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東濃地科学センター 【研究調整グループ】

## 汎用地理情報システムへのMIF変換コンバーター作成

1996年3月

セントラル・コンピュータ・サービス株式会社

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## 汎用地理情報システムへのMIF変換コンバーター作成

馬場 辰男 ※

### 要 旨

世界の地質調査所（日本、米国、カナダ、オーストラリア）や研究機関（オランダ ITC）並びに探鉱会社では、既に汎用の高度な地理情報システム（GIS）を導入し、地図情報を収集・管理している。それらのデータを利用し、ウラン資源賦存のポテンシャルを評価するため、汎用の高度な地理情報システム（GIS）の利用は必要不可欠である。

一方、動燃は、世界のウラン資源に関する地質鉱床学的ポテンシャル解析を目的としたウラン資源ポテンシャル情報解析システム（GIASURA）を開発し、その利用を進めてきている。

汎用的で高度な地理情報システム（GIS）を導入し、高度な解析環境の構築を実現するため、既存のGIASURAのファイルフォーマットであるマップインターフェースファイル（MIF）を、汎用的かつ世界標準のフォーマットであるARC/INFOフォーマットに相互変換するため、調査とコンバーターのプログラム設計、開発を行った。

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## 1 概要

汎用地理情報システムARC/INFOの標準フォーマットと最新機能や稼働環境の調査を行い、動燃事業団内における今後の活用方法を検討する。その検討に従い、ウラン資源ポテンシャル情報解析システム（GIASURA）のデータとの双方向コンバータを開発し、今後の利用を進める。

ARC/INFOフォーマットは米国ESRI社の汎用GISソフトの標準ファイルフォーマットであり、各種GISプログラム間でデータ交換を行う場合の、事実上の世界標準の交換ファイルフォーマットといえる。フォーマットの市場性、将来性を考慮に入れて、MIFとのファイル変換フォーマットを見定めるものである。

またデスクトップGISとして注目を集めているArcView2の機能と操作方法を考慮に入れ、動燃事業団内における今後の活用方法を見定める。

その指針に沿って、GIASURAデータとの双方向コンバータを開発するものである。

## 2 汎用地理情報システムARC/INFOの標準ファイルフォーマットの調査報告書

ARC/INFOの標準フォーマットには、Export、Generate、および内部形式等の種類があり、この中から、データ交換に適したフォーマットを選定する。フォーマットの特性は、下記のようになる。

### ファイルフォーマットの特性

- 内部形式 file : ARC/INFO coverage<sup>\*1</sup> format fileのことで、ARC/INFOのデータファイルそのままであることから、こう呼ばれる。外部には公開されないため、一般データの交換ファイルに採用するのは難しい。
- Export file : ARC/INFO interchange fileのことで、ARC/INFOのデータファイルからEXPORTコマンドで生成することから、こう呼ばれる。このデータファイルをARC/INFOに読み込むためには、IMPORTコマンドを使用する。内部形式を忠実に変換するために、ARC/INFOのバージョンに依存することがあり、やはり一般データの交換ファイルに採用するのは難しい。
- Generate file : ARC/INFOのデータファイルを作り出すGENERATEコマンドの名称にちなんで、こう呼ばれる。GENERATEコマンドによって、座標と属性を入力することにより、ARC/INFO coverage format fileが作れるが、その入力フォーマットを、そのままデータファイルの形式にしている。再度外部交換ファイルを作るのはUNGENERATEコマンドが用意されている。一般データの交換ファイルに採用しやすい。添付資料1 GENERATEコマンドオンラインヘルプを参照されたし。

注 \*1 coverageとは、ARC/INFOソフトウェアの中のデータ管理の基礎的なユニットであり、与えられたエリア中の地図特徴素の位置的情報と主題となるattributes（属性）を定義する。coverageは、一つの地図シートlayer(層)をデジタルで表現したものであり、通常地図の特徴素（roads, parcels, soil units, forest stands等）の一つの型を表現する。coverageの概念は、地理的な情報の位相数学的なモデルに基づいており、データの種々の特徴クラスの型の中に、いくつかのタイプの地理的情報を含む。coverageの中で、地図特徴素は、単純なpoints, arcsまたはpolygonsとしてたくわえられる。これらの特徴素の位置的データは、一連のx, y座標系か、他の特徴素の組合せとして位相数学的に表される。例えば都市の通りは一組の弧による座標系で表され、各通りとして定義したx, y座標の順番のセットとして位置づけることもできるし、各都市ブロックを、その境界を含む通りのセットとして、定義することもできる。

以上の結果から、交換性の容易さ、保守性を考慮に入れると、交換ファイルとしては、Generate fileが望ましいと考えられる。

さらにフォーマットの市場性、将来性を考慮に入れて、MIFとのファイル変換フォーマットを見定めることとする。米国のホームページ検索サービス会社で、ARC/INFOとそれぞれGENERATE FORMAT、EXPORT FORMAT、INTERNAL FORMATをキーワードに、データ提供会社や教育サービスの案内、データ変換プログラム、規格、等の紹介の記事を検索して、

どれくらいのヒット率を得ることができるかで、市場性を評価してみた。検索サービスは、Open Text Index（添付資料2参照）、WebCrawler Search（添付資料3参照）、Yahoo! Search（Yahoo! Searchの検索結果は、Open Text Indexと同じになった。検索エンジンに、Open Textを使用しているためと考えられる。添付資料4参照）の3つを利用してみた。検索条件は、ANDを使用した。尚、最初にARC/INFO DATA FORMATをキーワードにして、母集団を決定してから、さらにキーワードを追加して検索をかけたため、%は、母集団内の中での特定キーワード（GENERATE、EXPORT、INTERNAL）による検索結果の比率を表している。合計が100%ではないので、注意いただきたい。

## フォーマットの市場性

	Open Text Index	WebCrawler Search	Yahoo! Search
ARC/INFO DATA:	2343	209	2343
内部形式 file :	963(41.1%)	55(26.3%)	963(41.1%)
Export file :	584(24.9%)	52(24.9%)	584(24.9%)
Generate file :	800(34.1%)	64(30.6%)	800(34.1%)

以上の結果から、市場性を考慮に入れると、交換ファイルとしては、やはりGenerate fileが望ましいと考えられる。

最後に、将来性の評価を行う。現在、デスクトップGISとして注目を集めているArcView2では、Shapefileというトポロジーを持たないデータ構造を持つフォーマットが採用されている。（添付資料5 ArcView Version2 Shapefile Technical Description参照）この中では、属性データは、dBASEファイルで作成される。（添付資料6 dBASE .DBF File Structure参照）

現在は交換性に乏しい（前述のYahoo! Searchでは、2343件中、Shapeというキーワードを持つホームページは、488件(20.8%)であり、他の交換フォーマット程採用されていない現状がうかがえる。）ものの、将来の作業環境として、PC(Windows,WNT等)では、重要なファイルフォーマットとなると考えられる。将来、PCによる編集、空間分析\*2（Spatial Analysis）作業が多くなる局面では、Shapefileの価値はさらに高まると考えてよい。

今回のGISは、UNIXサーバ上で検討しているため、Shapefileの利用価値はさほどなく、これまでの検討結果通り、Generate fileが望ましいと結論づける。

注 \*2 ARC/INFO系GISには、洗練された地理的モデリングツールと分析の結果のレポートと表示機能がある。効果的な分析の1つに、空間分析がある。

GISで用いるベクトル空間分析ツールには、位相数学的な地図overlay、地図操作、buffer生成と近接分析、polygon分解と排除、空間的な検索と論理的な検索、番地による地図上の位置づけ（address geocoding）、3次元のsurface modeling、network分析等を含む。

デスクトップGISとして注目を集めているArcView2の機能と操作方法を考慮に入れ、ARC/INFOとArcView2によるGISデータの利用方法を検討し、動燃事業団内における今後の活用方法を見定める。

ArcView2は、ARC/INFO coverage format fileを入力し表示できる。PC版ArcView2は、UNIXのcoverageファイルを、DOSファイルに変換して取り込む機能を持っている。表示したデータを編集するには、前述のShape fileに一旦変換することが必要になる。ArcView2の世界では、そのままShape fileで保存、表示、解析可能であるが、ARC/INFOのファイルとして編成する場合は、再度カバレッジに変換しなければならない。これは、SHAPEARCコマンドで行うことができる。以上の関係を、図示する次頁のようなデータの流れになる。

これらの、データの流れを基本にとらえて、今回のGLASURAデータとの双方向コンバータを設計・開発しなければならない。



### 3 MIF変換コンバーターのプログラム設計書

2章において、フォーマットの市場性、将来性を考慮に入れて、MIFとのファイル変換フォーマットを決定した。さらにデスクトップGISとして注目を集めているArcView2の機能と操作方法を考慮に入れ、ARC/INFOとArcView2によるGISデータの利用方法を検討した。これら指針に沿って、GIASURAデータとの双方向コンバータを設計した。

- ① MIF項目とARC/INFO Generateファイルフォーマット項目のマッチングを図った。MIF項目内の名称（Layer Name、Segment Name、Attribute Name）は英語を対象とした。MIF項目で、Generateファイルフォーマット項目にマッチングしないものは、MIFからARC/INFOへの変換時には読み飛ばし、逆に戻すときには、画面から入力できるものとした。次頁より、対応表を記述する。

MIF データ項目			ARC/INFO データ項目		
キー	フィールド	内容	要/不要	行先	備考
Frame	レイヤー名称	128 文字以内の文字列 (漢字含む)	△	Coverage名	日本語化されるまでは、英数字のみ。 Generateファイルでとどめる場合は不要。
	レイヤー形式	HIPLANEのみ	×	-	
Comment		以下の項目の合計が 1024 文字以内 データ項目区切り文字は":"			
	エリア名		×	-	
	レイヤー名		×	-	
	国名		×	-	
	プロジェクト名		×	-	
	原図面名		×	-	
	原図面の作成日付		×	-	
	原図面の縮尺		×	-	
SW	緯度	カバー範囲南西端の緯度	×	-	
	経度	カバー範囲南西端の経度	×	-	
NE	緯度	カバー範囲北東端の緯度	×	-	
	経度	カバー範囲北東端の経度	×	-	
Left	開始緯度	未使用	×	-	
	開始経度	未使用	×	-	
Right	終了緯度	未使用	×	-	
	終了経度	未使用	×	-	
Level	下端標高	未使用	×	-	
	上端標高	未使用	×	-	
Projection	投影図法番号	緯度経度 (0) のみサポート	×	-	
	パラメータ	なし	×	-	

※行先

GEN: Generate File  
 ATTR: Attribute File  
 INFO: INFO File

キー	フィールド	内容	要/不要	行先	用途
Segment	Type	Point	△	-	Coverageを直接作成する場合にGenerateコマンド実行時に必要
	セグメント数		×	-	
	属性種類数		×	-	
Geometry	セグメントID	1以上の10進整数	○	GEN	GenerateファイルとAttributeファイルをJoinさせるキー
	セグメント名		×	-	
	修正フラグ		×	-	
	X	DegreeまたはKmをNumber型で表す 小数点位置の指定はない	○	GEN	
	Y	DegreeまたはKmをNumber型で表す 小数点位置の指定はない	○	GEN	
Attribute	属性番号		△	-	ATTR作成時に属性種類名と値の対応付けに使用
	属性種類名		○	ATTR	
	単位		×	-	
	型	Char または Number のみ	○	INFO	Coverageを直接作成する場合はINFOファイル定義に必要な Generateファイルでとどまる場合は不要
	制約条件	Scalar のみ	×	-	
	下限値		×	-	
	上限値		×	-	
Value	セグメントID		○	ATTR	Coverage名-IDの名称でINFOファイルのフィールドを作成 Generateファイルでとどまる場合はfile-ID
	修正フラグ		×	-	
	値1～n		○	ATTR	

※行先

- GEN: Generate File
- ATTR: Attribute File
- INFO: INFO File

キー	フィールド	内容	要/不要	行先	用途
Segment	Type	Line	△	-	Coverageを直接作成する場合にGenerateコマンド実行時に必要
	セグメント数		×	-	
	属性種類数		×	-	
Geometry	セグメントID	1以上の10進整数	○	GEN	GenerateファイルとAttributeファイルをJoinさせるキー
	セグメント名		×	-	
	修正フラグ		×	-	
	点列数		×	-	
	X	DegreeまたはKmをNumber型で表す 小数点位置の指定はない	○	GEN	
	Y	DegreeまたはKmをNumber型で表す 小数点位置の指定はない	○	GEN	
Attribute	属性番号		△	-	ATTR作成時に属性種類名と値の対応付けに使用
	属性種類名		○	ATTR	
	単位		×	-	
	型	Char or Number	○	INFO	Coverageを直接作成する場合はINFOファイル定義に必要な Generateファイルでとどまる場合は不要
	制約条件	Scalar	×	-	
	下限値		×	-	
	上限値		×	-	
	Value	セグメントID		○	ATTR
修正フラグ			×	-	
値1～n			○	ATTR	

## ※行先

GEN: Generate File

ATTR: Attribute File

INFO: INFO File

キー	フィールド	内容	要/不要	行先	用途
Segment	Type	Poly	△	-	Coverageを直接作成する場合にGenerateコマンド実行時に必要
	セグメント数		×	-	
	属性種類数		×	-	
Geometry	セグメントID	1以上の10進整数	○	GEN	GenerateファイルとAttributeファイルをJoinさせるキー
	セグメント名		×	-	
	修正フラグ		×	-	
	Line数		×	-	
	LineのセグメントID 1～n		×	-	
	X	DegreeまたはKmをNumber型で表す 小数点位置の指定はない	○	GEN	Lineのセグメントから取得
	Y	DegreeまたはKmをNumber型で表す 小数点位置の指定はない	○	GEN	Lineのセグメントから取得
Attribute	属性番号		△	-	ATTR作成時に属性種類名と値の対応付けに使用
	属性種類名		○	ATTR	
	単位		×	-	
	型	Char or Number	○	INFO	Coverageを直接作成する場合はINFOファイル定義に必要な Generateファイルでとどまる場合は不要
	制約条件	Scalar	×	-	
	下限値		×	-	
	上限値		×	-	
Value	セグメントID		○	ATTR	Coverage名-IDの名称でINFOファイルのフィールドを作成 Generateファイルでとどまる場合はfile-ID
	修正フラグ		×	-	
	値 1～n		○	ATTR	

## ※行先

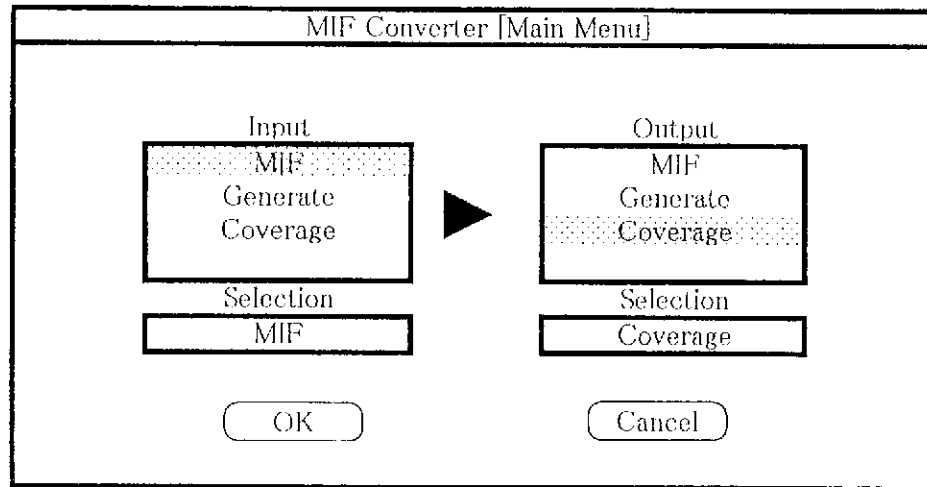
GEN: Generate File  
 ATTR: Attribute File  
 INFO: INFO File

## ※注意

点列のデータは'Segment Line'のデータから取得しなければならない。  
 また、LineのAttribute, Valueは無視し、PolyのAttribute, Valueを使用すること。

- ② MIFコンバーター画面イメージを設計した。最も多く利用されることが予測されるMIF to Coverage変換、あるいは逆のCoverage to MIF変換は、ユーザにGenerate Fileの生成を意識させずにダイレクトに行う方式とした。外部提供用のGenerate Fileは、Coverageと双方向の変換ができるように考えた。次頁から、画面イメージを記述する。

# 1.メインメニュー



プログラム起動時に表示されるメニュー

Input, Output それぞれのファイルフォーマットを選択し、OKボタンでおのおのの画面に移る。

Input, Output は、単一選択で、現在選択中の内容は、下の Selection ボックス内に表示する。

Inputのデフォルトは、MIF  
Outputのデフォルトは、Coverage

Inputで選択した項目は、Outputでは選択できないようにする。Input, Outputは、次の組合せをサポートする。

Input	Output
MIF	Coverage
Generate	Coverage
	MIF
Coverage	Generate

- OK 現在選択中の組み合わせのコンバート画面へ
- Cancel 本プログラムの終了

## 2.MIF to Coverage コンバーター画面

MIF Converter [MIF to Coverage]

Input MIF: /home12/giasura/mifdata

List

- > ..
- > info
- > home1
- > foo
- test1.mif
- test2.mif

Filter \*.mif

Selection test1.mif

Output Coverage File: /home12/viewpoint/cov\_dat

List

- > ..
- > info
- > home13
- > foo

Filter \*.\*

Selection

OK Cancel

選択したMIFをCoverage Fileに変換する画面

●Input MIF,Output Coverage File Directoryの表示。入力。

●List Directoryの内容を表示。

●Filter Directoryに表示するデータのフィルタを入力。

●Selection Listで選択されたファイルを表示。入力。

●OK  
コンバート開始。終了後メインメニューに戻る。  
なお、MIFデータの属性・typeは次のルールで自動的に設定する。

(ルール)

- ・CHAR 最長のものを選択
- ・NUMBER 小数点がないければ、Integer  
小数点があれば、小数部の最大桁数と整数部の最大桁数を求め、その合成による長さおよびDecimal Placeを採用する。

●Cancel  
メインメニューに戻る。

### 3.Generate to Coverage コンバーター画面

MIP Converter [Generate to Coverage]

Coverage Type:  Point  Line  Polygon

Input Generate File: /home12/viewpoint/generic.dat  
 List  
 -> ..  
 > info  
 -> home1  
 -> foo  
 test1.gen  
 test2.gen

Filter: \*.gen  
 Selection: test1.gen

Attribute File Format:  dBASE File  Delimited Text File  INFO File  Formated Text File

Input Attribute File: /home12/viewpoint/generic.dat  
 List  
 -> ..  
 -> info  
 -> home1  
 -> foo  
 test1.txt  
 test2.txt

Filter: \*.txt  
 Selection: test1.txt

Output Coverage File: /home12/viewpoint/cov.dat  
 List  
 -> ..  
 -> info  
 -> home13  
 -> foo

Filter: \*.\*  
 Selection:

OK... Cancel

●Coverage Type:  
Point/Line/Polygonから選択

●Input Generate File,Input  
Attribute File,Output Coverage  
File Directoryの表示・入力。

