Command
```

```
                 min  sec   opr
-------- ----- ---- ----  ---- ----------------
 3/28/90 12:43   0    13   904 tinarc e50-vt e50-demotin line percent
```

III. DEV-60 (Lidar surfaces generated based on 60 meters AGL).

Description of Coverage: E60_APP
Location: DUB0:[DENVER.JAN20.DEV-60]
Summary: E60_APP represents Lidar return values collected 1/20/88 at 60 meters AGL from 11:45 to 02:30 PM. Mission data was organized by transect and was obtained from data file [denver.exe]DB3.GND. Data was generated from locational values collected at time of mission.
Coverage Type: Lidar
Feature Type: Point
Input Scale: N/A
Digitized by: N/A
Date Produced: 11/1/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E60_APP

```
         ARCS                                POLYGONS

Arcs          =          0            Polygons    =          0
Segments      =          0            There is NO Polygon Topology.
0    bytes of Arc Attribute Data       0    bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =       3923            Tics        =          4
22   bytes of Attribute Data/Point    Annotations =          0
                                      Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            5.348 N          The coverage has not been Edited
Dangle  =            0.000 N          since the last BUILD or CLEAN.

                   COVERAGE BOUNDARY

Xmin =               469049.438       Ymin =               395002.500
Xmax =               534380.188       Ymax =               448487.000
```

ITEMS 03/27/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E60_APP.PAT	ARC050DAT	3923	22	XX
DF	E60_APP.BND	ARC051DAT	1	16	XX
DF	E60_APP.TIC	ARC052DAT	4	12	XX

E60_APP.PAT
3923 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E60_APP#	4	5	B	0		-
13	E60_APP-ID	4	5	B	0		-
17	LIDAR	3	3	I	-		-
20	FLIGHT	3	3	I	-		-

LOG 03/27/90

Date	Time	Elap min	CPU sec	I/O opr	Command
7/20/88	11:47	0	4	212	CREATE E60_APP-UTM
7/20/88	11:49	0	4	184	RENAME E60_APP-UTM E60_APP

```
3/26/90 11:22   0     2    89 externalall
3/26/90 17:50   4   124  5528 export cover E60_APP dub1:[pearl.denver]J20-E60_APP.e00
```

Description of Coverage: E60-TIN
Location: DUB0:[DENVER.JAN20.DEV-60]
Summary: A TIN created from E60_APP using a proximal sampling distance of 1000 meters. E60-TIN is the first surface model in a series of surface generations.
Coverage Type: Lidar
Feature Type: TIN
Average RMS error: N/A
Input Scale: N/A
Date Produced: 7/20/88

TIN DESCRIPTION FOR E60-TIN

Tin Topology

Nodes	= 168	Triangles	= 323
Hull nodes	= 11		

Surface value range

Min Z	= 0.000	Max Z	= 258.000

Tin Boundary

Xmin = 469049.438	Ymin = 395002.500
Xmax = 534380.188	Ymax = 448487.000

LOG 03/27/90

Date	Time	Elap min	CPU sec	I/O opr	Command
7/20/88	13:51	1	26	1078	ARCTIN E60_APP E60-TIN POINT LIDAR # 2250.0
3/26/90	11:21	0	2	122	externalall

Name of Lattice: E60-LAT.LAT
Location: DISK$USER3:[DENVER.JAN20.DEV-60]
Summary: A LATTICE created from TIN E60-TIN. A LATTICE is a binary system file which is interpolated from TIN based on starting origin, and number of points in X/Y direction. E60-LAT.LAT was used to create the VIP coverage E60-VIP.
Coverage Type: Lidar
Feature Type: LATTICE
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

LATTICE DESCRIPTION FOR E60-LAT.LAT

Lattice size and origin

Points in X/Y = 250 250 Origin (x,y)= 469049.438 395002.500

Lattice distance between points

Distance in X = 262.372 Distance in Y = 214.797

Surface value range

Min Z = 0.000 Max Z = 249.220

Lattice boundary

Xmin = 469049.438 Ymin = 395002.500
Xmax = 534380.188 Ymax = 448487.000

Description of Coverage: E60-VIP
Location: DUB0:[DENVER.JAN20.DEV-60]
Summary: E60-VIP is a point coverage which represents, based on a 15% sample of E60-LAT.LAT, the surface. Attributes SPOT represent surface Z values, and SFCODE was a SPOT feature code, coded as one of the following:

2 for a surface maximum or convexity.
-2 for a surface minimum or concavity
1 for an inflection or transition close to a maximum
-1 an inflection or transition feature close to a minimum
0 for a point that is both a local surface maximum and a local surface surface minimum.

Coverage Type: Lidar
Feature Type: Point
Average RMS error: N/A
Input Scale: N/A
Date Produced: 7/20/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E60-VIP

```
         ARCS                                POLYGONS

Arcs          =          0            Polygons    =          0
Segments      =          0            There is NO Polygon Topology.
0    bytes of Arc Attribute Data      0    bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =       6689            Tics        =          4
24   bytes of Attribute Data/Point    Annotations =          0
                                      Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            5.305 N          The coverage has not been Edited
Dangle  =            0.000 N          since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =               470623.688       Ymin =               395217.313
Xmax =               533593.063       Ymax =               448272.219
```

ITEMS 03/27/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E60-VIP.BND	ARC054DAT	1	16	XX
DF	E60-VIP.TIC	ARC055DAT	4	12	XX
DF	E60-VIP.PAT	ARC056DAT	6689	24	XX

E60-VIP.PAT
6689 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E60-VIP#	4	5	B	0		-
13	E60-VIP-ID	4	5	B	0		-
17	SPOT	4	12	F	3		-
21	SFCODE	4	5	B	0		-

LOG 03/27/90

Date	Time	Elap min	CPU sec	I/O opr	Command

```
7/20/88 13:54   1    50   751 VIP E60-LAT E60-VIP 10
3/26/90 11:21   0     2    89 externalall
3/26/90 17:10   7   220  9892 export cover E60-VIP dub1:[pearl.denver]J20-E60-VIP.e00
```

Description of Coverage: E60-VT
Location: DUB0:[DENVER.JAN20.DEV-60]
Summary: A TIN created from coverage E60-VIP using a proximal sampling distance of 1500 meters.
Coverage Type: Lidar
Feature Type: TIN
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/1/88

TIN DESCRIPTION FOR E60-VT

Tin Topology

Nodes = 292 Triangles = 557
Hull nodes = 25

Surface value range

Min Z = 0.000 Max Z = 249.220

Tin Boundary

Xmin = 471673.156 Ymin = 395432.094
Xmax = 533593.063 Ymax = 448272.219

LOG 03/27/90

Date	Time	Elap min	CPU sec	I/O opr	Command
7/20/88	13:54	1	30	355	ARCTIN E60-VIP E60-VT POINT SPOT # 2250.0
3/26/90	11:22	0	2	122	externalall
3/26/90	17:10	0	5	222	export cover E60-VT dub1:[pearl.denver]J20-E60-VT.e00

Description of Coverage: E60-VT-HULL
Location: DUB0:[DENVER.JAN20.DEV-60]
Summary: A coverage representing the boundary extent of TIN E60-VT. This coverage was used to set mapextents for plotting and creating views.
Coverage Type: Lidar
Feature Type: Polygon
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/1/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E60-VT-HULL

```
         ARCS                                POLYGONS

Arcs          =          25            Polygons    =          2
Segments      =          25            Polygon Topology is present.
0    bytes of Arc Attribute Data       16   bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =          0             Tics        =          4
                                       Annotations =          0
                                       Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            5.284 N           The coverage has not been Edited
Dangle  =            0.000 N           since the last BUILD or CLEAN.

                   COVERAGE BOUNDARY

Xmin =               471673.156        Ymin =               395432.094
Xmax =               533593.063        Ymax =               448272.219
```

ITEMS 03/27/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E60-VT-HULL.BND	ARC039DAT	1	16	XX
DF	E60-VT-HULL.TIC	ARC040DAT	4	12	XX
DF	E60-VT-HULL.PAT	ARC042DAT	3	16	XX

E60-VT-HULL.PAT
3 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E60-VT-HULL#	4	5	B	0		-
13	E60-VT-HULL-ID	4	5	B	0		-

LOG 03/27/90

```
   Date     Time Elap  CPU   I/O  Command
                 min  sec   opr
 -------- ----- ---- ----  ---- ----------------
  8/31/88  9:16   1    12  1276 tinarc e60-vt e60-vt-hull hull
  3/26/90 11:21   0     2    83 externalall
  3/26/90   17:10         0              8         355   export   cover   E60-VT-HULL
dub1:[pearl.denver]J20-E60-VT-HULL.e00
```

Description of Coverage: E60-VTC
Location: DUB0:[DENVER.JAN20.DEV-60]
Summary: A Lidar contour coverage at intervals of 10 Lidar Units. E60-VTC was interpolated from E60-VT. Contours range from 10 to 230 Lidar Units.
Coverage Type: Lidar
Feature Type: Line
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/1/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E60-VTC

ARCS		POLYGONS	
Arcs =	325	Polygons =	0
Segments =	13507	There is NO Polygon Topology.	
32 bytes of Arc Attribute Data		0 bytes of Polygon Attribute Data	

POINTS		SECONDARY FEATURES	
Label Points =	0	Tics =	4
		Annotations =	0
		Links =	0

TOLERANCES		STATUS
Fuzzy =	5.283 N	The coverage has not been Edited
Dangle =	0.000 N	since the last BUILD or CLEAN.

COVERAGE BOUNDARY

Xmin =	471679.344	Ymin =	395437.375
Xmax =	533586.875	Ymax =	448266.938

ITEMS 03/27/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E60-VTC.BND	ARC047DAT	1	16	XX
DF	E60-VTC.TIC	ARC048DAT	4	12	XX
DF	E60-VTC.AAT	ARC049DAT	325	32	XX

E60-VTC.AAT
325 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	FNODE#	4	5	B	0		-
5	TNODE#	4	5	B	0		-
9	LPOLY#	4	5	B	0		-
13	RPOLY#	4	5	B	0		-
17	LENGTH	4	12	F	3		-
21	E60-VTC#	4	5	B	0		-
25	E60-VTC-ID	4	5	B	0		-
29	LIDAR	4	12	F	3		-

LOG 03/27/90

Date	Time	Elap min	CPU sec	I/O opr	Command
7/20/88	14: 1	6	340	552	TINCONTOUR E60-VT E60-VTC 10 0 LIDAR SMOOTH
3/26/90	11:22	0	2	89	externalall
3/26/90	17:13	2	77	3882	export cover E60-VTC dub1:[pearl.denver]J20-E60-VTC.e00

Name of Lattice: E60-VTL.LAT
Location: DISK$USER3:[DENVER.JAN20.DEV-60]
Summary: A LATTICE created from TIN E60-VT. A LATTICE is a binary system file which is interpolated from TIN based on starting origin, and number of points in X/Y direction. E60-VTL.LAT was used to create polygon coverage E60-VTLP.
Coverage Type: Lidar
Feature Type: LATTICE
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

LATTICE DESCRIPTION FOR E60-VTL.LAT

Lattice size and origin

Points in X/Y = 250 250 Origin (x,y)= 471673.156 395432.094

Lattice distance between points

Distance in X = 248.674 Distance in Y = 212.209

Surface value range

Min Z = 0.000 Max Z = 233.903

Lattice boundary

Xmin = 471673.156 Ymin = 395432.094
Xmax = 533593.063 Ymax = 448272.219

Description of Coverage: E60-VTLP
Location: DUB0:[DENVER.JAN20.DEV-60]
Summary: A polygon coverage representing Lidar backscatter based on 5 Lidar Unit intervals. Interpolated from LATTICE E60-VTL using the INFO lookup table LIDAR2_LKUP. Lidar ranges from 5 to a maximum value of 230.
Coverage Type: Lidar
Feature Type: Polygon
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/1/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E60-VTLP

```
         ARCS                                POLYGONS

Arcs          =      15674            Polygons    =       6918
Segments      =      45961            Polygon Topology is present.
0    bytes of Arc Attribute Data       23   bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =       6917            Tics        =          4
                                      Annotations =          0
                                      Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            5.305 N          The coverage has not been Edited
Dangle  =            0.000 N          since the last BUILD or CLEAN.

                   COVERAGE BOUNDARY

Xmin =               471673.156       Ymin =               395432.094
Xmax =               533841.750       Ymax =               448484.438
```

ITEMS 03/27/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E60-VTLP.BND	ARC043DAT	1	16	XX
DF	E60-VTLP.TIC	ARC044DAT	4	12	XX
DF	E60-VTLP.PAT	ARC046DAT	6918	23	XX

E60-VTLP.PAT
6918 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E60-VTLP#	4	5	B	0		-
13	E60-VTLP-ID	4	5	B	0		-
17	RANGE-CODE	4	5	B	0		-
21	RNGE	3	3	I	-		-

LOG 03/27/90

```
   Date     Time Elap  CPU   I/O  Command
                 min  sec   opr
 -------- ----- ---- ----  ---- ----------------
  7/20/88 16:18 136   712 61467 LATTICEPOLY E60-VTL E60-VTLP RANGE LIDAR2_LKUP
  3/26/90 11:22   0     2    90 externalall
  3/26/90 17:46  33   932 49830 export cover E60-VTLP dub1:[pearl.denver]J20-E60-VTLP.e00
```

Description of Coverage: E60-RANGE
Location: DUB0:[DENVER.JAN20.DEV-60]
Summary: E50-RANGE represents Lidar intensities at 9 specific ranges coded as: 30, 60, 95, 125, 160, 190, 225, 250 and > 250. E50-RANGE was dissolved from E50-VTLP based on these nine Lidar intensities.
Coverage Type: Lidar
Feature Type: Polygon
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E60-RANGE