●List  
Directoryの内容を表示。

●Filter  
Directoryに表示するデータ  
Attribute File のファイル形式を  
のフィルタを入力。

●Selection  
Listで選択されたファイルを表示。

●Attribute File Format  
Attribute File のファイル形式を  
指定。

●OK  
Attribute Define Dialog を表示する。

●Cancel  
メインメニューに戻る。

Attribute Define Dialog

● Define...  
Define Dialogの表示。

● Clear  
Format Blockに表示しているデータのクリア

● OK  
ID Attribute Dialogへ

● Cancel  
Generate to Coverage画面へ

下の“Data Sample”セクションには、Sampleが表示され、Defineで定義した値は、“Format Block”に表示される。

15

Define Dialog

● Name  
設定するBlockの名称。入力可。

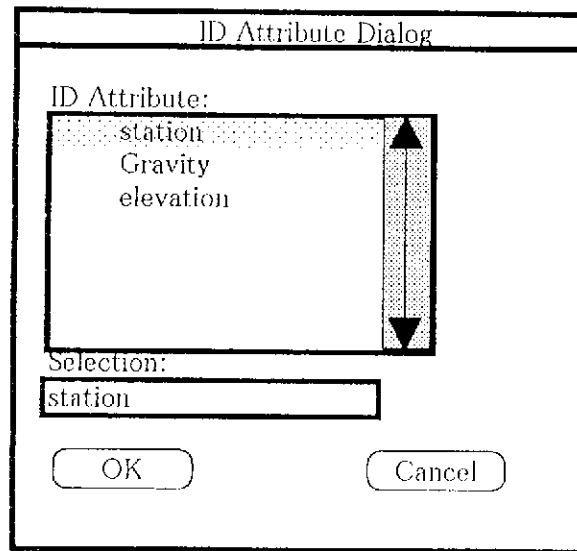
● Type  
CHAR/NUMBER/INTEGER/BINARYから選択。

● Internal Width/Output Width /Decimal Places  
各々入力。

● Next...  
次の設定するBlockへ

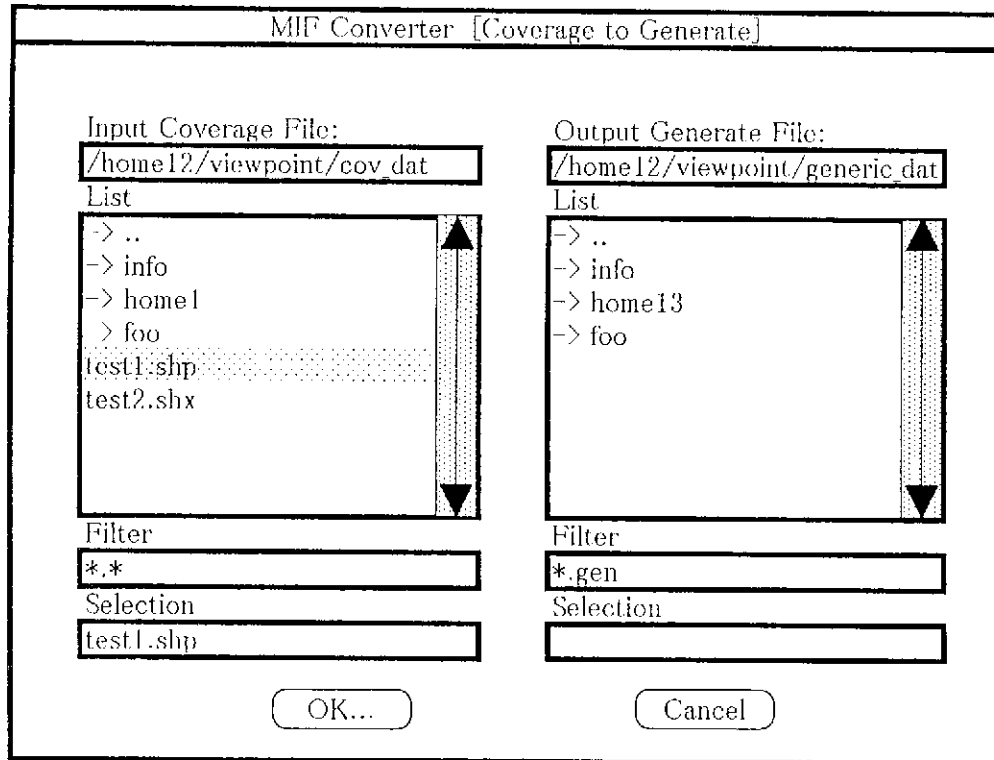
● Done  
終了して、Attribute Define Dialogへ

## ID Attribute Dialog



- ID Attribute  
リストから単一選択。
- Selection  
Listで選択されたデータ項目名を表示。
- OK  
コンバート開始。終了後、メインメニューへ
- Cancel  
Attribute Define Dialogへ

#### 4.Coverage to Generate コンバーター画面



選択したCoverage Fileを Generate File に変換する画面

●Input Coverage File,Output Generate File Directoryの表示・入力。

●List Directoryの内容を表示。

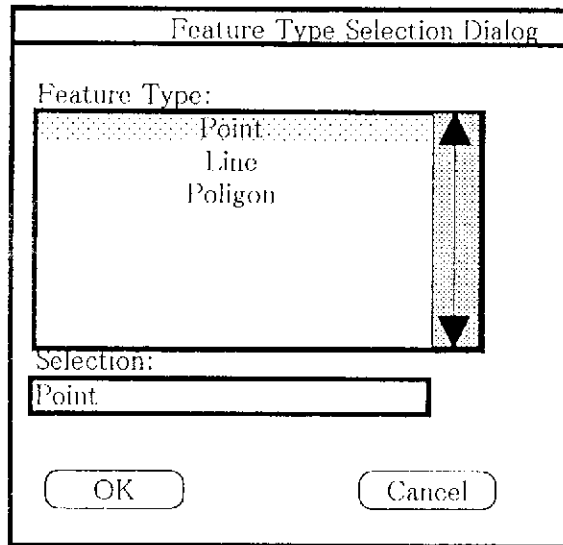
●Filter Directoryに表示するデータのフィルタを入力。

●Selection Listで選択されたファイルを表示。入力。

●OK Feature Type Selection Dialog 画面へ

●Cancel メインメニューに戻る。

Feature Type Selection Dialog



- Feature Type  
リストから単一選択。デフォルトは先頭を選択。
  - Selection  
Listで選択されたデータ項目名を表示。
  - OK  
コンバート開始。終了後、メインメニューへ
  - Cancel  
Coverage to Generate 画面へ
- ※Feature Type が一つでも、表示する。

## 5.Coverage to MIF コンバーター画面

MIF Converter [Coverage to MIF]

<p>Input Coverage File: /home12/viewpoint/cov.dat</p> <p>List</p> <ul style="list-style-type: none"><li>-&gt; ..</li><li>-&gt; info</li><li>-&gt; home1</li><li>-&gt; foo</li><li>test1.shp</li><li>test2.shx</li></ul> <p>Filter *,*</p> <p>Selection test1.shp</p> <p>OK...</p>	<p>Output MIF: /home12/giasura/mifdata</p> <p>List</p> <ul style="list-style-type: none"><li>-&gt; ..</li><li>-&gt; info</li><li>-&gt; home13</li><li>-&gt; foo</li><li>test1.mif</li><li>test2.mif</li></ul> <p>Filter *.mif</p> <p>Selection</p> <p>Cancel</p>
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

選択したCoverage FileをMIFに変換する画面

●Input Coverage File,Output MIF Directoryの表示・入力。

●List Directoryの内容を表示。

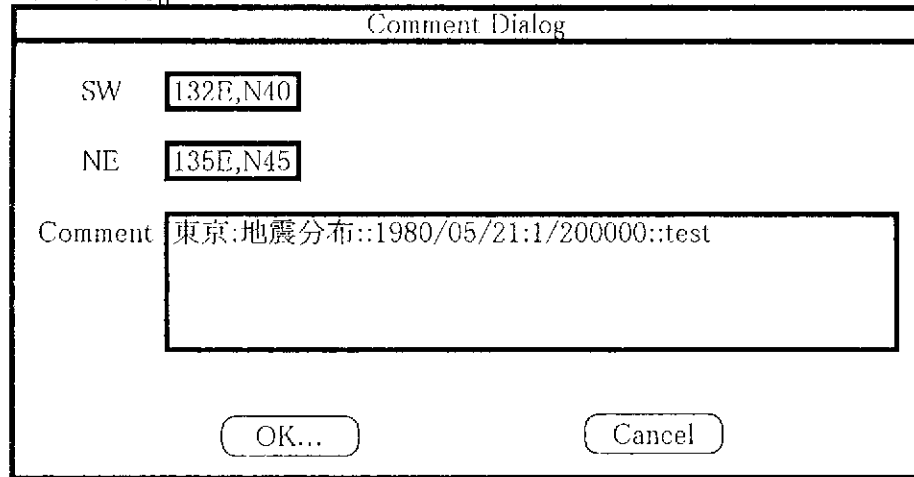
●Filter Directoryに表示するデータのフィルタを入力。

●Selection Listで選択されたファイルを表示。入力。

●OK Comment Dialog表示

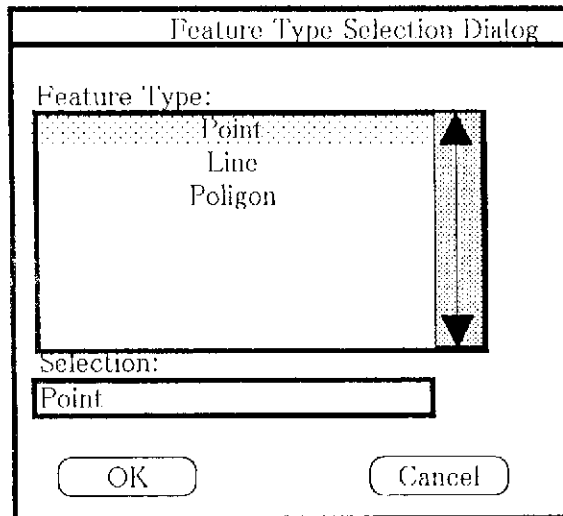
●Cancel メインメニューに戻る。

Comment Dialog



- SW  
算出し表示。入力不可
- NE  
算出し表示。入力不可
- Comment  
入力例を表示。上書きするかたちで入力する。
- OK  
Feature Type Selection Dialog 画面へ
- Cancel  
Coverage to MII画面へ

Feature Type Selection Dialog



- Feature Type  
リストから単一選択。デフォルトは先頭を選択。
  - Selection  
Listで選択されたデータ項目名を表示。
  - OK  
コンバート開始。終了後、メインメニューへ
  - Cancel  
Coverage to Generate 画面へ
- ※Feature Type が一つでも、表示する。

## 4. MIF変換コンバータ取り扱い説明書

マップインターフェースファイル (MIF) 変換コンバータは、将来の汎用地理情報システム (GIS) 導入を考慮し、HP9000/700 series UNIX 上で稼働させる。

### 4.1 起動方法

UNIX に login 後、mifconv とタイプしリターンキーを押すと、MIFConverter が起動し Main Menu が表示される。

### 4.2 終了方法

MIFConverter Main Menu で Cancel ボタンをクリックすると、MIFConverter は終了する。

### 変換方法

MIFConverter Main Menu で、MIF to Coverage, Generate to Coverage, Coverage to MIF, Coverage to Generate の4つの変換メニューを選択できる。変換データ選択画面では、セレクションボックスにより MIF や ARC/Info Coverage を選択できる。各変換メニューの画面イメージと操作について次頁より記述する。

### 4.3 Main Menu

プログラム起動時表示画面 (図1 参照)

MIF Converter Main Menu

Input Format:

- MIF
- Generate
- Coverage

Selection: MIF

Output Format:

- Coverage

Selection: Coverage

Attribute Name Conversion Table

OK Cancel

図1. Main Menu

#### 操作方法

1. Input Format リストボックスに表示中の MIF, Generate, Coverage の中から、変換元のファイル形式をクリックして選択すると、Input Format リストボックスの下にある Selection ボックスに選択したファイル形式が表示される。起動直後は、Selection ボックスには MIF が表示されている。
2. 変換元のファイル形式に対応して、選択可能なファイル形式が Output Format リストボックスに表示される。また、Output Format リストボックスの先頭に表示されたファイル形式は反転表示され、Selection ボックスに表示される。Output Format リストボックスからファイル形式を選択すると、反転表示され、Selection ボックスに表示される。
3. OK ボタンをクリックすると、個々のファイルの選択や、設定の為の変換メニュー画面が表示される。
4. 変換が終了すると、この Main Menu に戻るのので、他に変換するファイルがあれば、1 から同様の操作を行う。
5. 本プログラムを終了する場合、Cancel ボタンをクリックして終了する。(この Main Menu の Cancel ボタンをクリックする以外、プログラムを終了することはない)
6. Attribute Name Conversion Table ボタンをクリックすると、MIF Attribute Name Table Viewer が起動する (図3 参照)。MIF Attribute Name Table Viewer の詳細は、4.4.1 MIF to Coverage を参照。

#### 4.4 各変換メニュー

##### 4.4.1 MIF to Coverage

MIF Fileを Coverage に変換する画面。(図2参照)

MIF Converter	
MIF to Coverage	
Input MIF File: /home/giasura/mifdata	Output Coverage: /home/vpoint/arc/data
-> .. test1.mif test2.mif test3.mif test4.mif	-> .. -> cover -> genfile
Filter *.mif	Filter *
Selection: 	Coverage Name: new cover
OK	Cancel

図2. MIF to Coverage

#### 操作方法

1. 左のリストボックスから、変換元 MIF File を選択する。  
ボックス群は、Input, Output, ファイル形式を問わず同じ構成になっている。  
1 番目の入力ボックスには、対象ファイルのあるディレクトリを入力する。  
2 番目のリストボックスには、上の入力ボックスで指定されたディレクトリの中身が表示される。ここをマウスでクリックすることで、ファイルの選択やディレクトリの切り替えが行える。  
3 番目の Filter とある入力ボックスには、\* や ? といったワイルドカードを使って、リストボックスに表示するファイルを絞る為の Filter を入力する。  
4 番目の Selection には、リストボックスで選択されたファイル名が表示される。
2. 右のリストボックスから、変換後 Coverage 格納ディレクトリを指定する。  
Coverage 名はプログラムが自動的に付けるが、明示的に Coverage 名を付けた場合、Coverage Name 入力ボックスに、Coverage 名を入力する。また、既存の Coverage と置き換えたい場合、リストボックスで Coverage を選択すると、選択した Coverage 名で Coverage を作成する。
3. OK ボタンをクリックすると、変換を開始し、変換終了後 MIF Attribute Name Table Viewer が起動する(図3参照)。
4. Cancel ボタンをクリックすると、変換の為の設定を中断して、Main Menu に戻る。

属姓名の長さの規則が、MIF では 64 文字まで、ARC/INFO では 16 文字までと違うために、MIF での属姓名のままでは ARC/INFO ではユニークにならない場合が生じる。そこで、属姓名の変換が必要となり、その変換結果を表示するのが MIF Attribute Name Table Viewer である。

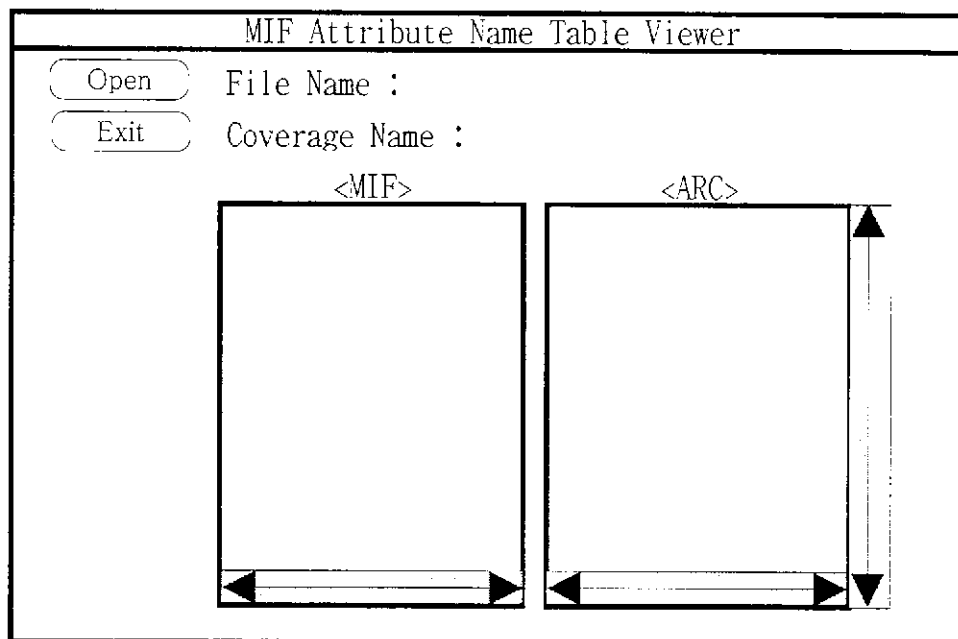


図 3. MIF Attribute Name Table Viewer

MIF to Coverage 終了直後は、MIF to Coverage の対象ファイルの変換結果を表示している。

Open ボタンをクリックすると、Attribute Name Table File 選択用 Dialog Box (図 4 参照) を表示する。

Exit ボタンをクリックすると、MIF Attribute Name Table Viewer を終了して、Main Menu に戻る。

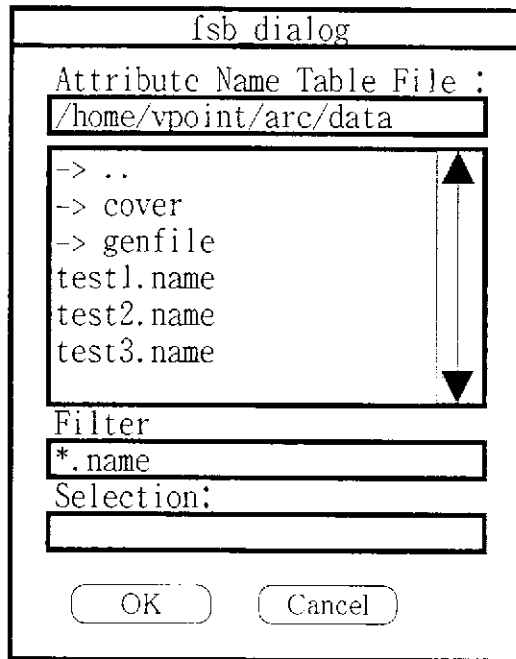


図4. Attribute Name Table File 選択用 Dialog Box

リストボックスから、表示したい Attribute Name Table File を選択する。

OK ボタンをクリックすると、選択した Attribute Name Table File の内容を MIF Attribute Name Table Viewer に表示する。

Cancel ボタンをクリックすると、Attribute Name Table File は選択されず、Open ボタンをクリックする前の状態に戻る。

#### 4. 4. 2 Generate to Coverage

Generate File を Coverage に変換する画面。(図 5 参照)

MIF Converter | Generate to Coverage

Coverage Type:  
 Point  Line  Polygon  Route  Region  Annotation

Route, Region, Annotation Subclass Name

Annotation Level

Annotation Symbol

Generate File:

- > ..
- > cover
- > genfile
- test1.gen
- test2.gen
- test3.gen

Filter

Selection

Attribute File:

- > ..
- > cover
- > genfile
- test1.txt
- test2.txt
- test3.txt

Filter

Selection

Output Coverage:

- > ..
- > cover
- > genfile

Filter

Coverage Name:

Attribute File Format:  
 Delimited Text  Formated Text  dBASE  INFO

OK Cancel!

図 5. Generate to coverage

#### 操作方法

1. Coverage Type を、Point, Line, Polygon, Route, Region, Annotation から選択する。
2. Coverage Type で Route, Region を選択した場合、Subclass Name が必須入力になる。また、Annotation を選択した場合、Subclass Name, Level, Symbol を入力する (必須ではない)。なお、Subclass Name は 11 文字以内で最初の 1 文字目に数字を使用してはいけない。
3. 左のリストボックスから、変換元 Generate File を選択する。各ボックスの操作方法は、4.4.1 MIF to Coverage を参照。
4. Attribute File の Format を、Attribute File Format で、Delimited Text, Formated Text, dBASE, INFO から選択する。
5. 中央のリストボックスから、変換元 Attribute File を選択する。
6. 右のリストボックスから、変換後 Coverage 格納ディレクトリを指定する。Coverage 名はプログラムが自動的に付けるが、明示的に Coverage 名を付けた場合、Coverage Name 入力ボックスに、Coverage 名を入力する。また、既存の Coverage と置き換えたい場合、リストボックスで Coverage を選択すると、選択した Coverage 名で Coverage を作成する。
7. OK ボタンをクリックすると、変換元ファイルの Attribute を設定する Attribute File Format を表示する。(図 6 参照)
8. Cancel ボタンをクリックすると、変換の為の設定を中断して、Main Menu に戻る。

図 6. Attribute File Format

表示されている Data Sample を参考にして項目毎の Format を設定する。

Header Lines は、AttributeFile の Data 以外（項目名やコメント）の行数を表し、デフォルトは 0（1 行）である。（変更可） Body Lines は Data Sample の行数を表し、デフォルトは 10 である（変更可）

Define ボタンをクリックすると Format Definition（図 7 参照）が表示され、設定結果が Format Block に表示される。設定をやり直す場合、Clear ボタンをクリックすると全ての設定が消去される。

OK ボタンをクリックすると ID Attribute Selection（図 8 参照）が表示される。

Cancel ボタンをクリックすると、Generate to Coverage に戻る。

図 7. Format Definition

この Dialog Box で、項目毎の設定を行う。

Name に項目名を入力する。Attribute File から自動的に項目名が入手可能な場合、Attribute File から入手した項目名を表示している。

Type を CHAR, NUMBER, INTEGER, BINARY の内から選択する。

Internal Width, Output Width, Decimal Places をそれぞれ入力する。

Next ボタンをクリックすると、設定を確定し次の項目の設定になる。  
Done ボタンをクリックすると、設定を確定し Attribute File Format に戻る。

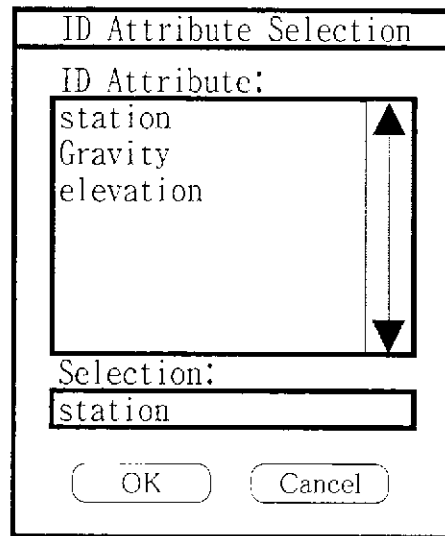


図 8. ID Attribute Selection

ID Attribute を選択する。リストに選択可能な項目が表示されるので選択する。  
下の Selection ボックスに選択した項目が表示される。  
OK ボタンをクリックすると、変換を開始し、変換終了後 Main Menu に戻る。  
Cancel ボタンをクリックすると、Generate to Coverage に戻る。

#### 4.4.3 Coverage to Generate

Coverage を Generate File と Attribute File に変換する画面。(図9参照)

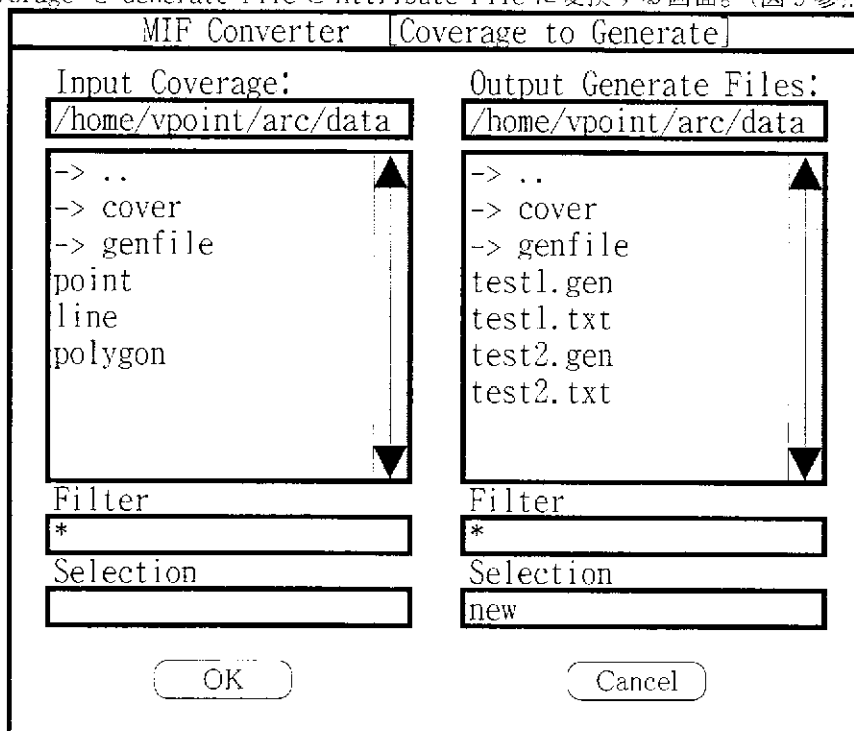


図9. Coverage to Generate

#### 操作方法

1. 左のリストボックスから、変換元 Coverage を選択する。
2. 右のリストボックスから、変換後 Generate File と Attribute File とを格納するディレクトリを指定する。File 名はプログラムが自動的に付けるが、明示的に Generate File 名と Attribute File 名を付けたい場合、Selection 入力ボックスに、File 名を拡張子を付けずに入力する。また、既存の Generate File と Attribute File とに置き換えたい場合、リストボックスで File を選択し、Selection 入力ボックスで拡張子を消すと、選択した File 名で Generate File と Attribute File とを作成する。Generate File には .gen、Attribute File には .txt という拡張子をプログラムが自動的に付ける。
3. OK ボタンをクリックすると、Feature Type 選択用 Dialog Box (図10参照) を表示する。
4. Cancel ボタンをクリックすると、変換の為の設定を中断して、Main Menu に戻る。

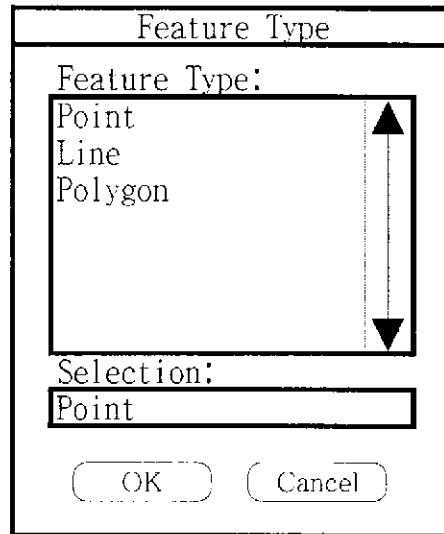


図10. Feature Type 選択用 Dialog Box

Feature Type を選択する。リストに選択可能な項目が表示されるので選択する。  
下の Selection ボックスに選択した項目が表示される。  
OK ボタンをクリックすると、変換を開始し、変換終了後 Main Menu に戻る。  
Cancel ボタンをクリックすると、Coverage to Generate 画面に戻る。

#### 4.4.4 Coverage to MIF

Coverage を MIF File に変換する画面。(図 1 1 参照)

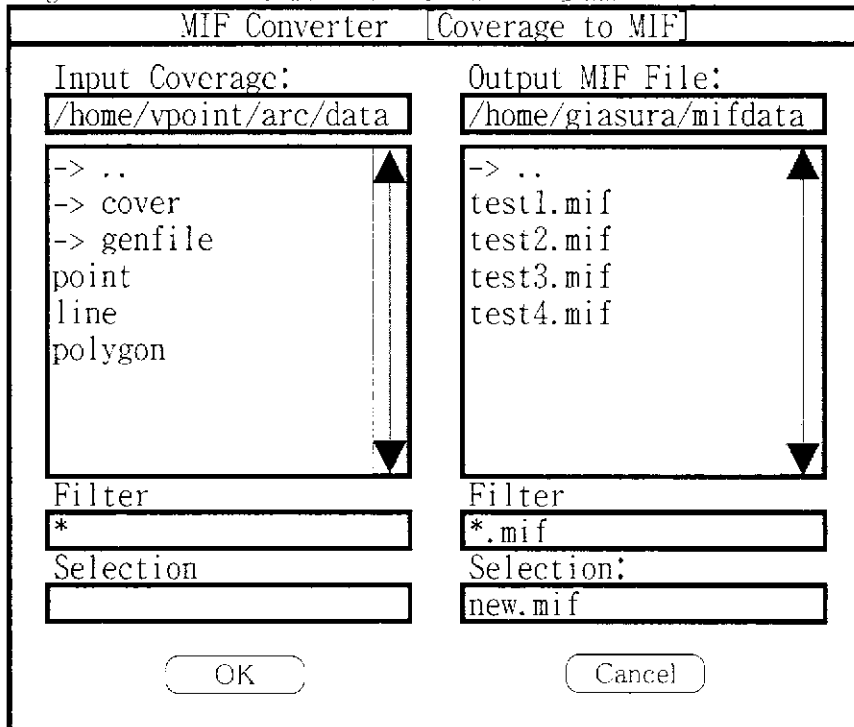


図 1 1. Coverage to MIF

#### 操作方法

1. 左のリストボックスから、変換元 Coverage を選択する。
2. 右のリストボックスから、変換後 MIF File 格納ディレクトリを指定する。File 名はプログラムが自動的に付けるが、明示的に MIF File 名を付けたい場合、Selection 入力ボックスに、MIF File 名を入力する。また、既存の MIF File と置き換えたい場合、リストボックスで MIF File を選択すると、選択した MIF File 名で MIF File を作成する。
3. OK ボタンをクリックすると、MIF の Comment 入力用 Dialog Box (図 1 2 参照) が表示される。
4. Cancel ボタンをクリックすると、変換の為の設定を中断して、Main Menu に戻る。

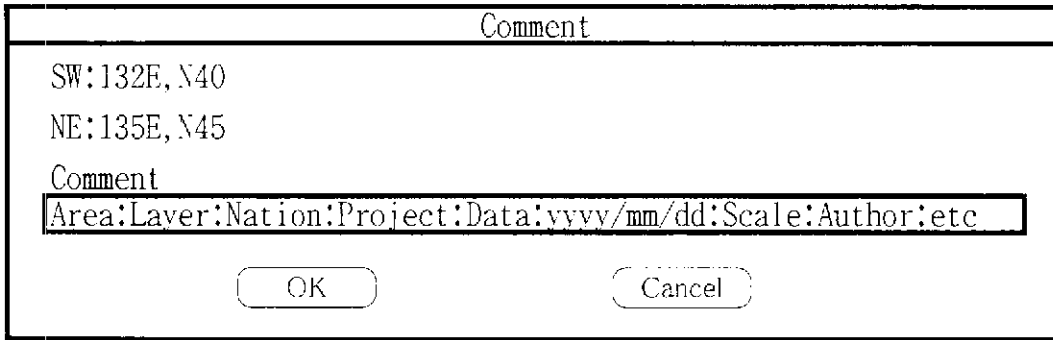


図 1 2。Comment 入力用 Dialog Box

SW, NE は、変換元 Coverage を解析した値を表示する。

Comment は、エリア名：レイヤー名：国名：プロジェクト名：原図名：原図作成日付：原図縮尺：原図発行者：その他を入力する。

OK ボタンをクリックすると、Feature Type 選択用 Dialog Box (図 1 3 参照) を表示する。

Cancel ボタンをクリックすると、Coverage to MIF に戻る。

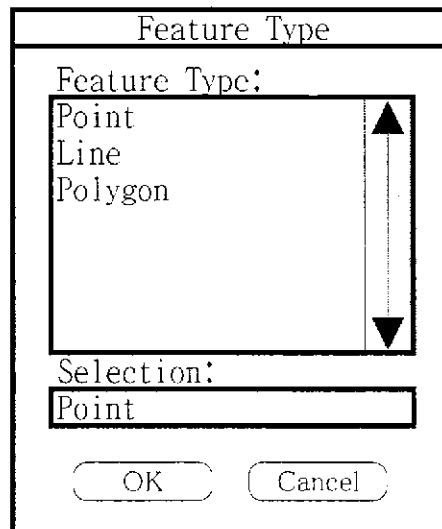


図 1 3。Feature Type 選択用 Dialog Box

Feature Type を選択する。リストに選択可能な項目が表示されるので選択する。

下の Selection ボックスに選択した項目が表示される。

OK ボタンをクリックすると、変換を開始し、変換終了後 Main Menu に戻る。

Cancel ボタンをクリックすると、Coverage to MIF 画面に戻る。

参考資料

ESRI WHITE PAPER SERIES

SEPTEMBER 1992 ARC/INFO : GIS Today and Tomorrow

SEPTEMBER 1995 ArcView Version2 Shapefile Technical Description

ARC/INFO ONLINE HELP

GENERATE File Format Description

## 資料 1 GENERATE File Format Description

# GENERATE

adds features to a coverage. Coordinates for each feature may be entered from the terminal or from a file.

---

**GENERATE <cover>**

## argument

**<cover>** - the coverage to be generated. If the coverage does not already exist, GENERATE will create the coverage.

## subcommands

New features are added to a new or existing coverage using a variety of subcommands. Subcommands may be entered in any order. In addition to adding features, the subcommands can be used to obtain on-line help, return to system level, or specify the mode in which information will be input. Subcommands that add features, by default, will prompt the user for the required information.

The following subcommands may be used at the Generate: prompt:

<u>ANNOTATIONS</u>	<u>CIRCLES</u>	<u>COMMANDS</u>
<u>COMMANDS</u>	<u>COPYTICS</u>	<u>CURVES</u>
<u>FISHNET</u>	<u>HELP</u>	<u>INPUT</u>
<u>LINES</u>	<u>LINKS</u>	<u>POINTS</u>
<u>POLYS</u>	<u>QUIT</u>	<u>ROUTES</u>
<u>TICS</u>		

Information for each feature can also be read from a file using the INPUT subcommand. The Generate: prompt reappears after the subcommand has been executed.

## notes

- GENERATE creates new coordinate features. It does not create topology or attributes for these features.
- When creating a new coverage, the coordinate precision is determined by the current creation rule as set by the PRECISION command. If the creation rule has not yet been established using PRECISION during the current ARC/INFO session, then the creation rule will be SINGLE. This means that GENERATE will create a coverage in single precision.
- If using double-precision data from a file as input, use PRECISION to specify that the creation rule be DOUBLE before running GENERATE.
- When generating features for an existing coverage, the coordinate precision for new features will be the same as the coordinate precision of the existing coverage.
- If the COPYTICS subcommand is used, all existing tics in <cover> are replaced.
- To add tics to a coverage without replacing existing tics, use the TICS subcommand. Note the TICS subcommand will replace existing tics if they have the same ID number.
- Polygons generated with the POLY subcommand will be closed automatically from the last vertex entered to the first vertex, if the two vertices are not the same.
- Features can be created by reading coordinates from an input file using the INPUT subcommand. The AML directive &RUN can also be used to read coordinates from a file, but INPUT executes faster.

- GENERATE updates the boundary of the coverage (BND) to include all the newly generated features. Unless tics already exist or are generated using COPYTICS or TICS, the tics for the coverage will be defined at the four corners of the coverage boundary.
- Coordinates read from an input file can be in x y z format. GENERATE ignores the z values if they exist.

## discussion

GENERATE provides an easy mechanism to create ARC/INFO coverages from raw coordinates or add features to existing coverages. This means that any coordinate data can be loaded into ARC/INFO as long as you can put the coordinates into the appropriate GENERATE format. For example, to generate lines, you would need to create a text file that has a User-ID number for each line, followed by the series of xy coordinate pairs that define the line. The exact formats for these files are described for each subcommand.

A coverage created by GENERATE is similar to a coverage after DIGITIZE; topology has not yet been defined for the features in the coverage. Other ARC commands such as BUILD or CLEAN can be used to create the topology.

### **ANNOTATIONS {subclass} {level} {symbol}**

Adds annotations to the coverage. You can specify the annotation subclass name, level and the text symbol number associated with the set of annotations.

{subclass} - name of the subclass the annotation will be written to. This subclass name can be any alphanumeric string up to 11 characters long not starting with a number. To add annotation to the coverage without specifying a subclass name, leave this option blank. A cover can have multiple annotation subclasses.

## GENERATE

{level} - specifies a storage category. For example, annotation for secondary roads may be stored in a different level than major highways. ARCEDIT and other ARC/INFO programs allow you to access annotation by level.

{symbol} - a text symbol number that defines the display characteristics for font, color, style, slant and quality. {symbol} is the number used to access these characteristics from a textset file for use in other ARC/INFO programs such as ARCPLOT. The prompts used to enter ANNOTATIONS are

Enter Annotations in the form:

```
<ID> <X> <Y> <angle> <size> <text...>
```

Id,X,Y,Angle,Size,Text:

ID - The ID number for the annotation being added.

X and Y - identifies the coverage coordinates for the lower-left beginning point of the text string being entered.

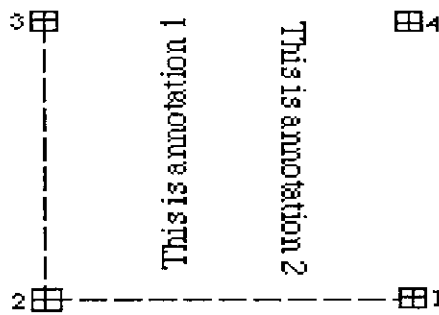
angle - is the text angle given in degrees counterclockwise from the horizontal, which is zero degrees. If angle is 0, generated annotation will be one-point annotation. If angle is other than 0, generated annotation is two-point annotation.

size - is the annotation height in coverage units.

text - is the text string to be generated (up to 80 characters in length). To continue a text string on another line, end the first line with a continuation character: ~.

Use END or a carriage return to stop entering annotation.

Note: GENERATE will not verify that the size value you enter for annotation is given in coverage units. Be sure you enter Size correctly.



```
Arc: generate example1
Generate: annotations test 1 10
```

```
Enter annotations in the form:
<ID> <X> <Y> <angle> <size> <text...>
Terminate input by entering END.
ID,X,Y,Angle,Size,Text:1 2 1 90 .3 This is annotation 1
ID,X,Y,Angle,Size,Text:2 3 4 -90 .3 This is annotation 2
ID,X,Y,Angle,Size,Text:end
Generate: quit
```

## CIRCLES {LABELS | NOLABELS}

Generates circles, each with a specified center and radius.

{LABELS | NOLABELS} - specifies whether or not labels will be added at the center of each circle. Labels are generated by default.