```
         ARCS                                POLYGONS

Arcs          =        140            Polygons     =         73
Segments      =       8881            Polygon Topology is present.
0    bytes of Arc Attribute Data      19   bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =         73            Tics         =          4
                                      Annotations  =          0
                                      Links        =          0
         TOLERANCES                          STATUS

Fuzzy   =             5.305 N         The coverage has not been Edited
Dangle  =             0.000 N         since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =                471921.844      Ymin =                395432.094
Xmax =                533593.063      Ymax =                448484.438
```

ITEMS 03/27/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E60-RANGE.PAT	ARC034DAT	73	19	XX
DF	E60-RANGE.BND	ARC035DAT	1	16	XX
DF	E60-RANGE.TIC	ARC036DAT	4	12	XX

E60-RANGE.PAT
73 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E60-RANGE#	4	5	B	0		-
13	E60-RANGE-ID	4	5	B	0		-
17	RNGE	3	3	I	-		-

LOG 03/27/90

```
   Date     Time Elap  CPU   I/O  Command
                 min  sec   opr
 -------- ----- ---- ----  ---- ----------------
  8/31/88 16: 8 122   507 79502 DISSOLVE E60-VTLP E60-RANGE RNGE
  3/26/90 11:21   0     2    82 externalall
  3/26/90 17: 3   2    53  2715 export cover E60-RANGE
                                dub1:[pearl.denver]J20-E60-RANGE.e00
```

Description of Coverage: E60-DEMOTIN
Location: DUB0:[DENVER.JAN20.DEV-60]
Summary: A coverage which represents the TIN structure of E60-VT. The DBC demo uses this coverage for display purposes.
Coverage Type: Lidar
Feature Type: Line
Average RMS error: N/A
Input Scale: N/A
Date Produced: 10/28/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E60-DEMOTIN

```
         ARCS                                POLYGONS

Arcs          =        848            Polygons    =          0
Segments      =        848            There is NO Polygon Topology.
56   bytes of Arc Attribute Data       0    bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =          0            Tics        =          4
                                      Annotations =          0
                                      Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            5.284 N          The coverage has not been Edited
Dangle  =            0.000 N          since the last BUILD or CLEAN.

                   COVERAGE BOUNDARY

Xmin =               471673.156       Ymin =               395432.094
Xmax =               533593.063       Ymax =               448272.219
```

ITEMS 03/27/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E60-DEMOTIN.BND	ARC031DAT	1	16	XX
DF	E60-DEMOTIN.TIC	ARC032DAT	4	12	XX
DF	E60-DEMOTIN.AAT	ARC038DAT	848	56	XX

E60-DEMOTIN.AAT
848 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	FNODE#	4	5	B	0		-
5	TNODE#	4	5	B	0		-
9	LPOLY#	4	5	B	0		-
13	RPOLY#	4	5	B	0		-
17	LENGTH	4	12	F	3		-
21	E60-DEMOTIN#	4	5	B	0		-
25	E60-DEMOTIN-ID	4	5	B	0		-
29	PERCENT_SLOPE	4	12	F	3		-
33	LSLOPE	4	12	F	3		-
37	RSLOPE	4	12	F	3		-
41	LASPECT	4	12	F	3		-
45	RASPECT	4	12	F	3		-
49	ZFROM	4	12	F	3		-
53	ZTO	4	12	F	3		-

LOG 03/27/90

```
   Date     Time Elap  CPU   I/O  Command
                 min  sec   opr
```

10/28/88	10:23	1	13	590	TINARC E60-VT E60-DEMOTIN LINE PERCENT

IV. DEV-80 (Lidar surfaces generated based on 80 meters AGL).

Description of Coverage: E80_APP
Location: DUB0:[DENVER.JAN20.DEV-80]
Summary: E80_APP represents Lidar return values collected 1/20/88 at 80 meters AGL from 11:45 to 02:30 PM. Mission data was organized by transect and was obtained from data file [denver.exe]DB3.GND. Data was generated from locational values collected at time of mission.
Coverage Type: Lidar
Feature Type: Point
Input Scale: N/A
Digitized by: N/A
Date Produced: 11/1/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E80_APP

```
         ARCS                                POLYGONS

Arcs          =          0            Polygons    =          0
Segments      =          0            There is NO Polygon Topology.
0    bytes of Arc Attribute Data       0    bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =       3923            Tics        =          4
22   bytes of Attribute Data/Point    Annotations =          0
                                      Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            5.348 N          The coverage has not been Edited
Dangle  =            0.000 N          since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =               469049.438       Ymin =               395002.500
Xmax =               534380.188       Ymax =               448487.000
```

ITEMS 03/28/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E80_APP.PAT	ARC061DAT	3923	22	XX
DF	E80_APP.BND	ARC062DAT	0	16	XX
DF	E80_APP.TIC	ARC063DAT	0	12	XX

E80_APP.PAT
3923 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E80_APP#	4	5	B	0		-
13	E80_APP-ID	4	5	B	0		-
17	LIDAR	3	3	I	-		-
20	FLIGHT	3	3	I	-		-

LOG 03/28/90

Date	Time	Elap min	CPU sec	I/O opr	Command
7/20/88	13:35	0	4	212	CREATE E80_APP
3/26/90	11:22	0	2	89	EXTERNALALL

Description of Coverage: E80-TIN
Location: DUB0:[DENVER.JAN20.DEV-80]
Summary: A TIN created from E80_APP using a proximal sampling distance of 1000 meters. E80-TIN is the first surface model in a series of surface generations.
Coverage Type: Lidar
Feature Type: TIN
Average RMS error: N/A
Input Scale: N/A
Date Produced: 7/20/88

TIN DESCRIPTION FOR E80-TIN

Tin Topology

Nodes	= 166	Triangles	= 319
Hull nodes	= 11		

Surface value range

Min Z	= 0.000	Max Z	= 247.000

Tin Boundary

Xmin = 469049.438	Ymin = 395002.500
Xmax = 534380.188	Ymax = 448487.000

LOG 03/28/90

Date	Time	Elap min	CPU sec	I/O opr	Command
7/20/88	16:21	2	27	1084	ARCTIN E80_APP E80-TIN POINT LIDAR # 2225.0
3/26/90	11:22	0	3	127	EXTERNALALL

Name of Lattice: E80-LAT.LAT
Location: DISK$USER3:[DENVER.JAN20.DEV-80]
Summary: A LATTICE created from TIN E80-TIN. A LATTICE is a binary system file which is interpolated from TIN based on starting origin, and number of points in X/Y direction. E80-LAT.LAT was used to create the VIP coverage E80-VIP.
Coverage Type: Lidar
Feature Type: LATTICE
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

LATTICE DESCRIPTION FOR E80-LAT.LAT

Lattice size and origin

Points in X/Y = 250 250 Origin (x,y)= 469049.438 395002.500

Lattice distance between points

Distance in X = 262.372 Distance in Y = 214.797

Surface value range

Min Z = 0.000 Max Z = 247.000

Lattice boundary

Xmin = 469049.438 Ymin = 395002.500
Xmax = 534380.188 Ymax = 448487.000

Description of Coverage: E80-VIP
Location: DUB0:[DENVER.JAN20.DEV-80]
Summary: E80-VIP is a point coverage which represents, based on a 15% sample of E80-LAT.LAT, the surface. Attributes SPOT represent surface Z values, and SFCODE was a SPOT feature code, coded as one of the following:

2 for a surface maximum or convexity.
-2 for a surface minimum or concavity
1 for an inflection or transition close to a maximum
-1 an inflection or transition feature close to a minimum
0 for a point that is both a local surface maximum and a local surface surface minimum.

Coverage Type: Lidar
Feature Type: Point
Average RMS error: N/A
Input Scale: N/A
Date Produced: 7/20/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E80-VIP