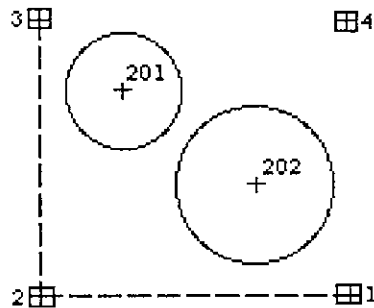
The prompts for adding CIRCLES are

```
Enter Circles.
Terminate input by entering END
ID,X,Y,Radius:
```

Enter one circle per line by specifying the User-ID, the x,y coordinates for the center of the circle and the radius. The radius is specified in coverage units. The User-ID will be assigned to both the arc and the label unless NOLABELS is used, then only the arc will be assigned the User-ID. This prompt is repeated once per circle,

## GENERATE

until you type END or a carriage return. If any of the four items of information for a circle is omitted, the circle prompt is repeated so that all information for that circle can be entered correctly.



Arc: **generate example2**

Generate: **circles**

Terminate input by entering END

ID,X,Y,Radius: **201, 3, 7, 2.0**

ID,X,Y,Radius: **202, 9, 4, 3.0**

ID,X,Y,Radius: **end**

Generate: **quit**

## COPYTICS <tic\_cover>

Copies the tics from the <tic\_cover> to the <cover>. COPYTICS will delete any existing tics in the generate cover before copying tics from <tic\_cover>.

## COMMANDS {prefix}

Lists available subcommands for GENERATE or just the subcommands that begin with {prefix}.

{prefix} - the first letter or letters of the subcommands you want to list. All subcommands that begin with these letters will be listed.

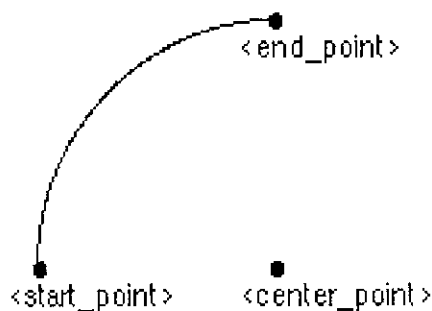
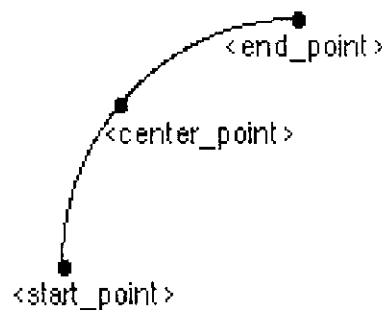
**CURVES {CENTER | ALONG} {grain}**

Generates curves using the specified grain value as the distance between vertices on each curve. There are two types of curves.

**CENTER** - the specified points include the starting point of the curve, a center point around which the curve is generated, and the ending point on the curve (i.e., curves are clockwise and circular). This is the default method for curve generation.

**ALONG** - all three points occur along the curve (i.e., all three points are fit through the curve).

**grain** - specifies the distance between vertices. This distance must be a positive integer or real number. The default {grain} value is 1.

**CURVES CENTER****CURVES ALONG**

The prompts for adding CURVES are

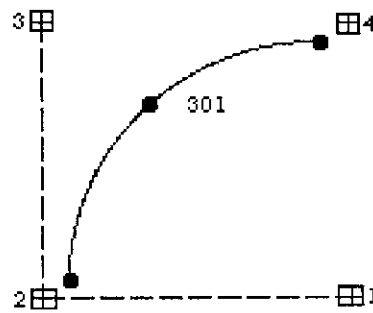
**CENTER**

Enter Curves in the form:

```
<id> <start_point> <center_point> <end_point>
```

Terminate input by entering END.

Id, Start, Center, End:



## ALONG

Enter Curves in the form:

```
<id> <start_point> <point_along_curve> <end_point>
```

Terminate input by entering END.

Id, Start, Along, End:

Enter one curve per line by specifying the arc's User-ID and the x,y coordinates for three points: the starting point, the center point and the ending point. Use END or a carriage return to stop entering curves.

Arc: **generate example3**

Generate: **curves along .05**

Generate: Enter Curves in the form:

```
<id> <start_point> <point_along_curve> <end_point>
```

Terminate input by entering END

Id, Start, Along, End: **301, 1,0 2,2 5,3**

Id, Start, Along, End: **end**

Generate: **quit**

## FISHNET {LABELS | NOLABELS}

Creates a fishnet of rectangular cells. Nodes are created at intersection points of each cell.

{LABELS | NOLABELS} - specifies whether or not labels will be added at the center of each fishnet cell. Labels are generated by default.

The Fishnet prompts are

Fishnet Origin Coordinate (X,Y):

Y-Axis Coordinate (X,Y):

Cell Size (Width,Height):

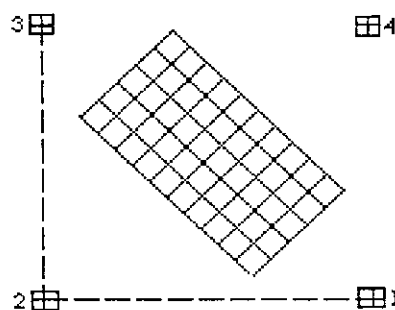
Number of Rows, Columns:

If 0 is specified for rows, then specify:

Opposite Corner of fishnet (X,Y):

The fishnet origin is the lower-left corner of the fishnet. The y-axis coordinate is a point on the positive y-axis from the origin point and is used to orient the fishnet. Cell size refers to the size of the cells in the x and y directions. Cell sizes are expressed in coverage units. The number of rows and columns is used together with the cell size to determine the size of the fishnet.

If 0 is entered for the number of rows, the specified cell size will be used to automatically calculate how many rows and columns can fit within the area defined by the origin and the upper-right corner without exceeding the corner coordinates.



Arc: **generate example4**

Generate: **fishnet**

Origin Coordinate (X,Y): **3,0**  
Y-Axis Coordinate (X,Y): **0,7**  
Cell Size (Width,Height): **1,1**  
Number of Rows, Columns: **10,5**  
Generate: **quit**

## **HELP {subcommand}**

On-line help is available for all subcommands. Type **help** followed by the name of a subcommand.

## **INPUT <TTY | file>**

Specifies the source of data: keyboard entry or input data file.

<TTY> - the user will be prompted for the coordinates and feature definitions from the terminal. This is the default when GENERATE is first initiated.

<file> - specifies that coordinates and feature definitions will be read from a text file. This information must begin on the first line of the file and be in the same format as if prompted from the terminal, in integers and real numbers. Geographic coordinates in degrees, minutes and seconds (DMS) must be converted to decimal degrees before they can be used as input coordinates. INPUT <file> must be given before the subcommand that will generate new features. If the subcommand encounters an error in the input file and fails to execute, return to interactive mode by reissuing the INPUT command with the <TTY> argument.

**LINES**

Adds arcs to the coverage. The prompts for adding LINES are

Enter Lines.

Terminate line by entering END at X,Y: prompt.

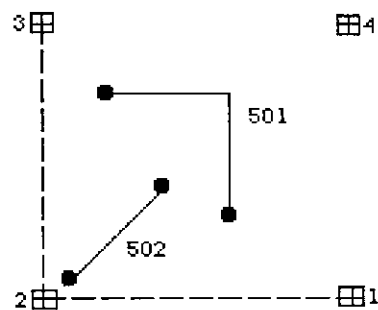
Terminate input by entering END at ID: prompt.

ID:

X,Y:

Enter the User-ID for the line feature at the ID: prompt. Then enter the x,y coordinate pairs for each vertex, one pair per X, Y: prompt. The coordinates of each pair may be separated with a comma or a space. Type **end** or a carriage return to stop entering coordinates for that line feature.

Enter more lines using the procedure described above. After all lines have been entered, type **end** or a carriage return at the ID: prompt.



Arc: **generate example5**

Generate: **lines**

Enter lines.

Terminate line by entering END at X,Y: prompt.

Terminate input by entering END at ID: prompt.

ID: **501**

X,Y: **2,8**

```

X,Y: 5,8
X,Y: 5,5
X,Y: end
ID: 502
X,Y: 1,2
X,Y: 4,5
X,Y: end
ID: end
Generate: quit

```

## LINKS

Adds links to the coverage. The prompts for adding links are

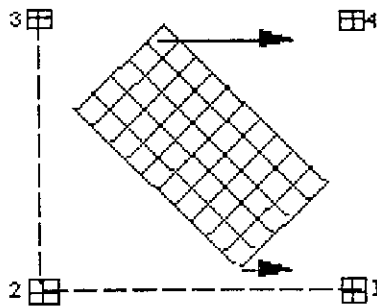
Enter Links.

Terminate line by entering END at X,Y: prompt.

X,Y:

X,Y:

Enter each of the two points that define the link, one pair per X, Y: prompt. The coordinates of each pair may be separated with a comma or a space. Type **end** (or hit the carriage return) to stop entering coordinates. A check is made to ensure that two coordinate pairs are entered for each link. Identity links can be added by specifying the same coordinates for both x,y pairs.



Arc: **generate example6**

Generate: **links**

Enter links.

Terminate input by entering END at Start\_X,Y: prompt.

X,Y: **3,10.5**

X,Y: **6,10.5**

X,Y: **3,0**

X,Y: **4,0**

X,Y: **end**

Generate: **quit**

## POINTS

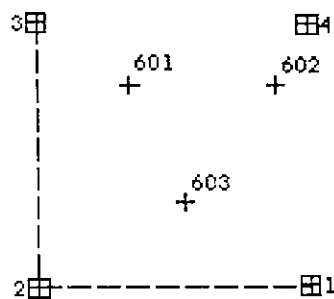
Adds label points to the coverage. The prompts for adding POINTS are

Enter Points.

Terminate input by entering END at the ID,X,Y: prompt.

ID,X,Y:

Enter one point per line specifying the User-ID and x,y location for the point feature. Use END or carriage return to stop entering points. If one of the three items of information for a point is omitted, the prompt is repeated so that all information for that point can be entered correctly.



Arc: **generate example7**

Generate: **copytics example4**

Generate: **points**

Enter points.

Terminate input by entering

END at ID,X,Y: prompt.

ID,X,Y: **601,3,7**

ID,X,Y: **602,9,7**

ID,X,Y: **603,5,4**

ID,X,Y: **end**

Generate: **quit**

## POLYS

Adds polygons and label points to the coverage. The prompts for adding POLYS are

Enter polygons.

Terminate polygon by entering END at X,Y: prompt.

Terminate input by entering END at ID: prompt.

ID,X,Y:

X,Y:

Enter a POLY-ID and the x,y coordinates for the polygon label at the ID, x, y: prompt. Then enter the x,y coordinate pairs for each vertex one pair per X, Y: prompt. The coordinates of each pair may be separated with a comma or a space. Multiple coordinate pairs may be entered at a single X, Y: prompt if they are separated by semicolon. Type **end** (or hit the carriage return) to stop entering coordinates for that polygon feature. Enter more polygons using the procedure described above. After all polygons have been entered, type **end** or a carriage return at the ID, x, y: prompt.

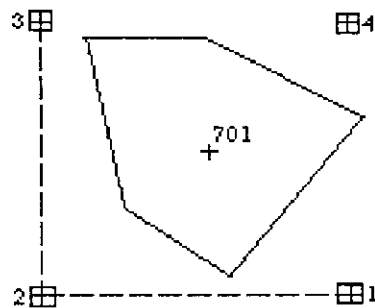
If 0 is entered for the ID, X, Y: prompt, then no polygon label will be generated for that polygon.

## GENERATE

For automatic polygon label placement Enter **AUTO** after the POLY-ID rather than coordinate values.

Polygons will be closed automatically from the last vertex entered to the first vertex, if the two vertices are not the same.

The User-ID of the arcs that make up the newly generated polygon features will be zero.



Arc: **generate example8**

Generate: **polys**

Enter polygons.

Terminate polygon by entering END at X,Y: prompt. Terminate input by entering END at ID,X,Y: prompt.

ID,X,Y: **701,7,7**

X,Y: **3,9**

X,Y: **4,5**

X,Y: **8,4**

X,Y: **9,7**

X,Y: **6,9**

X,Y: **3,9**

X,Y: **end**

ID,X,Y: **end**

Generate: **quit**

Arc: **generate example9**

Generate: **polys**

Enter polygons.

Terminate polygon by entering END at X,Y: prompt. Terminate input by entering END at ID,X,Y: prompt.

ID,X,Y: **701,auto**

X,Y: **3,9 ; 4,5 ; 8,4 ; 9,7 ; 6,9 ; 3,9**

X,Y: **end**

ID,X,Y: **end**

Generate: **quit**

## **ROUTES <route\_system> {dissolve\_fuzzy}**

Creates arcs from x,y coordinate data and defines routes on them.

<route\_system> - the name of the route-system to be created or appended to.

{dissolve\_fuzzy} - a numeric distance in coverage units used to dissolve (merge) adjacent sections. This value determines which adjacent sections are dissolved. Adjacent sections are dissolved if none of the original measure values along the sections are displaced more than {dissolve\_fuzzy} coverage units from their original location. If no {dissolve\_fuzzy} is specified, no sections are dissolved. If a {dissolve\_fuzzy} of 0 is specified, only adjacent sections with equal measure/length ratios are dissolved.

The ROUTES usage of GENERATE has two prompts, ID: and Measure, X, Y: Specify the route ID (the value of the user-id in the RAT) at the ID: prompt. The Measure, X, Y: prompt will appear next, At this prompt, enter a measure value, an X coordinate value, and a Y coordinate value. Continue to enter these values for each section in the route. When finished entering all sections in a route, use the END keyword.

## GENERATE

The following example shows how to use **GENERATE ROUTES** to create a route with a User- ID of 15.

Generate: **ROUTES SHOTPTS**

Enter Sections.

Terminate Section by entering END at Measure,X,Y: prompt.

Terminate input by entering END at ID: prompt.

ID: **15**

Measure, X, Y: **0 0 0**

Measure, X, Y: **10 1 0**

Measure, X, Y: **20 2 0**

Measure, X, Y: **30 3 0**

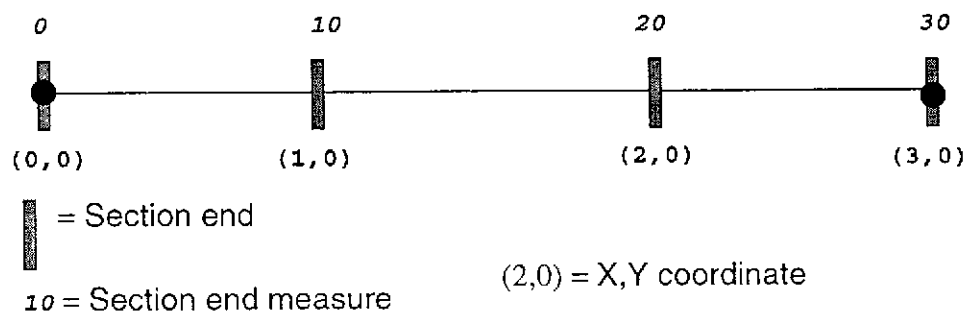
Measure, X, Y: **END**

ID: **END**

Sorting sections...

Generate: **q**

In this example, one arc is created. Route 15 of route-system SHOTPTS is defined on the arc and contains three sections having measures 0 to 10, 10 to 20 and 20 to 30. Each section has a coverage length of 1 meter. The following diagram illustrates route 15.



## GENERATE

After using GENERATE, use BUILD with the LINE option to build the coverage.

The above example produced three sections, each having a cover length of 1 meter and a measure length of 10. This route could be represented with just one section:



The {dissolve\_fuzzy} option is useful for reducing the size of the section table. The following example shows how to use the {dissolve\_fuzzy} option to dissolve sections as they are created.

```
Generate: ROUTES SHOTPTS 0.0
```

```
Enter Sections.
```

```
Terminate Section by entering END at Measure,X,Y: prompt.
```

```
Terminate input by entering END at ID: prompt.
```

```
ID: 15
```

```
Measure, X, Y: 0 0 0
```

```
Measure, X, Y: 10 1 0
```

```
Measure, X, Y: 20 2 0
```

```
Measure, X, Y: 30 3 0
```

```
Measure, X, Y: END
```

```
ID: END
```

```
Sorting sections...
```

```
Generate: q
```

Note how the same data is input in this example as in the previous example, the only difference being the use of 0.0 here for {dissolve\_fuzzy}. A {dissolve\_fuzzy} of 0.0 joins together any adjacent sections having equal measure/cover length ratios. Since each input section has a measure length of 10 and a cover length of 1, they are

## GENERATE

dissolved into one section. A {dissolve\_fuzzy} of 0.0 produces no loss in the positional accuracy of the measures.

Adjacent sections often have measure/cover length ratios that are not equal. To dissolve these sections, a {dissolve\_fuzzy} greater than 0.0 must be used. This displaces measures along the sections, causing a loss in positional accuracy. A {dissolve\_fuzzy} of 1 specifies that adjacent sections will be dissolved if all measures along a section are displaced by no more than one coverage unit. Similarly, {dissolve\_fuzzy} of 5 produces section measures that are within 5 coverage units of their actual positions.

## TICS

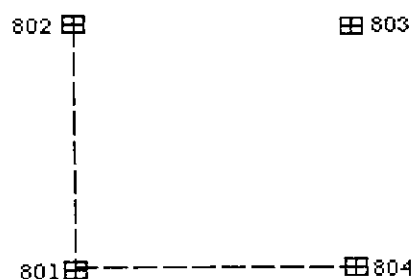
Adds tics to the coverage. The prompts for adding TICS are

Enter Tics.

Terminate input by entering END at ID,X,Y: prompt.

ID, X,Y:

Enter one tic per line by specifying the User-ID and the x,y coordinates for each tic. Use END or a carriage return to stop entering tics. If one of the three items of information for a tic is omitted, the prompt is repeated so that all information for that tic can be entered correctly.



## GENERATE

Arc: **generate example10**

Generate: **tics**

Enter Tics.

Terminate input by entering END at ID,X,Y: prompt.

ID,X,Y: **801,0,0**

ID,X,Y: **802,0,10**

ID,X,Y: **803,10,10**

ID,X,Y: **804,10,0**

ID,X,Y: **end**

Generate: **quit**

### QUIT

Used to terminate GENERATE.

## using input files

If your input is coming from a file, the data in the file should be in the same form as if prompted from the terminal. The actual format depends on the subcommand you plan to use.

Specify INPUT <file> before giving the command (such as LINES) to generate new features. Then when you issue the LINES (or another GENERATE subcommand), the coordinates and feature definitions will be read from the specified INPUT file.

The following is a chart with the input file format for each of the subcommands that add features.

ANNOTATIONS	CIRCLES	CURVES	FISHNET
-------------	---------	--------	---------

## GENERATE

1 2 1 90 .3 annotation 1 2 3 4 -90 .3 annotation 2 END	201,3,7,2.0 202,9,4,3.0 END	301, 1,0 2,2 5,3 END	3,0 0,7 1,1 10,5 END
--------------------------------------------------------------	-----------------------------------	-------------------------	----------------------------------

LINKS	LINES	POINTS	POLYS	TICS
3,10.5	501	601,3,7	701,7,7	801,0,0
6,10.5	2,8	602,9,7	3,9	802,0,10
3,0	5,8	603,5,4	4,5	803,10,10
4,0	5,5	END	8,4	804,10,0
END	END		9,7	END
	502		6,9	
	1,2		3,9	
	4,5		END	
	END		END	
	END			

### example use of INPUT

This example shows how to use INPUT to read data from a file for points into GENERATE.