```
         ARCS                                POLYGONS

Arcs          =          0            Polygons    =          0
Segments      =          0            There is NO Polygon Topology.
0    bytes of Arc Attribute Data       0    bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =       6870            Tics        =          4
24   bytes of Attribute Data/Point    Annotations =          0
                                      Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            5.305 N          The coverage has not been Edited
Dangle  =            0.000 N          since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =               471935.531       Ymin =               395217.313
Xmax =               533855.438       Ymax =               448272.219
```

ITEMS 03/28/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E80-VIP.BND	ARC064DAT	1	16	XX
DF	E80-VIP.TIC	ARC065DAT	4	12	XX
DF	E80-VIP.PAT	ARC066DAT	6870	24	XX

E80-VIP.PAT
6870 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E80-VIP#	4	5	B	0		-
13	E80-VIP-ID	4	5	B	0		-
17	SPOT	4	12	F	3		-
21	SFCODE	4	5	B	0		-

LOG 03/28/90

Date	Time	Elap min	CPU sec	I/O opr	Command

```
7/20/88 16:26   2    52   776 VIP E80-LAT E80-VIP 10
3/26/90 11:22   0     2    94 EXTERNALALL
3/27/90  8:34   8   232 10176 export cover E80-VIP dub1:[pearl.denver]J20-E80-VIP.e00
```

Description of Coverage: E80-VT
Location: DUB0:[DENVER.JAN20.DEV-80]
Summary: A TIN created from coverage E80-VIP using a proximal sampling distance of 1500 meters.
Coverage Type: Lidar
Feature Type: TIN
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/1/88

TIN DESCRIPTION FOR E80-VT

Tin Topology

Nodes = 284 Triangles = 538
Hull nodes = 28

Surface value range

Min Z = 0.000 Max Z = 247.000

Tin Boundary

Xmin = 471935.531 Ymin = 395432.094
Xmax = 533855.438 Ymax = 448272.219

LOG 03/28/90

Date	Time	Elap min	CPU sec	I/O opr	Command
7/20/88	16:28	1	33	363	ARCTIN E80-VIP E80-VT POINT SPOT # 2225.0
3/26/90	11:22	0	3	127	EXTERNALALL
3/27/90	8:34	0	5	223	export cover E80-VT dub1:[pearl.denver]J20-E80-VT.e00

Description of Coverage: E80-VT-HULL
Location: DUB0:[DENVER.JAN20.DEV-80]
Summary: A coverage representing the boundary extent of TIN E80-VT. This coverage was used to set mapextents for plotting and creating views.
Coverage Type: Lidar
Feature Type: Polygon
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/1/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E60-VT-HULL

```
         ARCS                                POLYGONS

Arcs          =          28            Polygons    =          2
Segments      =          28            Polygon Topology is present.
0    bytes of Arc Attribute Data       16   bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =          0             Tics        =          4
                                       Annotations =          0
                                       Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            5.284 N           The coverage has not been Edited
Dangle  =            0.000 N           since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =               471935.531        Ymin =               395432.094
Xmax =               533855.438        Ymax =               448272.219
```

ITEMS 03/28/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E80-VT-HULL.BND	ARC048DAT	1	16	XX
DF	E80-VT-HULL.TIC	ARC049DAT	4	12	XX
DF	E80-VT-HULL.PAT	ARC050DAT	3	16	XX

E80-VT-HULL.PAT
3 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E80-VT-HULL#	4	5	B	0		-
13	E80-VT-HULL-ID	4	5	B	0		-

LOG 03/28/90

Date	Time	Elap min	CPU sec	I/O opr	Command
8/31/88	9:16	2	12	1275	tinarc e80-vt e80-vt-hull hull
3/26/90	11:22	0	2	90	EXTERNALALL
3/27/90	8:34	0	8	353	export cover E80-VT-HULL dub1:[pearl.denver]J20-E80-VT-HULL.e00

Description of Coverage: E80-VTC
Location: DUB0:[DENVER.JAN20.DEV-80]
Summary: A Lidar contour coverage at intervals of 10 Lidar Units. E80-VTC was interpolated from E80-VT. Contours range from 10 to 240 Lidar Units.
Coverage Type: Lidar
Feature Type: Line
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/1/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E80-VTC

ARCS		POLYGONS	
Arcs =	310	Polygons =	0
Segments =	12806	There is NO Polygon Topology.	
32 bytes of Arc Attribute Data		0 bytes of Polygon Attribute Data	

POINTS		SECONDARY FEATURES	
Label Points =	0	Tics =	4
		Annotations =	0
		Links =	0

TOLERANCES		STATUS
Fuzzy =	5.283 N	The coverage has not been Edited
Dangle =	0.000 N	since the last BUILD or CLEAN.

COVERAGE BOUNDARY

Xmin =	471941.719	Ymin =	395437.375
Xmax =	533849.250	Ymax =	448266.938

ITEMS 03/28/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E80-VTC.BND	ARC055DAT	1	16	XX
DF	E80-VTC.TIC	ARC056DAT	4	12	XX
DF	E80-VTC.AAT	ARC059DAT	310	32	XX

E80-VTC.AAT
310 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	FNODE#	4	5	B	0		-
5	TNODE#	4	5	B	0		-
9	LPOLY#	4	5	B	0		-
13	RPOLY#	4	5	B	0		-
17	LENGTH	4	12	F	3		-
21	E80-VTC#	4	5	B	0		-
25	E80-VTC-ID	4	5	B	0		-
29	LIDAR	4	12	F	3		-

LOG 03/28/90

Date	Time	Elap min	CPU sec	I/O opr	Command
7/20/88	16:39	11	324	564	TINCONTOUR E80-VT E80-VTC 10 0 LIDAR SMOOTH
3/26/90	11:22	0	2	90	EXTERNALALL
3/27/90	8:37	2	73	3696	export cover E80-VTC dub1:[pearl.denver]J20-E80-VTC.e00

Name of Lattice: E80-VTL.LAT
Location: DISK$USER3:[DENVER.JAN20.DEV-80]
Summary: A LATTICE created from TIN E80-VT. A LATTICE is a binary system file which is interpolated from TIN based on starting origin, and number of points in X/Y direction. E80-VTL.LAT was used to create polygon coverage E80-VTLP.
Coverage Type: Lidar
Feature Type: LATTICE
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

LATTICE DESCRIPTION FOR E80-VTL.LAT

Lattice size and origin

Points in X/Y = 250 250 Origin (x,y)= 471935.531 395432.094

Lattice distance between points

Distance in X = 248.674 Distance in Y = 212.209

Surface value range

Min Z = 4.422 Max Z = 247.000

Lattice boundary

Xmin = 471935.531 Ymin = 395432.094
Xmax = 533855.438 Ymax = 448272.219

Description of Coverage: E80-VTLP
Location: DUB0:[DENVER.JAN20.DEV-80]
Summary: A polygon coverage representing Lidar backscatter based on 5 Lidar Unit intervals. Interpolated from LATTICE E80-VTL using the INFO lookup table LIDAR2_LKUP. Lidar ranges from 5 to a maximum value of 250.
Coverage Type: Lidar
Feature Type: Polygon
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/1/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E80-VTLP

```
         ARCS                                POLYGONS

Arcs          =      13801            Polygons    =       6041
Segments      =      42986            Polygon Topology is present.
0    bytes of Arc Attribute Data       23   bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =       6040            Tics        =          4
                                      Annotations =          0
                                      Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            5.305 N          The coverage has not been Edited
Dangle  =            0.000 N          since the last BUILD or CLEAN.

                   COVERAGE BOUNDARY

Xmin =               471935.531       Ymin =               395432.094
Xmax =               534104.125       Ymax =               448484.438
```

ITEMS 03/28/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E80-VTLP.BND	ARC051DAT	1	16	XX
DF	E80-VTLP.TIC	ARC052DAT	4	12	XX
DF	E80-VTLP.PAT	ARC054DAT	6041	23	XX

E80-VTLP.PAT
6041 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E80-VTLP#	4	5	B	0		-
13	E80-VTLP-ID	4	5	B	0		-
17	RANGE-CODE	4	5	B	0		-
21	RNGE	3	3	I	-		-

LOG 03/28/90

```
   Date     Time Elap  CPU   I/O  Command
                 min  sec   opr
 -------- ----- ---- ----  ---- ----------------
  7/20/88 17:42  61   622 60990 LATTICEPOLY E80-VTL E80-VTLP RANGE LIDAR2_LKUP
  3/26/90 11:22   0     2    90 EXTERNALALL
  3/27/90  9:34  57   868 44376 export cover E80-VTLP dub1:[pearl.denver]J20-E80-VTLP.e00
```

Description of Coverage: E80-RANGE
Location: DUB0:[DENVER.JAN20.DEV-80]
Summary: E80-RANGE represents Lidar intensities at 9 specific ranges coded as: 30, 60, 95, 125, 160, 190, 225, 250 and > 250. E80-RANGE was dissolved from E80-VTLP based on these nine Lidar intensities.
Coverage Type: Lidar
Feature Type: Polygon
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/2/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E80-RANGE

```
         ARCS                                POLYGONS

Arcs          =        158            Polygons    =         81
Segments      =       8405            Polygon Topology is present.
0    bytes of Arc Attribute Data      19   bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =         81            Tics        =          4
                                      Annotations =          0
                                      Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =             5.305 N         The coverage has not been Edited
Dangle  =             0.000 N         since the last BUILD or CLEAN.

                    COVERAGE BOUNDARY

Xmin =                472184.219      Ymin =                395432.094
Xmax =                533855.438      Ymax =                448484.438
```

ITEMS 03/28/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E80-RANGE.PAT	ARC043DAT	81	19	XX
DF	E80-RANGE.BND	ARC044DAT	1	16	XX
DF	E80-RANGE.TIC	ARC046DAT	4	12	XX

E80-RANGE.PAT
81 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	E80-RANGE#	4	5	B	0		-
13	E80-RANGE-ID	4	5	B	0		-
17	RNGE	3	3	I	-		-

LOG 03/28/90

```
   Date     Time Elap  CPU   I/O  Command
                 min  sec   opr
 -------- ----- ---- ----  ---- ----------------
  8/31/88 17:41  92   448 70332 DISSOLVE E80-VTLP E80-RANGE RNGE
  3/26/90 11:21   0     2    90 EXTERNALALL
  3/27/90       8:26          2              51       2660    export    cover    E80-RANGE
dub1:[pearl.denver]J20-E80-RANGE.e00
```

Description of Coverage: E80-DEMOTIN
Location: DUB0:[DENVER.JAN20.DEV-80]
Summary: A coverage which represents the TIN structure of E80-VT. The DBC demo uses this coverage for display purposes.
Coverage Type: Lidar
Feature Type: Line
Average RMS error: N/A
Input Scale: N/A
Date Produced: 10/28/88

DESCRIPTION OF SINGLE PRECISION COVERAGE E80-DEMOTIN

ARCS		POLYGONS	
Arcs =	821	Polygons =	0
Segments =	821	There is NO Polygon Topology.	
56 bytes of Arc Attribute Data		0 bytes of Polygon Attribute Data	

POINTS		SECONDARY FEATURES	
Label Points =	0	Tics =	4
		Annotations =	0
		Links =	0

TOLERANCES		STATUS
Fuzzy =	5.284 N	The coverage has not been Edited
Dangle =	0.000 N	since the last BUILD or CLEAN.

COVERAGE BOUNDARY

Xmin =	471935.531	Ymin =	395432.094
Xmax =	533855.438	Ymax =	448272.219

ITEMS 03/28/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	E80-DEMOTIN.BND	ARC040DAT	1	16	XX
DF	E80-DEMOTIN.TIC	ARC042DAT	4	12	XX
DF	E80-DEMOTIN.AAT	ARC047DAT	821	56	XX

E80-DEMOTIN.AAT
821 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	FNODE#	4	5	B	0		-
5	TNODE#	4	5	B	0		-
9	LPOLY#	4	5	B	0		-
13	RPOLY#	4	5	B	0		-
17	LENGTH	4	12	F	3		-
21	E80-DEMOTIN#	4	5	B	0		-
25	E80-DEMOTIN-ID	4	5	B	0		-
29	PERCENT_SLOPE	4	12	F	3		-
33	LSLOPE	4	12	F	3		-
37	RSLOPE	4	12	F	3		-
41	LASPECT	4	12	F	3		-
45	RASPECT	4	12	F	3		-
49	ZFROM	4	12	F	3		-
53	ZTO	4	12	F	3		-

LOG 03/28/90

Date	Time	Elap min	CPU sec	I/O opr	Command