Here is a listing of a file named PT.FILE.

```
1, 100, 100
2, 99, 112
3, 112, 119
4, 121, 98
5, 107, 102
END
```

```
Arc: generate ptcov
```

```
Generate: input pt.file
Generate: points
Generating points...
Generate: quit
Externalling BND and TIC...
Arc:
```

The next example shows how to use &RUN instead of INPUT. Note that INPUT execution is much faster.

## example use of &RUN

This example shows how to use the AML &RUN directive to load data from a simple file into GENERATE. The LINE subcommand is first issued to specify the type of features to be created. As soon as the first prompt appears, use &RUN to load a LINE generate file.

Here is a listing of a text file named LINE.AML.

```
101
2,3
4,3
4,6
END
101
2,3
4,3
4,6
END
102
2,1
3,2
END
END
```

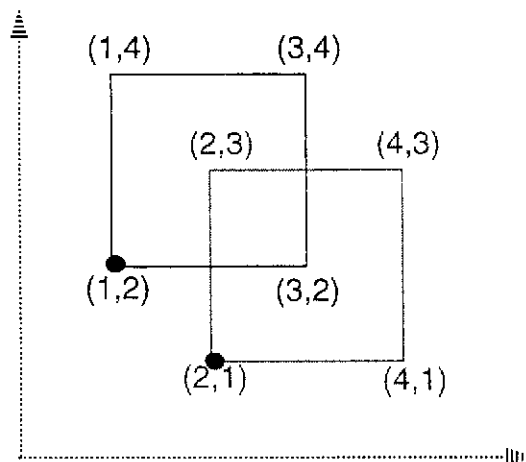
```

Arc: generate gencov
Generate: line
Enter lines.
Terminate line by entering END at X,Y: prompt.
Terminate input by entering END at ID: prompt.
ID: &run line
Generate: q
Externalling BND and TIC...
Arc:

```

## GENERATE regions from arcs

GENERATE does not have a REGION subcommand, so you must use the LINE subcommand to produce the closed-loop arcs that outline the regions. Further processing with REGIONCLASS and BUILD or CLEAN will create the regions.



Regions can be generated by entering valid line data at the terminal. For best results, the lines input must form closed loops.

```

Arc: generate linecov
Generate: lines
Enter Lines.

```

## GENERATE

Terminate Line by entering END at X,Y: prompt.  
Terminate input by entering END at ID: prompt.

```
ID: 1
X,Y: 1,2
X,Y: 3,2
X,Y: 3,4
X,Y: 1,4
X,Y: 1,2
X,Y: end
```

```
ID: 2
X,Y: 2,1
X,Y: 4,1
X,Y: 4,3
X,Y: 2,3
X,Y: 2,1
X,Y: end
```

```
ID: end
Generate: quit
  Externalling BND and TIC...
```

Build the line coverage.

```
Arc: build linecov line
  Building lines...
```

Use the regionclass command to build the preliminary regions, using the line coverage-ID as the subclass item.

```
Arc: usage regionclass
Usage: REGIONCLASS <in_cover> {out_cover} <out_subclass>
      {in_region_item} {out_region_item}
      {selection_file}
Arc: regionclass linecov regioncov sub linecov-id
  (Re)building nodes...
  2 unique nodes built for REGIONCOV
```

## GENERATE

Grouping arcs for regions...  
2 preliminary region(s) appended to subclass sub.

Clean the polygons in the region coverage. This will add topology to the preliminary region coverage.

```
Arc: clean regioncov regioncov # # poly  
Cleaning REGIONCOV  
Sorting...  
Intersecting...  
Assembling polygons...  
Re-building AAT...
```

Regions can also be generated from a file created with **UNGENERATE**, **REGION**.subclass option. The file created by **UNGENERATE** contains the coordinates of the closed rings of the regions. Each is preceded by the User-ID, and followed by **END**. The User-IDs are unique for the regions. If the user has changed them, the **GENERATE** may not work properly.

After **GENERATE** with **LINE** subcommand, **BUILD** or **CLEAN** the coverage with the **LINE** option to create line topology. Then use **REGIONCLASS** with the Cover-ID as the <in\_region\_item>. Issuing **BUILD** or **CLEAN** with the **POLY** option will then restore the regions.

```
Arc: ungenerate region.water m3 m3.ungen  
Arc: generate m3_gen  
Generate: input m3.ungen  
Generate: line  
Generate: q
```

```
Arc: build m3_gen line
```

```
Arc: regionclass
```

## GENERATE

Usage: REGIONCLASS <in\_cover> {out\_cover} <out\_subclass>  
          {in\_region\_item} {out\_region\_item}  
          {selection\_file}

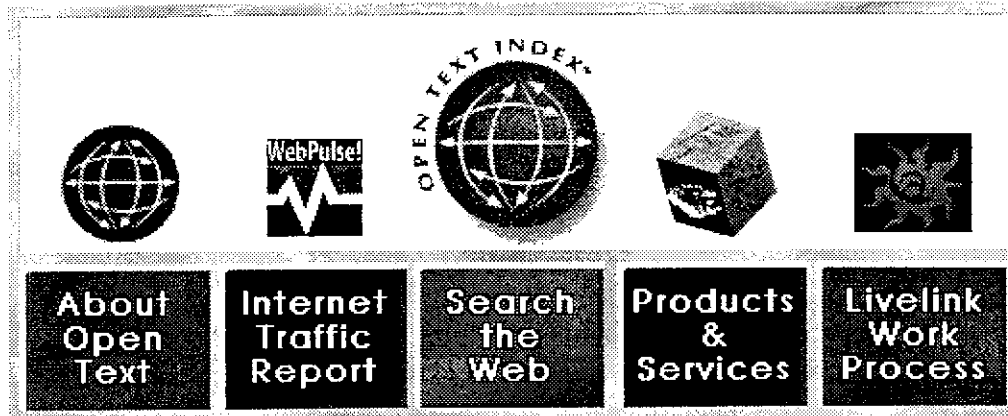
Arc: **regionclass m3\_gen # water m3\_gen-id**

Arc: **build m3\_gen**

For more information on generating regions, see [Creating regions](#).

資料2 米国ホームページ検索サービス (Open Text Index) による検索結果

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1. World-Wide Web Access Statistics for [www.csc.ncsu.edu](http://www.csc.ncsu.edu) (score: 10342, size: 1321.2k)  
From: [http://www.csc.ncsu.edu/statistics/stat\\_files/Jun.wwwstats.html](http://www.csc.ncsu.edu/statistics/stat_files/Jun.wwwstats.html)
  1. Totals for Summary Period: Jun 30 1995 to Jun 1...
  2. Daily Transmission Statistics
  3. Hourly Transmission Statistics<[Visit the page | See matches on the page | Find similar pages]
2. .mirror (score: 6429, size: 617.6k)  
From: <ftp://ftp.amug.org/pub/mirrors/info-mac/.mirror>  
mirroring info-mac (sumex-aim.stanford.edu:/info-mac) completed successfully @ Wed Oct 12 13:46:30 MST 1994 NEED TO rmdir /ftp/mnt/ftpl/info-mac/snd NEED TO rmdir /ftp/mnt/ftpl/info-mac/app mirroring info-mac (sumex-aim.stanford.edu:/info-mac) completed succ  
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3. psdd.txt (score: 4451, size: 623.1k)  
From: <http://stardust.jpl.nasa.gov/psdd/psdd.txt>  
Object Alias List Alias Name: Is Alias for: bitcolumn bit\_column cube qube data\_set\_map\_project\_catalog data\_set\_map\_projection dataset data\_set datasetinfo data\_set\_information datasettarg data\_set\_target discd discipline\_description ds\_map\_proj\_ref\_info\_ca  
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4. ALL\_FILES (score: 4207, size: 577.3k)  
From: [http://www.funet.fi/pub/dx/files/ALL\\_FILES](http://www.funet.fi/pub/dx/files/ALL_FILES)  
Dec 08 16:02 1993 pub/dx/: dx-adm@ftp.funet.fi 0 Dec 08 16:03 1993 pub/dx/: Maintainers' address is 991580 Mar 04 04:24 1995 pub/dx/files/ALL\_FILES 991580 Mar 04 04:35 1995 pub/dx/files/FILES\_by\_date 37437 Mar 04 04:35 1995 pub/dx/files/NON\_FILES 90635 Mar 0  
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5. info.umd.edu Home Page (score: 3938, size: 462.5k)  
From: <gopher://info.umd.edu:1800/00/NewData>
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  - 2.
  - 3.[Visit the page | See matches on the page | Find similar pages]
6. info.umd.edu Home Page (score: 3372, size: 328.0k)  
From: <gopher://info.umd.edu:1800/h0/SoftwareLib>
  - 1.
  - 2.
  - 3.[Visit the page | See matches on the page | Find similar pages]
7. SDTS format data available/Digital Line Graph data available in SDTS format (score: 3244, size: 3.5k)  
From: <http://www-nmd.usgs.gov/esic/sdtsnews.html>  
The U.S. Geological Survey (USGS) has released its 1:100,000-scale vector data in Spatial Data Transfer Standard (SDTS) format. The entire data base of 1:100,000-scale transportation and hydrography digital cartographic data is now available via the Internet  
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8. Introductory PC ARC/INFO Certificate Course (score: 2415, size: 2.6k)  
From: <http://flash.lakeheadu.ca/~regwww/caris/intro.html>  
Date: April 24 - May 5, 1995  
Format: 10 day (Monday to Friday) hands on course in a 486PC enviroment. The course will focus on OBM and FRI data structures. <  
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9. Table of Contents (score: 1948, size: 205.4k)

From: <http://info.risc.uni-linz.ac.at/about/TOC-www.html>

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10. SPDS-MOLD Data by Type/The Magnetospheric Yellow Pages (score: 1895, size: 62.2k)

From: <http://leadbelly.lanl.gov/spds/data-by-type.html>

Data Servers by Data Type

1. List of Data Types

2. AMPTE<

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2. Table of Contents (score: 1877, size: 203.0k)  
From: <http://info.risc.uni-linz.ac.at:70/0h/about/TOC-www.html>  
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3. index (score: 1520, size: 1211.6k)  
From: <http://128.214.248.6/pub/misc/archive/index>  
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4. Graphics File Formats FAQ (Part 1 of 4): General Graphics Format Questions (REPOST) (score: 1478, size: 92.6k)  
From: <http://www.uni-konstanz.de/misc/faqs/msg00072.html>  
file formats, including, raster, vector, metafile, Page Description Language, 3D object, animation, and multimedia formats. This FAQ is divided into four parts, each covering a different area of graphics file format information: Graphics File Formats FAQ (Part 1 of 4): General Graphics Format Questions (REPOST)  
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file formats, including, raster, vector, metafile, Page Description Language, 3D object, animation, and multimedia formats. This FAQ is divided into four parts, each covering a different area of graphics file format information: Graphics File Formats FAQ (Part 1 of 4): General Graphics Format Questions (REPOST)  
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6. Graphics File Formats FAQ (Part 1 of 4): General Graphics Format Questions (score: 1272, size: 87.3k)  
From: <http://math-www.uio.no/faq/graphics/fileformats-faq/part1.html>  
Date: Mon, 6 Nov 1995 03:00:42 GMT  
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7. Graphics File Formats FAQ (Part 1 of 4): General Graphics Format Questions (REPOST) (score: 1267, size: 86.0k)  
From: <http://math-www.uio.no/faq/graphics/fileformats-faq.html>  
Date: Thu, 7 Sep 1995 04:54:29 GMT  
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8. archive.log (score: 1186, size: 754.7k)  
From: <http://www.funet.fi/pub/archive/archive.log>  
Change to posting format intro Introduction to comp.sources.atari.st Patch1 travesty - make a travesty of the input, Patch1 me-etags Etags for MicroEmacs brkdig brkdig - break mailing list digest into USENET messages part03 newsclip 1.1, part 3 of 15 chgrp\_a  
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9. WWW\_title.html (score: 1050, size: 759.4k)

From: [http://www.cs.colorado.edu/home/mcbryan/WWW\\_title.html](http://www.cs.colorado.edu/home/mcbryan/WWW_title.html)

Salzburgラジオ日本とは!mod newsgroups!pubnet newsgroups!unix-pc newsgroups ( 鰯 駄鶏汁 鰯  
 蓑菜よ瑟 駄 - よ (13sep93) Welcome to comp.windows.x.pex! (FAQ) (No title) (No title)

/local\_web/dumand/acoustics/acoustic\_d

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10. WWW\_title.html (score: 1050, size: 751.9k)

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 蓑菜よ瑟 駄 - よ (13sep93) Welcome to comp.windows.x.pex! (FAQ) (No title) (No title)

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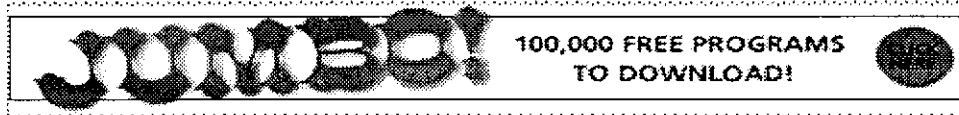
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From: gopher://info.umd.edu:1800/00/NewData  
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3. Summary of Export Problems in GRASS EXPORT (score: 2427, size: 6.5k)  
From: http://boeuf.ucdavis.edu:8001/root/docs/help/problems.etx  
1. Filesystem Problems  
2. DXF Problem  
3. DLG Problem<  
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4. EMAP Format Standards/Document Format Standards (score: 1714, size: 0.8k)  
From: http://134.67.99.11/emap/html/formats.html  
WordPerfect V5.1  
This is EPA's standard document format. Other formats have been made available to provide enhanced usability by the public. <  
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From: http://www.uni-konstanz.de/misc/faqs/msg00072.html  
file formats, including, raster, vector, metafile, Page Description Language, 3D object, animation, and multimedia formats. This FAQ is divided into four parts, each covering a different area of graphics file format information: Graphics File Formats FAQ (Pa  
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7. Graphics File Formats FAQ (Part 1 of 4): General Graphics Format Questions (score: 1464, size: 79.0k)  
From: http://www.uni-konstanz.de/misc/faqs/msg00078.html  
file formats, including, raster, vector, metafile, Page Description Language, 3D object, animation, and multimedia formats. This FAQ is divided into four parts, each covering a different area of graphics file format information: Graphics File Formats FAQ (Pa  
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8. index (score: 1442, size: 1211.6k)  
From: http://128.214.248.6/pub/misc/archive/index  
Change to posting format intro intro Introduction to comp.sources.atari.st Patch1 travesty/Patch1 travesty - make a travesty of the input, Patch1 me-etags me-etags Etags for MicroEmacs brkdig brkdig brkdig - break mailing list digest into USENET messages par  
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9. SAST Dataset List, GIS Data(Export Files) and Metadata, GIFS/SAST Datasets Available for FTP Access (score: 1330, size: 9.3k)  
From: http://edcwww2.cr.usgs.gov/dslist.html

1.1. The SAST Data set list shows the data themes available,...

1.2. View example graphic (Gif)

1.3. FTP Data (ARC Export Files)<

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10. Graphics File Formats FAQ (Part 1 of 4): General Graphics Format Questions (score: 1271, size: 87.3k)

From: <http://math-www.uio.no/faq/graphics/fileformats-faq/part1.html>

Date: Mon, 6 Nov 1995 03:00:42 GMT

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3. Table of Contents (score: 2037, size: 205.4k)  
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4. Table of Contents (score: 1970, size: 203.0k)  
From: http://info.risc.uni-linz.ac.at:70/0h/about/TOC-www.html  
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5. index (score: 1454, size: 1211.6k)  
From: http://128.214.248.6/pub/misc/archive/index  
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6. Simple Offline USENET Packet Format (SOUP) Version 1.2 (score: 1163, size: 43.0k)  
From: http://www.gatech.edu/acm/soup12.html  
1. DISTRIBUTION  
2. INTRODUCTION  
3. REVISION HISTORY<  
[Visit the page | See matches on the page | Find similar pages]
7. alt.binaries.pictures FAQ - OS specific info (score: 1156, size: 59.1k)  
From: http://math-www.uio.no/faq/pictures-faq/part3.html  
Date: Mon, 23 Oct 1995 08:30:37 GMT  
This is an USENET Frequently Asked Questions with answersfrom news.answers.  
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8. comp.fonts FAQ: General Info (2/6) (score: 1143, size: 53.1k)  
From: http://www.math.uio.no/faq/fonts-faq/part2.html  
Date: 15 Jun 1995 06:27:29 -0400  
This is an USENET Frequently Asked Questions with answersfrom news.answers.  
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9. comp.fonts FAQ: General Info (2/6) (score: 1142, size: 52.5k)  
From: http://www.cis.ohio-state.edu/hypertext/faq/usenet/fonts-faq/part2/faq.html

This topic is hotly debated at regular intervals on comp.fonts. Terry Carroll. provides the following analysis of current [ed: as of 6/92] legislation and regulation regarding fonts and copyrights in the United States. Terry is "Editor in Chief" of Volume 10  
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10. Metafont: All fonts available in .mf format (score: 1115, size: 30.5k)  
From: <http://www.math.uio.no/faq/fonts-faq/metafont-list.html>  
Date: Fri, 24 Nov 1995 23:06:24 GMT  
This is an USENET Frequently Asked Questions with answers from news.answers.  
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資料3 米国ホームページ検索サービス (WebCrawler Search) による検索結果



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## America Online acquires The WebCrawler

What follows is a short list of questions and answers about today's announcement that America Online is acquiring the WebCrawler. The press release provides the context for the information that follows. For press-related information, please contact Pam McGraw at America Online, by voice at (703) 556-3746, or email at PamMcGraw@aol.com.

What did they buy, and from whom?

America Online acquired the WebCrawler service and technology from Brian Pinkerton. In March, the service was transferred to America Online from the original WebCrawler service at the University of Washington. The final agreement transferring the WebCrawler was signed on April 25, 1995.

Does this mean the WebCrawler will be available only to AOL's customers?

No. The WebCrawler will continue to be freely available on the Internet. It is one way AOL can give something back to the Internet community.

Why sell the WebCrawler?

Early this year, the WebCrawler became increasingly difficult to run on a student budget, with student resources. Commercial support was clearly necessary. America Online offered the resources and expertise to improve and scale the WebCrawler beyond its current reach, and to explore new areas of Internet resource discovery.

Ugh. AOL??? Won't their involvement ruin the WebCrawler?

No way! If you like the WebCrawler, then you know it is operated by some Internet-savvy people. We will continue to run it. We will not censor the WebCrawler's content! We will maintain editorial control, and we'll use AOL's money to do it. What could be better?

What does AOL have to do with the Internet?

America Online is aggressively building an Internet-based business. In conjunction with their recent acquisition of The WebCrawler and GNN, they have announced their plans to provide Internet-only service to customers. Their core service will continue to offer its recently announced access to the Internet, and two other recent acquisitions, ANS and WAIS, are already providing strong Internet services. Recently, America Online brokered a consensus among online service providers and other Internet groups in a model for Internet security by investing in Terisa Systems, an Internet security concern.

In short, America Online is already a major player on the Internet, and is well positioned to continue its leading role.

What is the future of the WebCrawler Service itself?