```
-------- ----- ---- ----  ---- -----------------
10/28/88 10:10   1    15   973 TINARC E80-VT E80-DEMOTIN LINE PERCENT
```

V. FLT (January 20, Transect Flight Lines)

Description of Coverage: FLIGHT_DBC-U
Location: DUB0:[DENVER.JAN20.FLT]
Summary: Transect flight lines which were used in the interpolation of Lidar surfaces for the January 20, 1988 mission. Mission coordinates were used to generate the flight lines.
Coverage Type: Lidar
Feature Type: Line
Average RMS error: N/A
Input Scale: N/A
Date Produced: 9/21/88

DESCRIPTION OF SINGLE PRECISION COVERAGE FLIGHT_DBC-U

ARCS		POLYGONS	
Arcs	= 11	Polygons	= 0
Segments	= 3904	There is NO Polygon Topology.	
49 bytes of Arc Attribute Data		0 bytes of Polygon Attribute Data	

POINTS		SECONDARY FEATURES	
Label Points	= 205	Tics	= 4
20 bytes of Attribute Data/Point		Annotations	= 14
		Links	= 0

TOLERANCES		STATUS
Fuzzy =	5.313 N	The coverage has not been Edited
Dangle =	0.000 N	since the last BUILD or CLEAN.

COVERAGE BOUNDARY

Xmin =	469185.281	Ymin =	395361.500
Xmax =	534244.250	Ymax =	448486.500

ITEMS 03/28/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	FLIGHT_DBC-U.AAT	ARC030DAT	11	49	XX
DF	FLIGHT_DBC-U.TXT	ARC034DAT	14	404	
DF	FLIGHT_DBC-U.PAT	ARC035DAT	205	20	XX
DF	FLIGHT_DBC-U.BND	ARC036DAT	1	16	XX
DF	FLIGHT_DBC-U.TIC	ARC037DAT	4	12	XX

FLIGHT_DBC-U.AAT
11 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	FNODE#	4	5	B	0		-
5	TNODE#	4	5	B	0		-
9	LPOLY#	4	5	B	0		-
13	RPOLY#	4	5	B	0		-
17	LENGTH	4	12	F	3		-
21	FLIGHT_DBC-U#	4	5	B	0		-
25	FLIGHT_DBC-U-ID	4	5	B	0		-
29	TIN_FLAG	3	3	I	-		-
32	FLIGHT	3	3	I	-		-
35	TAPE	5	5	C	-		-
40	START.TIME	5	5	N	2		-
45	END.TIME	5	5	N	2		-

FLIGHT_DBC-U Continued...

LOG 03/28/90

```
   Date     Time Elap  CPU   I/O  Command
                  min  sec   opr
 -------- ----- ---- ----  ---- ----------------
  7/20/88 14:46   0     3   213 CREATE FLIGHT_DBC-U
  9/21/88 14:10   1    13   713 BUILD FLIGHT_DBC-U LINE
  9/21/88 14:15   1     5   264 UNLOADANNO FLIGHT_DBC-U
  9/21/88 14:17   0     2   164 LOADANNO FLIGHT_DBC-U
  9/21/88 14:20   0     2   161 LOADANNO FLIGHT_DBC-U
  9/21/88 14:22   0     2   152 LOADANNO FLIGHT_DBC-U
  3/26/90 11:35   0     2   108 externalall
  3/27/90       9:43          2            39      2034   export   cover   FLIGHT_DBC-U
dub1:[pearl.denver]J20-FLIGHT_DBC-U.e00
```

Description of Coverage: FLIGHT_UTM
Location: DUB0:[DENVER.JAN20.FLT]
Summary: January 20, 1988 mission transect flight lines. Coordinates taken at time of mission were used to generate this coverage.
Coverage Type: Lidar
Feature Type: Lines
Average RMS error: N/A
Input Scale: N/A
Date Produced: 10/18/88

DESCRIPTION OF SINGLE PRECISION COVERAGE FLIGHT_UTM

ARCS		POLYGONS	
Arcs =	18	Polygons =	0
Segments =	6397	There is NO Polygon Topology.	
46 bytes of Arc Attribute Data		0 bytes of Polygon Attribute Data	

POINTS		SECONDARY FEATURES	
Label Points =	0	Tics =	4
		Annotations =	45
		Links =	0

TOLERANCES		STATUS
Fuzzy =	7.088 N	The coverage has not been Edited
Dangle =	0.000 N	since the last BUILD or CLEAN.

COVERAGE BOUNDARY

Xmin =	469185.281	Ymin =	377606.500
Xmax =	534244.250	Ymax =	448486.500

ITEMS 03/28/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	FLIGHT_UTM.TXT	ARC029DAT	0	404	
DF	FLIGHT_UTM.AAT	ARC031DAT	18	46	XX
DF	FLIGHT_UTM.BND	ARC032DAT	1	16	XX
DF	FLIGHT_UTM.TIC	ARC033DAT	4	12	XX

FLIGHT_UTM.AAT
18 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	FNODE#	4	5	B	0		-
5	TNODE#	4	5	B	0		-
9	LPOLY#	4	5	B	0		-
13	RPOLY#	4	5	B	0		-
17	LENGTH	4	12	F	3		-
21	FLIGHT_UTM#	4	5	B	0		-
25	FLIGHT_UTM-ID	4	5	B	0		-
29	FLIGHT	3	3	I	-		-
32	TAPE	5	5	C	-		-
37	START.TIME	5	5	N	2		-
42	END.TIME	5	5	N	2		-

FLIGHT_UTM Continued...

LOG 03/28/90

```
   Date     Time Elap  CPU   I/O  Command
                 min  sec   opr
 -------- ----- ---- ----  ---- -----------------
  7/20/88 14:52   0     3   211 CREATE FLIGHT_KMUTM
  7/20/88 14:54   0     4   171 RENAME FLIGHT_KMUTM FLIGHT_UTRM
  7/20/88 14:54   0     3   171 RENAME FLIGHT_UTRM FLIGHT_UTM
 10/18/88 16:54   0     6   637 UNLOADANNO FLIGHT_UTM
  3/26/90 11:35   0     2    87 externalall
  3/27/90       9:45          2              43       2046    export    cover    FLIGHT_UTM
dubl:[pearl.denver]J20-FLIGHT_UTM.e00
```

QUALITY ASSURANCE

Quality assurance consists of GIS coverages representing AIRS and Nephelometer monitoring stations, and hourly AIRS data from 10:00 through 17:00 on January 20, 1988. These coverages were used to calculate data including:

1) Distance from each Lidar shot (30 meters AGL) to each monitoring station.
2) Time of Lidar shot, Lidar backscatter value and respective Air quality measurement for CO, SO2, NO2, and O3.

These information was input to SAS for simple and multiple correlation and regression analysis.

Name of Coverage: AIRS
Location: DISK$USER3:[DENVER.JAN20.QA]
Summary: Atmoshperic Information Retrieval Service montoring stations locations, and hourly measurements for 1/20/88. AIRs geographic coordinates were used to generate locations. AIRS.LKUP contains the air monitoring data and is related to AIRS.PAT by STATION-ID.
Coverage Type: QA
Feature Type: Point
Manuscript RMS error: N/A
Average RMS error: N/A
Input Scale: N/A
Date Produced: 11/1/88

DESCRIPTION OF SINGLE PRECISION COVERAGE AIRS

```
         ARCS                                POLYGONS

Arcs          =          0            Polygons    =          0
Segments      =          0            There is NO Polygon Topology.
0    bytes of Arc Attribute Data       0    bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =         10            Tics        =          4
53   bytes of Attribute Data/Point    Annotations =          0
                                      Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            4.963 N          The coverage has not been Edited
Dangle  =            0.000 N          since the last BUILD or CLEAN.

                     COVERAGE BOUNDARY

Xmin =               477219.000       Ymin =               379393.000
Xmax =               513595.000       Ymax =               429024.000
```

ITEMS 03/29/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	AIRS.TIC	ARC000DAT	4	12	XX
DF	AIRS.BND	ARC001DAT	1	16	XX
DF	AIRS.LKUP	arc003DAT	10	186	

DF AIRS.PAT	ARC004DAT	10	53	XX

AIRS Continued...

AIRS.PAT
10 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	AIRS#	4	5	B	0		-
13	AIRS-ID	4	5	B	0		-
17	X-COORD	4	12	F	3		-
21	Y-COORD	4	12	F	3		-
25	NAME	15	15	C	-		-
40	SITE-ID	11	11	C	-		-
51	SYMBOL	3	3	I	-		-
	** REDEFINED ITEMS **						
25	ALL	26	26	C	-		-

AIRS.LKUP 3/29/1990
10 Records Selected.

COL	ITEM NAME	WDTH	OPUT	TYP	N.DEC	ALTERNATE NAME
1	NAME	15	15	C	-	1/20/88
16	SITE-ID	11	11	C	-	
27	SO2-10	5	5	N	3	
32	SO2-11	5	5	N	3	
37	SO2-12	5	5	N	3	
42	SO2-13	5	5	N	3	
47	SO2-14	5	5	N	3	
52	SO2-15	5	5	N	3	
57	SO2-16	5	5	N	3	
62	SO2-17	5	5	N	3	
67	NO2-10	5	5	N	3	
72	NO2-11	5	5	N	3	
77	NO2-12	5	5	N	3	
82	NO2-13	5	5	N	3	
87	NO2-14	5	5	N	3	
92	NO2-15	5	5	N	3	
97	NO2-16	5	5	N	3	
102	NO2-17	5	5	N	3	
107	CO-10	5	5	N	3	
112	CO-11	5	5	N	3	
117	CO-12	5	5	N	3	
122	CO-13	5	5	N	3	
127	CO-14	5	5	N	3	
132	CO-15	5	5	N	3	
137	CO-16	5	5	N	3	
142	CO-17	5	5	N	3	
147	O3-10	5	5	N	3	
152	O3-11	5	5	N	3	
157	O3-12	5	5	N	3	
162	O3-13	5	5	N	3	
167	O3-14	5	5	N	3	
172	O3-15	5	5	N	3	
177	O3-16	5	5	N	3	
182	O3-17	5	5	N	3	
	** REDEFINED ITEMS **					
1	ALL	26	26	C	-	

LOG 03/29/90

Date	Time	Elap min	CPU sec	I/O opr	Command
10/13/88	10:22	1	8	795	generate stations