The WebCrawler Service will only get better. Real resources are now dedicated to its care and feeding: improvements have already been made in its operation and availability, updates will begin to occur more frequently, and new services will begin to appear. AOL's and GNN's customers can look forward to new services in which the WebCrawler will play an important role.

What is the WebCrawler's official address?

The new URL for the WebCrawler is: <http://webcrawler.com/>.

What were the terms of the acquisition?

Because the transaction occurred with an individual, we are not releasing the terms of our agreement. Pinkerton will join America Online's subsidiary, WAIS Inc. to drive an effort to provide advanced search and indexing capabilities to AOL's customers and the Internet at large.

What relationship will the WebCrawler have to GNN?

The WebCrawler staff will work in close partnership with GNN. We will share technology and services, and will collaborate on interesting new projects. However, the two Internet services will retain their own identities, and will continue to operate from their current sites.

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## Measuring the Web

In building a useful database of Web content, the WebCrawler learns a great deal about the structure of the Web. We are currently concentrating on three simple measures: determining the size of the Web, identifying what kinds of HTTP servers are in use, and showing what browsers are being used. These statistics are summarized in the following reports:

### Web Size

The Web has grown tremendously in size since we started the WebCrawler project a year and a half ago. WebCrawler's Web Size report gives our current estimate of the size of the Web, and shows how that has changed over time.

### HTTP Servers in use

The Web is powered by many different kinds of HTTP servers. The server report shows the distribution of Web servers on the Internet, and concludes that most of those are freely available Unix servers.

### Web browsers in use

As a heavily-trafficked Web site, the WebCrawler receives requests from a great many Web Browsers. The browser report summarizes this information by client platform and by browser type.

If you would like to include our data in a report or article, please reference the WebCrawler as the source.

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[info@webcrawler.com](mailto:info@webcrawler.com)

## WebCrawler Search Results

The query "arc/info data format" found 209 documents and returned 10:

- 100 Data Links
- 094 Data
- 076 ESRI White Papers On-Line
- 064 1995 Data Catalog
- 061 GRID-Arendal's Baltic GIS Database
- 059 USGS WRGIS Help Page
- 056 GLO EPA Wetland Resource Database-layers
- 045 SGID ONLINE
- 042 Welcome.html
- 042 Digital Chart of the World, Conterminous US Index

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[info@webcrawler.com](mailto:info@webcrawler.com)

## WebCrawler Search Results

The query "arc/info internal format" found 55 documents and returned 10:

- 100 Department of Applied Physics, WWW Home Page
- 084 Infotec GIS Services Home Page
- 069 Clearinghouse Cooperator's Page
- 065 GeoTIFF FAQ
- 053 Spatial Archive and Interchange Format (SAIF) FAQ Home Page
- 030 NCSA Tutorial: Imagemap
- 019 Programmers BBS file list. [HyperList (C)-95 Roger Moe]
- 019 Ellison's Art & Desktop Titles
- 019 3D Graphic Engines
- 019 Contents of IDL Astronomy User's Library

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## WebCrawler Search Results

The query "arc/info export format" found 52 documents and returned 10:

- 100 USGS WRGIS Oregon Page
- 094 Data Links
- 072 USGS WRGIS Help Page
- 062 GRID-Arendal's Baltic GIS Database
- 038 SAST Dataset List, GIS Data(Export Files) and Metadata, GIFS
- 033 ENR IGIS Home Page
- 031 Geographic Information System (GIS) Data Distribution Server
- 029 USGS WRGIS Tillamook, Oregon Page
- 025 Infotec GIS Services Home Page
- 024 1995 Data Catalog

[Get the next 10 results](#)

---

[info@webcrawler.com](mailto:info@webcrawler.com)

## WebCrawler Search Results

The query "arc/info generate format" found 64 documents and returned 10:

- 100 GRID-Arendal's Baltic GIS Database
- 040 [http://crusty.er.usgs.gov/coast/NOAA\\_readme](http://crusty.er.usgs.gov/coast/NOAA_readme)
- 024 ANUDEM VERSION 4.4
- 022 Lancaster FS5 Scenery
- 014 Tri-Service Spatial Data Standards (TSSDS)
- 012 Public SGML Software
- 012 Graphics viewers, editors, utilities and info
- 012 Public SGML Software
- 011 Graphics viewers, editors, utilities and info
- 011 *Graphics viewers, editors, utilities and info*

Get the next 10 results

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資料 4 米国ホームページ検索サービス (Yahoo! Search) による検索結果



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## Web Launch Program

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Need a place to announce a new web site or a big change on an existing web site? There's no better place than Yahoo! For an affordable price, you can drive traffic and gain the momentum that you need.

Show me what Web Launch looks like!

At a price of \$1000 for one week, you can get a screenshot (or logo) thumbnail sketch, a two line description and a link to your site from a highly trafficked page on Yahoo! This price is expected to rise as traffic to the Web Launch page increases. If you are interested, please follow the directions below. We will contact you to confirm the date that your site will appear on Web Launch.

### Directions for Reserving a Web Launch spot:

To reserve a spot on *Web Launch*, print out our order form page, fill it in and send it together with a check made out to Yahoo! Corporation, to:

Yahoo! Inc.  
Attention: Web Launch  
635 Vaqueros Ave,  
Sunnyvale, CA 94086

Tel: (408) 328-3300  
Fax: (408) 328-3301

If you have any questions about the form or about Web Launch, send email to: [weblaunch@yahoo.com](mailto:weblaunch@yahoo.com)

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## Yahoo Search Results

Found 2,343 pages containing: arc And info And data And format. Displaying matches 1-2.

1. World-Wide Web Access Statistics for www.csc.ncsu.edu (score: 10342, size: 1321.2k)  
From: [http://www.csc.ncsu.edu/statistics/stat\\_files/Jun.wwwstats.html](http://www.csc.ncsu.edu/statistics/stat_files/Jun.wwwstats.html)
  1. Totals for Summary Period: Jun 30 1995 to Jun 1...
  2. Daily Transmission Statistics
  3. Hourly Transmission Statistics<
2. .mirror (score: 6429, size: 617.6k)  
From: <ftp://ftp.amug.org/pub/mirrors/info-mac/.mirror>  
mirroring info-mac (sumex-aim.stanford.edu:/info-mac) completed successfully @ Wed Oct 12 13:46:30 MST 1994 NEED TO rmdir /ftp/mnt/ftp1/info-mac/snd NEED TO rmdir /ftp/mnt/ftp1/info-mac/app mirroring info-mac (sumex-aim.stanford.edu:/info-mac) completed succ
3. psdd.txt (score: 4451, size: 623.1k)  
From: <http://stardust.jpl.nasa.gov/psdd/psdd.txt>  
Object Alias List Alias Name: Is Alias for: bitcolumn bit\_column cube qube data\_set\_map\_project\_catalog data\_set\_map\_projection dataset data\_set datasetinfo data\_set\_information datasetarg data\_set\_target discd discipline\_description ds\_map\_proj\_ref\_info\_ca
4. ALL\_FILES (score: 4207, size: 577.3k)  
From: [http://www.funet.fi/pub/dx/files/ALL\\_FILES](http://www.funet.fi/pub/dx/files/ALL_FILES)  
Dec 08 16:02 1993 pub/dx/: dx-adm@ftp.funet.fi 0 Dec 08 16:03 1993 pub/dx/: Maintainers' address is 991580 Mar 04 04:24 1995 pub/dx/files/ALL\_FILES 991580 Mar 04 04:35 1995 pub/dx/files/FILES\_by\_date 37437 Mar 04 04:35 1995 pub/dx/files/NON\_FILES 90635 Mar 0
5. info.umd.edu Home Page (score: 3938, size: 462.5k)  
From: <gopher://info.umd.edu:1800/00/NewData>
  - 1.
  - 2.
  - 3.
6. info.umd.edu Home Page (score: 3372, size: 328.0k)  
From: <gopher://info.umd.edu:1800/h0/SoftwareLib>
  - 1.
  - 2.
  - 3.
7. SDTS format data available/Digital Line Graph data available in SDTS format (score: 3244, size: 3.5k)  
From: <http://www-nmd.usgs.gov/esic/sdtsnews.html>  
The U.S. Geological Survey (USGS) has released its 1:100,000-scale vector data in Spatial Data Transfer Standard (SDTS) format. The entire data base of 1:100,000-scale transportation and hydrography digital cartographic data is now available via the Internet
8. Introductory PC ARC/INFO Certificate Course (score: 2415, size: 2.6k)  
From: <http://flash.lakeheadu.ca/~regwww/caris/intro.html>  
Date: April 24 - May 5, 1995  
Format: 10 day (Monday to Friday) hands on course in a 486PC enviroment. The course will focus on OBM and FRI data structures. <
9. Table of Contents (score: 1948, size: 205.4k)  
From: <http://info.risc.uni-linz.ac.at/about/TOC-www.html>  
Welcome to RISC Images Bruno Buchberger, the head of the institute The castle Inside the castle How to find the institute The history of the Castle Maps of the Castle 0.1: Entrance Hall 0.2: 0.3: 0.4: 0.5: 0.6: Machine Room 0.7: Parallel Computation Lab 0.12
10. SPDS-MOLD Data by Type/The Magnetospheric Yellow Pages (score: 1895, size: 62.2k)  
From: <http://leadbelly.lanl.gov/spds/data-by-type.html>  
Data Servers by Data Type
  1. List of Data Types
  2. AMPTE<

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Other Search Engines

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## Yahoo Search Results

Found 963 pages containing: arc Andinfo Andinternal Andformat. Displaying matches 1-10.

1. Table of Contents (score: 1945, size: 205.4k)  
From: <http://info.risc.uni-linz.ac.at/about/TOC-www.html>  
Welcome to RISC Images Bruno Buchberger, the head of the institute The castle Inside the castle How to find the institute The history of the Castle Maps of the Castle 0.1: Entrance Hall 0.2: 0.3: 0.4: 0.5: 0.6: Machine Room 0.7: Parallel Computation Lab 0.12
2. Table of Contents (score: 1877, size: 203.0k)  
From: <http://info.risc.uni-linz.ac.at:70/0h/about/TOC-www.html>  
Welcome to RISC Images Bruno Buchberger, the head of the institute The castle Inside the castle How to find the institute The history of the Castle Maps of the Castle 0.1: Entrance Hall 0.2: 0.3: 0.4: 0.5: 0.6: Machine Room 0.7: Parallel Computation Lab 0.12
3. index (score: 1520, size: 1211.6k)  
From: <http://128.214.248.6/pub/misc/archive/index>  
Change to posting format intro Introduction to comp.sources.atari.st Patch1 travesty/Patch1 travesty - make a travesty of the input, Patch1 me-etags me-etags Etags for MicroEmacs brkdig brkdig - break mailing list digest into USENET messages par
4. Graphics File Formats FAQ (Part 1 of 4): General Graphics Format Questions (REPOST) (score: 1478, size: 92.6k)  
From: <http://www.uni-konstanz.de/misc/faqs/msg00072.html>  
file formats, including, raster, vector, metafile, Page Description Language, 3D object, animation, and multimedia formats. This FAQ is divided into four parts, each covering a different area of graphics file format information: Graphics File Formats FAQ (Pa
5. Graphics File Formats FAQ (Part 1 of 4): General Graphics Format Questions (score: 1465, size: 79.0k)  
From: <http://www.uni-konstanz.de/misc/faqs/msg00078.html>  
file formats, including, raster, vector, metafile, Page Description Language, 3D object, animation, and multimedia formats. This FAQ is divided into four parts, each covering a different area of graphics file format information: Graphics File Formats FAQ (Pa
6. Graphics File Formats FAQ (Part 1 of 4): General Graphics Format Questions (score: 1272, size: 87.3k)  
From: <http://math-www.uio.no/faq/graphics/fileformats-faq/part1.html>  
Date: Mon, 6 Nov 1995 03:00:42 GMT  
This is an USENET Frequently Asked Questions with answersfrom news.answers.
7. Graphics File Formats FAQ (Part 1 of 4): General Graphics Format Questions (REPOST) (score: 1267, size: 86.0k)  
From: <http://math-www.uio.no/faq/graphics/fileformats-faq.html>  
Date: Thu, 7 Sep 1995 04:54:29 GMT  
This is an USENET Frequently Asked Questions with answersfrom news.answers.
8. archive.log (score: 1186, size: 754.7k)  
From: <http://www.funet.fi/pub/archive/archive.log>  
Change to posting format intro Introduction to comp.sources.atari.st Patch1 travesty - make a travesty of the input, Patch1 me-etags Etags for MicroEmacs brkdig brkdig - break mailing list digest into USENET messages part03 newsclip 1.1, part 3 of 15 chgrp\_a
9. WWW\_title.html (score: 1050, size: 759.4k)  
From: [http://www.cs.colorado.edu/home/mcbryan/WWW\\_title.html](http://www.cs.colorado.edu/home/mcbryan/WWW_title.html)  
Salzburgラジオ日本とは !mod newsgroups !pubnet newsgroups !unix-pc newsgroups ( 鰲 駄鶏糞 . 鰲  
蓑菜よ瑟 駄 - よ (13sep93) Welcome to comp.windows.x.pex! (FAQ) (No title) (No title)  
/local\_web/dumand/acoustics/acoustic\_d
10. WWW\_title.html (score: 1050, size: 751.9k)  
From: [http://www.cs.colorado.edu/home/mcbryan/WWW\\_title.html](http://www.cs.colorado.edu/home/mcbryan/WWW_title.html)  
Salzburgラジオ日本とは !mod newsgroups !pubnet newsgroups !unix-pc newsgroups ( 鰲 駄鶏糞 . 鰲  
蓑菜よ瑟 駄 - よ (13sep93) Welcome to comp.windows.x.pex! (FAQ) (No title) (No title)  
/local\_web/dumand/acoustics/acoustic\_d

Next 10 matches

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### Other Search Engines

Open Text | Alta Vista | Lycos | WebCrawler | Inktomi | DejaNews | More...



## Yahoo Search Results

Found 584 pages containing: arc And info And export And format. Displaying matches 1-10.

1. info.umd.edu Home Page (score: 3925, size: 462.5k)  
From: gopher://info.umd.edu:1800/00/NewData  
1.  
2.  
3.
2. info.umd.edu Home Page (score: 3366, size: 328.0k)  
From: gopher://info.umd.edu:1800/h0/SoftwareLib  
1.  
2.  
3.
3. Summary of Export Problems in GRASS EXPORT (score: 2427, size: 6.5k)  
From: http://boeuf.ucdavis.edu:8001/root/docs/help/problems.etx  
1. Filesystem Problems  
2. DXF Problem  
3. DLG Problem<
4. EMAP Format Standards/Document Format Standards (score: 1714, size: 0.8k)  
From: http://134.67.99.11/emap/html/formats.html  
WordPerfect V5.1  
This is EPA's standard document format. Other formats have been made available to provide enhanced usability by the public. <
5. EMAP Format Standards/Document Format Standards (score: 1714, size: 0.8k)  
From: http://134.67.99.11/emap/html/formats.html  
WordPerfect V5.1  
This is EPA's standard document format. Other formats have been made available to provide enhanced usability by the public. <
6. Graphics File Formats FAQ (Part 1 of 4): General Graphics Format Questions (REPOST) (score: 1477, size: 92.6k)  
From: http://www.uni-konstanz.de/misc/faqs/msg00072.html  
file formats, including, raster, vector, metafile, Page Description Language, 3D object, animation, and multimedia formats. This FAQ is divided into four parts, each covering a different area of graphics file format information: Graphics File Formats FAQ (Pa
7. Graphics File Formats FAQ (Part 1 of 4): General Graphics Format Questions (score: 1464, size: 79.0k)  
From: http://www.uni-konstanz.de/misc/faqs/msg00078.html  
file formats, including, raster, vector, metafile, Page Description Language, 3D object, animation, and multimedia formats. This FAQ is divided into four parts, each covering a different area of graphics file format information: Graphics File Formats FAQ (Pa
8. index (score: 1442, size: 1211.6k)  
From: http://128.214.248.6/pub/misc/archive/index  
Change to posting format intro intro Introduction to comp.sources.atari.st Patch1 travesty/Patch1 travesty - make a travesty of the input, Patch1 me-etags me-etags Etags for MicroEmacs brkdig brkdig brkdig - break mailing list digest into USENET messages par
9. SAST Dataset List, GIS Data(Export Files) and Metadata, GIFS/SAST Datasets Available for FTP Access (score: 1330, size: 9.3k)  
From: http://edcwww2.cr.usgs.gov/dslist.html  
1.1. The SAST Data set list shows the data themes available,...  
1.2. View example graphic (Gif)  
1.3. FTP Data (ARC Export Files)<
10. Graphics File Formats FAQ (Part 1 of 4): General Graphics Format Questions (score: 1271, size: 87.3k)  
From: http://math-www.uio.no/faq/graphics/fileformats-faq/part1.html  
Date: Mon, 6 Nov 1995 03:00:42 GMT  
This is an USENET Frequently Asked Questions with answersfrom news.answers.

Next 10 matches

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Other Search Engines  
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## Yahoo Search Results

Found 800 pages containing: arc And info And generate And format. Displaying matches 1-10.

1. info.umd.edu Home Page (score: 3924, size: 462.5k)  
From: gopher://info.umd.edu:1800/00/NewData  
1.  
2.  
3.
2. info.umd.edu Home Page (score: 3365, size: 328.0k)  
From: gopher://info.umd.edu:1800/h0/SoftwareLib  
1.  
2.  
3.
3. Table of Contents (score: 2037, size: 205.4k)  
From: http://info.risc.uni-linz.ac.at/about/TOC-www.html  
Welcome to RISC Images Bruno Buchberger, the head of the institute The castle Inside the castle How to find the institute The history of the Castle Maps of the Castle 0.1: Entrance Hall 0.2: 0.3: 0.4: 0.5: 0.6: Machine Room 0.7: Parallel Computation Lab 0.12
4. Table of Contents (score: 1970, size: 203.0k)  
From: http://info.risc.uni-linz.ac.at:70/0h/about/TOC-www.html  
Welcome to RISC Images Bruno Buchberger, the head of the institute The castle Inside the castle How to find the institute The history of the Castle Maps of the Castle 0.1: Entrance Hall 0.2: 0.3: 0.4: 0.5: 0.6: Machine Room 0.7: Parallel Computation Lab 0.12
5. index (score: 1454, size: 1211.6k)  
From: http://128.214.248.6/pub/misc/archive/index  
Change to posting format intro intro Introduction to comp.sources.atari.st Patch1 travesty/Patch1 travesty - make a travesty of the input, Patch1 me-etags me-etags Etags for MicroEmacs brkdig brkdig brkdig - break mailing list digest into USENET messages par
6. Simple Offline USENET Packet Format (SOUP) Version 1.2 (score: 1163, size: 43.0k)  
From: http://www.gatech.edu/acm/soup12.html  
1. DISTRIBUTION  
2. INTRODUCTION  
3. REVISION HISTORY<
7. alt.binaries.pictures FAQ - OS specific info (score: 1156, size: 59.1k)  
From: http://math-www.uio.no/faq/pictures-faq/part3.html  
Date: Mon, 23 Oct 1995 08:30:37 GMT  
This is an USENET Frequently Asked Questions with answersfrom news.answers.
8. comp.fonts FAQ: General Info (2/6) (score: 1143, size: 53.1k)  
From: http://www.math.uio.no/faq/fonts-faq/part2.html  
Date: 15 Jun 1995 06:27:29 -0400  
This is an USENET Frequently Asked Questions with answersfrom news.answers.
9. comp.fonts FAQ: General Info (2/6) (score: 1142, size: 52.5k)  
From: http://www.cis.ohio-state.edu/hypertext/faq/usenet/fonts-faq/part2/faq.html  
This topic is hotly debated at regular intervals on comp.fonts. Terry Carroll. provides the following analysis of current [ed: as of 6/92] legislation and regulation regarding fonts and copyrights in the United States. Terry is "Editor in Chief" of Volume 10
10. Metafont: All fonts available in .mf format (score: 1115, size: 30.5k)  
From: http://www.math.uio.no/faq/fonts-faq/metafont-list.html  
Date: Fri, 24 Nov 1995 23:06:24 GMT  
This is an USENET Frequently Asked Questions with answersfrom news.answers.

Next 10 matches

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Other Search Engines  
Open Text ! Alta Vista ! Lycos ! WebCrawler ! Inktomi ! DejaNews ! More...

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## Yahoo Search Results

Found 488 pages containing: arc And info And shape And format. Displaying matches 1-10.

1. index (score: 1441, size: 1211.6k)  
From: <http://128.214.248.6/pub/misc/archive/index>  
Change to posting format into intro Introduction to comp.sources.atari.st Patch1 travesty/Patch1 travesty - make a travesty of the input, Patch1 me-etags me-etags Etags for MicroEmacs brkdig brkdig brkdig - break mailing list digest into USENET messages par
2. comp.fonts FAQ: General Info (2/6) (score: 1147, size: 53.1k)  
From: <http://www.math.uio.no/faq/fonts-faq/part2.html>  
Date: 15 Jun 1995 06:27:29 -0400  
This is an USENET Frequently Asked Questions with answers from news.answers.
3. comp.fonts FAQ: General Info (2/6) (score: 1146, size: 52.5k)  
From: <http://www.cis.ohio-state.edu/hypertext/faq/usenet/fonts-faq/part2/faq.html>  
This topic is hotly debated at regular intervals on comp.fonts. Terry Carroll. provides the following analysis of current [ed: as of 6/92] legislation and regulation regarding fonts and copyrights in the United States. Terry is "Editor in Chief" of Volume 10
4. archive.log (score: 1107, size: 754.7k)  
From: <http://www.funet.fi/pub/archive/archive.log>  
Change to posting format into Introduction to comp.sources.atari.st Patch1 travesty - make a travesty of the input, Patch1 me-etags Etags for MicroEmacs brkdig brkdig - break mailing list digest into USENET messages part03 newsclip 1.1, part 3 of 15 chgrp\_a
5. Volume 13 : Issue 68 (score: 948, size: 202.0k)  
From: <http://dutera.et.tudelft.nl/people/vdham/info-mac/IM68-13.html>  
Info-Mac Digest Thu, 22 Jun 95 Volume 13 : Issue 68 Today's Topics: [\*] "I Want U" by Rosie Gaines; a sound sample [\*] 3D Buttons INIT/cdev [\*] Aaron 1.0b2 -- Copland Preview [\*] Anagram Crossword 15; a game aid [\*] BBEdit HTML extensions release 10 [\*] c++
6. psdd.txt (score: 948, size: 623.1k)  
From: <http://stardust.jpl.nasa.gov/psdd/psdd.txt>  
Object Alias List Alias Name: Is Alias for: bitcolumn bit\_column cube qube data\_set\_map\_project\_catalog data\_set\_map\_projection dataset data\_set datasetinfo data\_set\_information datasetarg data\_set\_target discd discipline\_description ds\_map\_proj\_ref\_info\_ca
7. FILES.bysize (score: 807, size: 1888.5k)  
From: <ftp://ftp.shsu.edu/tex-archive/FILES.bysize>  
systems/unix/sco/SCOGNU.tar.gz 1993/06/29 ; 17932264 ; systems/unix/sco/SCOTEX.tar.gz 1995/03/16 ; 10985472 ; fonts/ams/amsfonts600.tar 1994/04/08 ; 9550822 ; systems/unix/aix3.2/TeX3.141.tar.gz 1995/03/17 ; 7217152 ; fonts/ams/amsfonts400.tar 1994/04/21 ; 7
8. Volume 13 : Issue 61 (score: 750, size: 125.3k)  
From: <http://www-chem.ucdavis.edu/mac/v13/IMP61-13.html>  
Date: Fri, 26 May 1995 17:10:09 -0500  
Make FTP connection with: SUMEX
9. Volume 13 : Issue 68 (score: 599, size: 108.3k)  
From: <http://www-chem.ucdavis.edu/mac/v13/IMP68-13.html>  
Date: Mon, 19 Jun 1995 12:16:08 -0600  
Make FTP connection with: SUMEX
10. Volume 13 : Issue 53 (score: 584, size: 126.3k)  
From: <http://dutera.et.tudelft.nl/people/vdham/info-mac/IM53-13.html>  
Date: Mon, 1 May 1995 23:27:12 -0500  
Today's Topics:

Next 10 matches

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### Other Search Engines

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資料 5 ArcView Version2 Shapefile Technical Description

# ArcView Version 2 Shapefile Technical Description

ArcView® Version 2 software introduces a new data file format that can be used by ArcView called a shapefile. This document defines this new spatial data format and describes why shapefiles are important. It lists the tools available in ESRI software for creating shapefiles directly or converting data into shapefiles from other formats. This document also provides all the technical information necessary for writing a computer program to create shapefiles without the use of ArcView or other ESRI software for organizations that want to write their own data translators.

## Why Shapefiles?

A shapefile stores nontopological geometry and attribute information for the spatial features in a data set. The geometry for a feature is stored as a shape comprising a set of vector coordinates.

Because shapefiles do not have the processing overhead of a topological data structure, they have advantages over other data sources, such as faster drawing speed and edit ability. Shapefiles handle single features that overlap or that are noncontiguous. They also typically require less disk space and are easier to read and write. ArcView uses shapefiles just as it uses coverages—as a data source for a feature theme. The rest of the software functionality is identical for both shapefiles and coverages.

Shapefiles support data editing functions in ArcView Version 2. Shapefiles can support point, line, and area features. Area features are represented as closed loop, double-digitized polygons. Attributes are held in a dBASE® format file. Each attribute record has a one-to-one relationship with the associated shape record.

### How Shapefiles Can Be Created

Shapefiles can be created with the following four general methods:

- Export from ArcView Version 2. Shapefiles can be created in ArcView Version 2 by exporting any theme to a shapefile.
- Digitize in ArcView Version 2. Shapefiles can be created directly by digitizing shapes using ArcView Version 2 feature-creation tools.
- Use the Avenue API. The Avenue Applications Programming Interface (API) provides tools to write shapefiles from another data source. For example, the script GPS2SHP reads coordinates from an ASCII file to create shapefiles with points, lines or polygons. A more complex example is the script MIF2SHP which uses the Avenue API to create shapefiles from data in MapInfo format. (These scripts, and others, are distributed with Avenue in the sample script library.)
- Write to the file specifications. Write directly to the shapefile specifications by creating a program.

ARC/INFO, PC ARC/INFO®, and ArcCAD® software provides shape-to-coverage data translators, and ARC/INFO also provides a coverage-to-shape translator. For exchange with other data formats, the shapefile specifications are published in this paper. Other data streams, such as those from global positioning system (GPS) receivers, can also be stored as shapefiles or XY event tables.

### Shapefile Technical Description

Computer programs can be created to read or write shapefiles using the technical specification in this section.

An ArcView shapefile consists of a main file, an index file, and a dBASE table. The main file is a direct access, variable-record-length file in which each record describes a shape with a list of its vertices. In the index file, each record contains the offset of the corresponding main file record from the beginning of the main file. The dBASE table contains feature attributes with one record per feature. The one-to-one relationship between geometry and attributes is based on record number. Attribute records in the dBASE file must be in the same order as records in the main file.

## Naming Conventions

All file names adhere to the 8.3 naming convention. The main file, the index file, and the dBASE file have the same prefix. The suffix for the main file is ".shp". The suffix for the index file is ".shx". The suffix for the dBASE table is ".dbf".

### *Examples*

- main file: counties.shp
- index file: counties.shx
- dBASE table: counties.dbf

## Numeric Types

A shapefile stores integer and double precision numbers. The remainder of this document will refer to the following types:

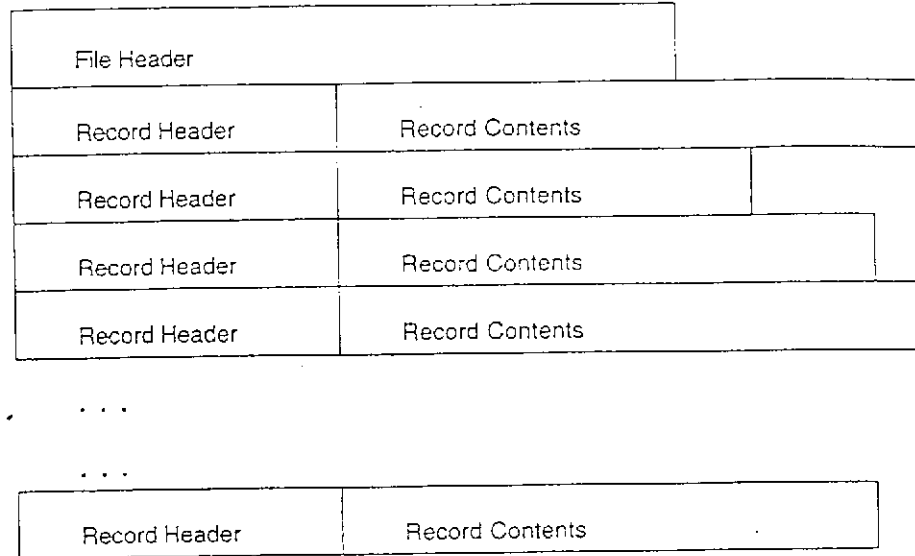
- Integer: Signed 32-bit integer (4 bytes)
- Double: Signed 64-bit IEEE double precision floating point number (8 bytes)

The first section below describes the general structure and organization of the shapefile. The second section describes the record contents for each type of shape supported in the shapefile.

## Organization of the Main File

The main file contains a fixed-length file header followed by variable-length records. Each variable-length record is made up of a fixed-length record header followed by variable-length record contents. Figure 1 illustrates the main file organization.

Figure 1  
Organization of the Main File



### Byte Order

The integers and double-precision integers that make up the data description fields in the file header (identified below) and record contents in the main file are in little endian (PC or Intel®) byte order. The integers and double-precision floating point numbers that make up the rest of the file are in big endian (Sun® or Motorola®) byte order.

### The Main File Header

The main file header is 100 bytes long. Table 1 shows the fields in the file header with their byte position, value, type, and byte order. In the table, position is with respect to the start of the file.

The value for file length is the total length of the file in 16-bit words (including the fifty 16-bit words that make up the header).

Table 1  
Description of the Main File Header

Position	Field	Value	Type	Byte Order
Byte 0	File Code	9994	Integer	Big
Byte 4	Unused	0	Integer	Big
Byte 8	Unused	0	Integer	Big
Byte 12	Unused	0	Integer	Big
Byte 16	Unused	0	Integer	Big
Byte 20	Unused	0	Integer	Big
Byte 24	File Length	File Length	Integer	Big
Byte 28	Version	1000	Integer	Little
Byte 32	Shape Type	Shape Type	Integer	Little
Byte 36	Bounding Box	Xmin	Double	Little
Byte 44	Bounding Box	Ymin	Double	Little
Byte 52	Bounding Box	Xmax	Double	Little
Byte 60	Bounding Box	Ymax	Double	Little
Byte 68	Unused	0	Integer	Big
.	.	.	.	.
.	.	.	.	.
Byte 96	Unused	0	Integer	Big

All the shapes in a shapefile are required to be of the same shape type. The values for shape type are as follows:

Value	Shape Type
0	Null Shape
1	Point
3	Arc
5	Polygon
8	MultiPoint

Shape types 2, 4, 6, 7, and 9 are reserved for future use and not presently specified. Currently, shapefiles are restricted to contain the same type of shape as specified above. In the future, shapefiles may be allowed to contain more than one shape type. If mixed shape types

are implemented, the shape type field in the header will flag the file as such.

The Bounding Box in the main file header stores the actual extent of the shapes in the file: the minimum bounding rectangle orthogonal to the X and Y axes that contains all shapes.

**Record Headers** The header for each record stores the record number and content length for the record. Record headers have a fixed length of 8 bytes. Table 2 shows the fields in the file header with their byte position, value, type, and byte order. In the table, position is with respect to the start of the file.

**Table 2**  
**Description of Main File Record Headers**

Position	Field	Value	Type	Byte Order
Byte 0	Record Number	Record Number	Integer	Big
Byte 4	Content Length	Content Length	Integer	Big

Record numbers begin at 1.

The content length for a record is the length of the record contents section measured in 16-bit words. Each record, therefore, contributes (4 + content length) 16-bit words toward the total length of the file, as stored at Byte 24 in the File Header.

### Main File Record Contents

Shapefile record contents consist of a shape type followed by the geometric data for the shape. The length of the record contents depends on the number of parts and vertices in a shape. For each shape type, we first describe the shape and then its mapping to record contents on disk. In Tables 3 through 6, position is with respect to the start of the record contents. A shape type of 0 indicates a null shape, with no geometric data for the shape.

**Point** A point consists of a pair of double-precision coordinates in the order X, Y.

```
Point
{
    Double      X      // X coordinate
    Double      Y      // Y coordinate
}
```

Table 3  
Point Record Contents

Position	Field	Value	Type	Number	Byte Order
Byte 0	Shape Type	1	Integer	1	Little
Byte 4	X	X	Double	1	Little
Byte 12	Y	Y	Double	1	Little

**MultiPoint** A MultiPoint represents a set of points, as follows:

```
MultiPoint
{
    Double[4]    Box      // Bounding Box
    Integer      NumPoints // Number of Points
    Point[NumPoints] Points // The Points in the set
}
```

The bounding box is stored in the order Xmin, Ymin, Xmax, Ymax.

Table 4  
MultiPoint Record Contents

Position	Field	Value	Type	Number	Byte Order
Byte 0	Shape Type	8	Integer	1	Little
Byte 4	Box	Box	Double	4	Little
Byte 36	NumPoints	NumPoints	Integer	1	Little
Byte 40	Points	Points	Point	NumPoints	Little

**Arc** A shapefile arc can consist of multiple PolyLines that are not necessarily connected to each other. A PolyLine is an ordered set of vertices. Each PolyLine is referred to as a part of the arc.

```
Arc
{
  Double[4]      Box      // Bounding Box
  Integer        NumParts // Number of Parts
  Integer        NumPoints // Total Number of Points
  Integer[NumParts] Parts // Index to first Point in Part
  Point[NumPoints] Points // Points for all parts
}
```

The fields for an arc are described in detail below:

**Box:** The bounding box for the arc stored in the order Xmin, Ymin, Xmax, Ymax.

**NumParts:** The number of PolyLines in the arc.

**NumPoints:** The total number of points for all PolyLines.

**Parts:** An array of length NumParts. Stores, for each PolyLine, the index of its first point in the points array. Array indexes are with respect to 0.

**Points:** An array of length NumPoints. The points for each PolyLine in the arc are stored end to end. The points for PolyLine 2 follow the points for PolyLine 1, and so on. The parts array holds the array index of the starting point for each PolyLine. There is no delimiter in the points array between PolyLines.

Table 5  
Arc Record Contents

Position	Field	Value	Type	Number	Byte Order
Byte 0	Shape Type	3	Integer	1	Little
Byte 4	Box	Box	Double	4	Little
Byte 36	NumParts	NumParts	Integer	1	Little
Byte 40	NumPoints	NumPoints	Integer	1	Little
Byte 44	Parts	Parts	Integer	NumParts	Little
Byte X	Points	Points	Point	NumPoints	Little

Note:  $X = 44 + 4 \cdot \text{NumParts}$ .

**Polygon** A polygon consists of a number of rings. A ring is a closed, non-self-intersecting loop. A polygon may contain multiple outer rings. The order of vertices or orientation for a ring indicates which side of the ring is interior of the polygon. The neighborhood to the right of an observer walking along the ring in vertex order is the neighborhood inside the polygon. Vertices for a single, ringed polygon are, therefore, always in clockwise order. The rings of a polygon are referred to as its parts.

The polygon structure is identical to the arc structure, as follows:

Polygon

```
{
    Double[4]      Box          // Bounding Box
    Integer        NumParts     // Number of Parts
    Integer        NumPoints    // Total Number of Points
    Integer[NumParts] Parts    // Index to first Point in Part
    Point[NumPoints] Points    // Points for all Parts
}
```

The fields for a polygon are described in detail below:

**Box:** The bounding box for the polygon stored in the order Xmin, Ymin, Xmax, Ymax.

**NumParts:** The number of rings in the polygon.

- NumPoints:** The total number of points for all rings.
- Parts:** An array of length NumParts. Stores, for each ring, the index of its first point in the points array. Array indexes are with respect to 0.
- Points:** An array of length NumPoints. The points for each ring in the polygon are stored end to end. The points for Ring 2 follow the points for Ring 1, and so on. The parts array holds the array index of the starting point for each ring. There is no delimiter in the points array between rings.

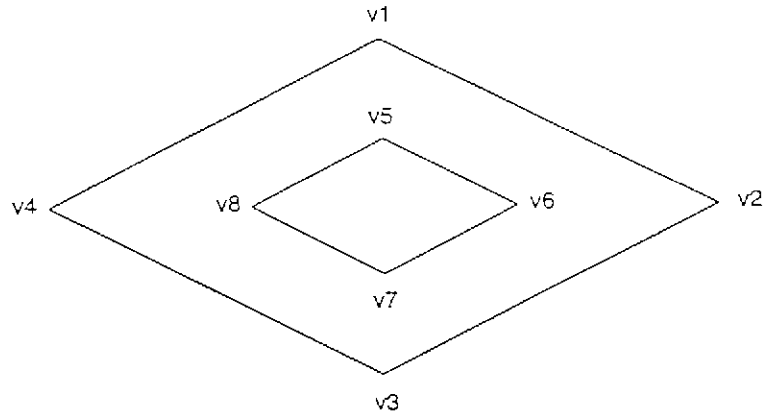
The instance diagram in **Figure 2** illustrates the representation of polygons.

The following are important notes about Polygon shapes.

- The rings are closed (the first and last vertex of a ring **MUST** be the same).
- The order of rings in the points array is not significant.
- Polygons stored in a shapefile must be clean. The rings of a polygon cannot have overlapping interiors or segments that intersect each other. In other words, a segment belonging to one ring may not intersect a segment belonging to another ring. The rings of a polygon can touch each other at vertices, but not along segments.

Figure 2  
An Example Polygon Instance

This figure shows a polygon with one hole and a total of eight vertices.



For this example, NumParts equals 2 and NumPoints equals 10.