```
10/13/88 10:23   1     9   594 build stations point
11/ 1/88 14:47   1    12   665 ADDXY STATIONS
 3/29/90 10:57   0     4   186 RENAME STATIONS AIRS
```

Name of INFO File: DIST-NEPHVIP20
Location: DUB0:[DENVER.JAN20.QA.INFO]
Summary: A file comprised of distances from each (VIP) Lidar shot (30 meters agl) for 1/20/88 mission and each NEPHELOMETER monitoring station. VIP were interpolated Lidar shots derived from the ARC/INFO coverage E30-VIP.
Coverage Type: QA
Feature Type: INFO Data File
Average RMS error: N/A
Input Scale: N/A
Date Produced: 3/1/88

DESCRIPTION OF INFO FILE DIST-NEPHVIP20

LIDAR is the value of each shot recorded in backscatter units. XCOORD and YCOORD contain the geographic location of each Lidar shot. STAT1 through 6 were distances (meters) from each Lidar shot to each Nephelometer monitoring stations. The name of each monitoring station appears below.

6744 RECORD(S) SELECTED

DATAFILE NAME: DIST-NEPHVIP20 3/29/1990
11 ITEMS: STARTING IN POSITION 1

COL	ITEM NAME	WDTH	OPUT	TYP	N.DEC	ALTERNATE NAME
1	VIP-TIME-ID	4	5	B	0	
5	RECNO	4	4	I	-	
9	LIDAR	4	4	I	-	
13	XCOORD	10	10	N	1	
23	YCOORD	10	10	N	1	
33	STAT1	10	10	N	1	AURARIA
43	STAT2	10	10	N	1	FEDERAL
53	STAT3	10	10	N	1	PLAZA
63	STAT4	10	10	N	1	TOWER
73	STAT5	10	10	N	1	WELBY
83	STAT6	10	10	N	1	BRIGHTON
	** REDEFINED ITEMS **					
5	ALL	200	200	C	-	

Name of INFO File: DIST-RAW20JAN
Location: DUB0:[DENVER.JAN20.QA.INFO]
Summary: A file comprised of distances from each Lidar shot (30 meters agl) for 1/20/88 mission and each AIRs monitoring station.
Coverage Type: QA
Feature Type: INFO Data File
Average RMS error: N/A
Input Scale: N/A
Date Produced: 3/1/88

DESCRIPTION OF INFO FILE DIST-RAW20JAN

LIDAR is the value of each shot recorded in backscatter units. XCOORD and YCOORD contain the geographic location of each Lidar shot. STAT1 through 10 were distances (meters) from each Lidar shot to each AIRS monitoring stations. The name of each monitoring station appears below.

6471 RECORD(S) SELECTED

DATAFILE NAME: DIST-RAW20JAN 3/29/1990
15 ITEMS: STARTING IN POSITION 1

COL	ITEM NAME	WDTH	OPUT	TYP	N.DEC	ALTERNATE NAME
1	JAN20-FLIGHTS-ID	4	5	B	0	
5	RECNO	4	4	I	-	
9	LIDAR	4	4	I	-	
13	XCOORD	10	10	N	1	
23	YCOORD	10	10	N	1	
33	STAT1	10	10	N	1	WELBY
43	STAT2	10	10	N	1	MYLAND RESERVIOR
53	STAT3	10	10	N	1	AURORA
63	STAT4	10	10	N	1	BOULDER
73	STAT5	10	10	N	1	CAMP
83	STAT6	10	10	N	1	RJH
93	STAT7	10	10	N	1	CARRIAGE
103	STAT8	10	10	N	1	ARVADA
113	STAT9	10	10	N	1	AURARIA
123	STAT10	10	10	N	1	PALMER
	** REDEFINED ITEMS **					
5	ALL	200	200	C	-	

Name of INFO File: DIST-VIP20JAN
Location: DUB0:[DENVER.JAN20.QA.INFO]
Summary: A file comprised of distances from each (VIP) Lidar shot (30 meters agl) for 1/20/88 mission and each AIRs monitoring station. VIP were interpolated Lidar shots derived from the ARC/INFO coverage E30-VIP.
Coverage Type: QA
Feature Type: INFO Data File
Average RMS error: N/A
Input Scale: N/A
Date Produced: 3/1/88

DESCRIPTION OF INFO FILE DIST-VIP20JAN

LIDAR is the value of each shot recorded in backscatter units. XCOORD and YCOORD contain the geographic location of each Lidar shot. STAT1 through 10 were distances (meters) from each Lidar shot to each AIRS monitoring stations. The name of each monitoring station appears below.

6744 RECORD(S) SELECTED

DATAFILE NAME: DIST-VIP20JAN 3/29/1990
15 ITEMS: STARTING IN POSITION 1

COL	ITEM NAME	WDTH	OPUT	TYP	N.DEC	ALTERNATE NAME
1	VIP-TIME-ID	4	5	B	0	
5	RECNO	4	4	I	-	
9	LIDAR	4	4	I	-	
13	XCOORD	10	10	N	1	
23	YCOORD	10	10	N	1	
33	STAT1	10	10	N	1	WELBY
43	STAT2	10	10	N	1	MYLAND RESERVIOR
53	STAT3	10	10	N	1	AURORA
63	STAT4	10	10	N	1	BOULDER
73	STAT5	10	10	N	1	CAMP
83	STAT6	10	10	N	1	RJH
93	STAT7	10	10	N	1	CARRIAGE
103	STAT8	10	10	N	1	ARVADA
113	STAT9	10	10	N	1	AURARIA
123	STAT10	10	10	N	1	PALMER
	** REDEFINED ITEMS **					
5	ALL	200	200	C	-	

Name of INFO File: FLIGHT_INFO
Location: DUB0:[DENVER.JAN20.QA.INFO]
Summary: A file comprised of distances from each Lidar shot (30 meters agl) for 1/20/88 mission and each AIRs monitoring station.
Coverage Type: QA
Feature Type: INFO Data File
Average RMS error: N/A
Input Scale: N/A
Date Produced: 3/1/88

DESCRIPTION OF INFO FILE DIST-RAW20JAN

DIST-RAW20JAN is an INFO file containing information for each Denver Lidar mission flown by EMSL-LV. TAPE contains the datafile name, DATE stores the mission date, FLIGHT contains the transect number and transect times are stored in items START and END.

58 RECORD(S) SELECTED

DATAFILE NAME: FLIGHT_INFO 3/29/1990
5 ITEMS: STARTING IN POSITION 1

COL	ITEM NAME	WDTH	OPUT	TYP	N.DEC	ALTERNATE NAME
1	TAPE	4	4	C	-	
5	DATE	7	7	C	-	
12	FLIGHT	2	2	I	-	
14	START	5	5	N	2	
19	END	5	5	N	2	

Name of Coverage: NEPHAL
Location: DISK$USER3:[DENVER.JAN20.QA]
Summary: Nephelometer monitoring station locations. Locations were generated from locations received from EMSL-LV AMD / AIRS group.
Coverage Type: QA
Feature Type: Point
Average RMS error: N/A
Input Scale: N/A
Date Produced: 1/18/89

DESCRIPTION OF SINGLE PRECISION COVERAGE NEPHAL

```
         ARCS                                POLYGONS

Arcs          =          0            Polygons    =          0
Segments      =          0            There is NO Polygon Topology.
0    bytes of Arc Attribute Data       0    bytes of Polygon Attribute Data

         POINTS                              SECONDARY FEATURES

Label Points  =          6            Tics        =          4
44   bytes of Attribute Data/Point    Annotations =          0
                                      Links       =          0
         TOLERANCES                          STATUS

Fuzzy   =            3.310 N          Coverage has 1 edit mask(s), use
Dangle  =            0.000 N          BUILD or CLEAN to restore topology

                    COVERAGE BOUNDARY

Xmin =               499564.000       Ymin =               399396.000
Xmax =               516075.313       Ymax =               432500.000
```

ITEMS 03/29/90

TYPE	NAME	INTERNAL NAME	NO. RECS	LENGTH	EXTERNL
DF	NEPHAL.BND	ARC002DAT	1	16	XX
DF	NEPHAL.TIC	ARC006DAT	4	12	XX
DF	NEPHAL.PAT	ARC009DAT	6	44	XX

NEPHAL.PAT
6 Records Selected.

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC	ALTERNATE NAME	INDEXED?
1	AREA	4	12	F	3		-
5	PERIMETER	4	12	F	3		-
9	NEPHAL#	4	5	B	0		-
13	NEPHAL-ID	4	5	B	0		-
17	STATION	15	15	C	-		-
32	TIME	5	5	N	2		-
37	X-COORD	4	12	F	3		-
41	Y-COORD	4	12	F	3		-

LOG 03/29/90

Date	Time	Elap min	CPU sec	I/O opr	Command
1/18/89	11:48	0	7	806	GENERATE NEPHALIMETER
1/18/89	11:49	0	2	113	RENAME NEPHALIMETER NEPHAL
1/18/89	14:46	1	11	996	BUILD NEPHAL POINT
1/18/89	15: 6	1	12	632	ADDXY NEPHAL

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NOTICE

Science

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```
3/29/90 11: 9    0      1     70 EXTERNALALL
3/29/90 12:50    1      8    341 EXPORT COVER NEPHAL DUB1:[PEARL.DENVER]QAXNEPHAL.E00
```