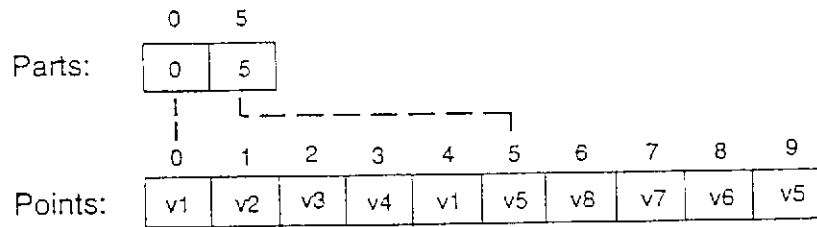


Table 6  
Polygon Record Contents

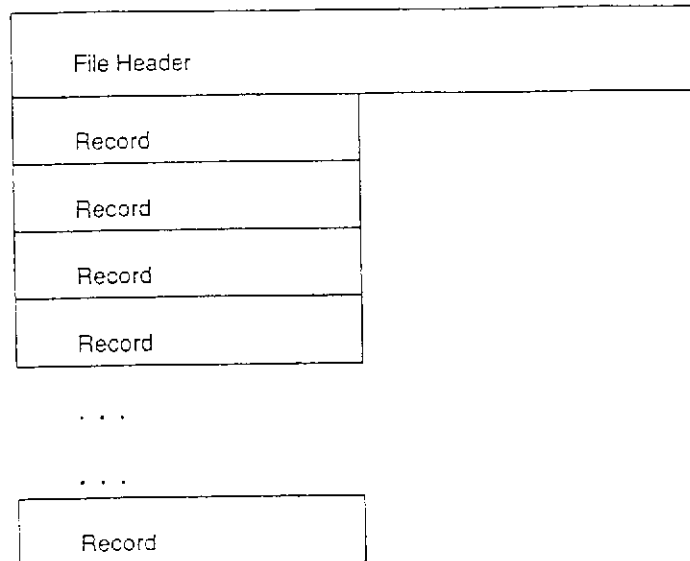
Position	Field	Value	Type	Number	Byte Order
Byte 0	Shape Type	5	Integer	1	Little
Byte 4	Box	Box	Double	4	Little
Byte 36	NumParts	NumParts	Integer	1	Little
Byte 40	NumPoints	NumPoints	Integer	1	Little
Byte 44	Parts	Parts	Integer	NumParts	Little
Byte X	Points	Points	Point	NumPoints	Little

Note: X = 44 + 4 \* NumParts.

## Organization of the Index File

The index file contains a 100-byte header followed by 8-byte, fixed-length records. Figure 3 illustrates the index file organization.

Figure 3  
Organization of the Index File



## The Index File Header

The index file header is identical in organization to the main file header described above. The file length stored in the index file header is the total length of the index file in 16-bit words (the fifty 16-bit words of the header plus 4 times the number of records).

## Index Records

The  $I$ 'th record in the index file stores the offset and content length for the  $I$ 'th record in the main file. Table 7 shows the fields in the file header with their byte position, value, type, and byte order. In the table, position is with respect to the start of the index file record.

Table 7  
Description of Index Records

Position	Field	Value	Type	Byte Order
Byte 0	Offset	Offset	Integer	Big
Byte 4	Content Length	Content Length	Integer	Big

The offset of a record in the main file is the number of 16-bit words from the start of the main file to the first byte of the record header for the record. Thus, the offset for the first record in the main file is 50, given the 100-byte header.

The content length stored in the index record is the same as the value stored in the main file record header.

### Organization of the dBASE File

The dBASE file contains any desired feature attributes or attribute keys to which other tables can be joined. Its format is a standard DBF file used by many table-based applications in Windows™ and DOS. Any set of fields can be present in the table. There are three requirements, as follows:

- The file name must have the same prefix as the shape and index file. Its suffix must be ".dbf". (See the example on page 3, in Naming Conventions.)
- The table must contain one record per shape feature.
- The record order must be the same as the order of shape features in the main (\*.shp) file.

# Glossary

Key terms are defined below that will help you understand the concepts discussed in this document.

- ARC/INFO** ARC/INFO software is designed for users who require a complete set of tools for processing and manipulating spatial data, including digitizing, editing, coordinate management, network analysis, surface modeling, and grid cell based modeling. ARC/INFO operates on a large variety of workstations and minicomputers. Using open standards and client/server architecture, ARC/INFO can act as a GIS server for ArcView clients.
- ArcCAD** ArcCAD software brings the powerful functionality of ARC/INFO, the leading geographic information system (GIS) software, to AutoCAD, the leading Computer-Aided Design (CAD) software. ArcCAD adds GIS functionality such as geographic data entry and editing, selection and query, and spatial analysis and modeling. Data can be stored in either ARC/INFO or AutoCAD format.
- ArcView** ArcView software is a powerful, easy-to-use desktop GIS that gives you the power to visualize, explore, query, and analyze data spatially. ArcView operates in both Windows desktop environments as well as a large variety of workstations. In addition to acting as a stand-alone GIS, ArcView can intercommunicate with other applications. Two examples include interfacing with a global positioning system (GPS) receiver to collect map data interactively or using ARC/INFO as a server to execute sophisticated analysis.
- Avenue** Avenue software is an object-oriented programming language and development environment created for use with ArcView software. Avenue can be used to extend ArcView software's basic capabilities and customize ArcView for specific applications.

- big endian byte order** Left-to-right byte ordering of an integer word. This byte-ordering method is used on many UNIX systems including Sun, Hewlett-Packard®, IBM®, and Data General AViiON®.
- bounding box** A bounding box is a rectangle surrounding each shape (e.g., arc) that is just large enough to contain the entire shape. It is defined as Xmin, Ymin, Xmax, Ymax.
- coverage**
1. A digital version of a map forming the basic unit of vector data storage in ARC/INFO software. A coverage stores geographic features as primary features (such as arcs; nodes, polygons, and label points) and secondary features (such as tics, map extent, links, and annotation). Associated feature attribute tables describe and store attributes of the geographic features.
  2. A set of thematically associated data considered as a unit. A coverage usually represents a single theme such as soils, streams, roads, or land use.
- feature** A representation of a geographic feature which has both a spatial representation referred to as a "shape" and a set of attributes.
- index file** An ArcView shapefile index file is a file that allows direct access to records in the corresponding main file.
- little endian byte order** Right-to-left byte ordering of an integer word. This byte-ordering method is used on many operating file systems including DEC OSF/1™, DEC Open VMS™, MS-DOS®, and Windows NT™.
- MultiPoint** A single feature composed of a cluster of point locations and a single attribute record. The group of points represents the geographic feature.
- NumPoints** The count of the number of x,y vertices contained in a shape.

- PC ARC/INFO** PC ARC/INFO is a full-featured GIS for PC compatibles. Like ARC/INFO software, PC ARC/INFO is used by organizations around the world for automating, managing, and analyzing geographic information. Attributes describing geographic features are stored as tabular files in dBASE format.
- PolyLine** An ordered set of x,y vertices representing a line or boundary.
- ring** An ordered set of x,y vertices where the first vertex is the same location as the last vertex; a closed PolyLine or a polygon.
- shapefile** An ArcView data set used to represent a set of geographic features such as streets, hospital locations, trade areas, and ZIP Code boundaries. Shapefiles can represent point, line, or area features. Each feature in a shapefile represents a single geographic feature and its attributes.
- theme** A user-defined set of geographic features. Data sources for themes in ArcView include coverages, grids, images, and shapefiles. Theme properties include the data source name, attributes of interest, a data classification scheme, and drawing methodology.
- topology** The spatial relationships between connecting or adjacent coverage features (e.g., arcs, nodes, polygons, and points). For example, the topology of an arc includes its from- and to-nodes and its left and right polygons. Topological relationships are built from simple elements into complex elements: points (simplest elements) and arcs (sets of connected points) are used to represent more complex features such as areas (sets of connected arcs). Shapefiles do not explicitly record topology.
- Coverages represent geographic features as topological line graphs. Topology can be useful for many GIS modeling operations that do not require coordinates. For example, to find an optimal path between two points requires a list of the arcs that connect to each other and the cost to traverse each arc in each direction. Coordinates are only needed for drawing the path after it is calculated.

- vector** A Cartesian (i.e., x,y) coordinate-based data structure commonly used to represent geographic features. Each feature is represented as one or more vertices. Attributes are associated with the feature. Other data structures include raster (which associates attributes with a grid cell) and triangulated irregular networks (TINs) for surface representation.
- vertex** One of a set of ordered x,y coordinates that constitutes a line.

## 資料 6 dBASE .DBF File Structure

NUMBER : 2821  
 PRODUCT : Delphi  
 VERSION : All  
 OS : Windows  
 DATE : December 13, 1995

TITLE : dBASE .DBF File Structure

Sometimes it is necessary to delve into a dBASE table outside the control of the Borland Database Engine (BDE). For instance, if the .DBT file (that contains memo data) for a given table is irretrievably lost, the file will not be usable because the byte in the file header indicates that there should be a corresponding memo file. This necessitates toggling this byte to indicate no such accompanying memo file. Or, you may just want to write your own data access routine.

Below are the file structures for dBASE table files. Represented are the file structures as used for various versions of dBASE: dBASE III PLUS 1.1, dBASE IV 2.0, dBASE 5.0 for DOS, and dBASE 5.0 for Windows.

\*\*\*\*\*  
 The data file header structure for dBASE III PLUS table file.  
 \*\*\*\*\*

The table file header:  
 =====

Byte	Contents	Description
0	1 byte	Valid dBASE III PLUS table file (03h without a memo (.DBT file; 83h with a memo).
1-3	3 bytes	Date of last update; in YYMMDD format.
4-7	32-bit number	Number of records in the table.
8-9	16-bit number	Number of bytes in the header.
10-11	16-bit number	Number of bytes in the record.
12-14	3 bytes	Reserved bytes.
15-27	13 bytes	Reserved for dBASE III PLUS on a LAN.
28-31	4 bytes	Reserved bytes.
32-n	32 bytes each	Field descriptor array (the structure of this array is shown below)
n+1	1 byte	0Dh stored as the field terminator.

n above is the last byte in the field descriptor array. The size of the array depends on the number of fields in the table file.

Table Field Descriptor Bytes  
 =====

Byte	Contents	Description
0-10	11 bytes	Field name in ASCII (zero-filled).
11	1 byte	Field type in ASCII (C, D, L, M, or N).
12-15	4 bytes	Field data address (address is set in memory; not useful on disk).
16	1 byte	Field length in binary.
17	1 byte	Field decimal count in binary.
18-19	2 bytes	Reserved for dBASE III PLUS on a LAN.
20	1 byte	Work area ID.
21-22	2 bytes	Reserved for dBASE III PLUS on a LAN.
23	1 byte	SET FIELDS flag.
24-31	1 byte	Reserved bytes.

Table Records  
=====

The records follow the header in the table file. Data records are preceded by one byte, that is, a space (20h) if the record is not deleted, an asterisk (2Ah) if the record is deleted. Fields are packed into records without field separators or record terminators. The end of the file is marked by a single byte, with the end-of-file marker, an OEM code page character value of 26 (1Ah). You can input OEM code page data as indicated below.

Allowable Input for dBASE Data Types  
=====

Data Type	Data Input
C (Character)	All OEM code page characters.
D (Date)	Numbers and a character to separate month, day, and year (stored internally as 8 digits in YYYYMMDD format).
N (Numeric)	- . 0 1 2 3 4 5 6 7 8 9
L (Logical)	? Y y N n T t F f (? when not initialized).
M (Memo)	All OEM code page characters (stored internally as 10 digits representing a .DBT block number).

Binary, Memo, and OLE Fields And .DBT Files  
=====

Memo fields store data in .DBT files consisting of blocks numbered sequentially (0, 1, 2, and so on). The size of these blocks are internally set to 512 bytes. The first block in the .DBT file, block 0, is the .DBT file header.

Memo field of each record in the .DBF file contains the number of the block (in OEM code page values) where the field's data actually begins. If a field contains no data, the .DBF file contains blanks (20h) rather than a number.

When data is changed in a field, the block numbers may also change and the number in the .DBF may be changed to reflect the new location.

This information is from the Using dBASE III PLUS manual, Appendix C.

\*\*\*\*\*  
The data file header structure for dBASE IV 2.0 table file.  
\*\*\*\*\*

File Structure:  
=====

Byte	Contents	Meaning
0	1byte	Valid dBASE IV file; bits 0-2 indicate version number, bit 3 the presence of a dBASE IV memo file, bits 4-6 the presence of an SQL table, bit 7 the presence of any memo file (either dBASE III PLUS or dBASE IV).
1-3	3 bytes	Date of last update; formatted as YYYYMMDD.
4-7	32-bit number	Number of records in the file.
8-9	16-bit number	Number of bytes in the header.
10-11	16-bit number	Number of bytes in the record.
12-13	2 bytes	Reserved; fill with 0.
14	1 byte	Flag indicating incomplete transaction.
15	1 byte	Encryption flag.
16-27	12 bytes	Reserved for dBASE IV in a multi-user environment.
28	1 bytes	Production MDX file flag; 01H if there is an MDX, 00H if not.

29	1 byte	Language driver ID.
30-31	2 bytes	Reserved; fill with 0.
32-n*	32 bytes each	Field descriptor array (see below).
n + 1	1 byte	ODH as the field terminator.

\* n is the last byte in the field descriptor array. The size of the array depends on the number of fields in the database file.

The field descriptor array:  
=====

Byte	Contents	Meaning
0-10	11 bytes	Field name in ASCII (zero-filled).
11	1 byte	Field type in ASCII (C, D, F, L, M, or N).
12-15	4 bytes	Reserved.
16	1 byte	Field length in binary.
17	1 byte	Field decimal count in binary.
18-19	2 bytes	Reserved.
20	1 byte	Work area ID.
21-30	10 bytes	Reserved.
31	1 byte	Production MDX field flag; 01H if field has an index tag in the production MDX file, 00H if not.

Database records:  
=====

The records follow the header in the database file. Data records are preceded by one byte; that is, a space (20H) if the record is not deleted, an asterisk (2AH) if the record is deleted. Fields are packed into records without field separators or record terminators. The end of the file is marked by a single byte, with the end-of-file marker an ASCII 26 (1AH) character.

Allowable Input for dBASE Data Types:  
=====

Data Type	Data Input
C (Character)	All OEM code page characters.
D (Date)	Numbers and a character to separate month, day, and year (stored internally as 8 digits in YYYYMMDD format).
F (Floating point binary numeric)	- . 0 1 2 3 4 5 6 7 8 9
N (Binary coded decimal numeric)	- . 0 1 2 3 4 5 6 7 8 9
L (Logical)	? Y y N n T t F f (? when not initialized).
M (Memo)	All OEM code page characters (stored internally as 10 digits representing a .DBT block number).

Memo Fields And .DBT Files  
=====

Memo fields store data in .DBT files consisting of blocks numbered sequentially (0, 1, 2, and so on). SET BLOCKSIZE determines the size of each block. The first block in the .DBT file, block 0, is the .DBT file header.

Each memo field of each record in the .DBF file contains the number of the block (in OEM code page values) where the field's data actually begins. If a field contains no data, the .DBF file contains blanks (20h) rather than a number.

When data is changed in a field, the block numbers may also change and the number in the .DBF may be changed to reflect the new location.

This information is from the dBASE IV Language Reference manual, Appendix D.

\*\*\*\*\*  
 The data file header structure for dBASE 5.0 for DOS table file.  
 \*\*\*\*\*

The table file header:

=====

Byte	Contents	Description
0	1 byte	Valid dBASE for Windows table file; bits 0-2 indicate version number; bit 3 indicates presence of a dBASE IV or dBASE for Windows memo file; bits 4-6 indicate the presence of a dBASE IV SQL table; bit 7 indicates the presence of any .DBT memo file (either a dBASE III PLUS type or a dBASE IV or dBASE for Windows memo file).
1-3	3 bytes	Date of last update; in YYMMDD format.
4-7	32-bit number	Number of records in the table.
8-9	16-bit number	Number of bytes in the header.
10-11	16-bit number	Number of bytes in the record.
12-13	2 bytes	Reserved; filled with zeros.
14	1 byte	Flag indicating incomplete dBASE transaction.
15	1 byte	Encryption flag.
16-27	12 bytes	Reserved for multi-user processing.
28	1 byte	Production MDX flag; 01h stored in this byte if a production .MDX file exists for this table; 00h if no .MDX file exists.
29	1 byte	Language driver ID.
30-31	2 bytes	Reserved; filled with zeros.
32-n	32 bytes each	Field descriptor array (the structure of this array is shown below)
n+1	1 byte	0Dh stored as the field terminator.

n above is the last byte in the field descriptor array. The size of the array depends on the number of fields in the table file.

Table Field Descriptor Bytes

=====

Byte	Contents	Description
0-10	11 bytes	Field name in ASCII (zero-filled).
11	1 byte	Field type in ASCII (B, C, D, F, G, L, M, or N).
12-15	4 bytes	Reserved.
16	1 byte	Field length in binary.
17	1 byte	Field decimal count in binary.
18-19	2 bytes	Reserved.
20	1 byte	Work area ID.
21-30	10 bytes	Reserved.
31	1 byte	Production .MDX field flag; 01h if field has an index tag in the production .MDX file; 00h if the field is not indexed.

Table Records

=====

The records follow the header in the table file. Data records are preceded by one byte, that is, a space (20h) if the record is not deleted, an

asterisk (2Ah) if the record is deleted. Fields are packed into records without field separators or record terminators. The end of the file is marked by a single byte, with the end-of-file marker, an OEM code page character value of 26 (1Ah). You can input OEM code page data as indicated below.

Allowable Input for dBASE Data Types

=====

Data Type	Data Input
C (Character)	All OEM code page characters.
D (Date)	Numbers and a character to separate month, day, and year (stored internally as 8 digits in YYYYMMDD format).
F (Floating point binary numeric)	- . 0 1 2 3 4 5 6 7 8 9
N (Numeric)	- . 0 1 2 3 4 5 6 7 8 9
L (Logical)	? Y y N n T t F f (? when not initialized).
M (Memo)	All OEM code page characters (stored internally as 10 digits representing a .DBT block number).

Memo Fields And .DBT Files

=====

Memo fields store data in .DBT files consisting of blocks numbered sequentially (0, 1, 2, and so on). SET BLOCKSIZE determines the size of each block. The first block in the .DBT file, block 0, is the .DBT file header.

Each memo field of each record in the .DBF file contains the number of the block (in OEM code page values) where the field's data actually begins. If a field contains no data, the .DBF file contains blanks (20h) rather than a number.

When data is changed in a field, the block numbers may also change and the number in the .DBF may be changed to reflect the new location.

Unlike dBASE III PLUS, if you delete text in a memo field, dBASE 5.0 for DOS may reuse the space from the deleted text when you input new text. dBASE III PLUS always appends new text to the end of the .DBT file. In dBASE III PLUS, the .DBT file size grows whenever new text is added, even if other text in the file is deleted.

This information is from the dBASE for DOS Language Reference manual, Appendix C.

\*\*\*\*\*  
 The data file header structure for dBASE 5.0 for Windows table file.  
 \*\*\*\*\*

The table file header:

=====

Byte	Contents	Description
0	1 byte	Valid dBASE for Windows table file; bits 0-2 indicate version number; bit 3 indicates presence of a dBASE IV or dBASE for Windows memo file; bits 4-6 indicate the presence of a dBASE IV SQL table; bit 7 indicates the presence of any .DBT memo file (either a dBASE III PLUS type or a dBASE IV or dBASE for Windows memo file).
1-3	3 bytes	Date of last update; in YYYYMMDD format.
4-7	32-bit number	Number of records in the table.
8-9	16-bit	Number of bytes in the header.

10-11	number 16-bit	Number of bytes in the record.
12-13	number 2 bytes	Reserved; filled with zeros.
14	1 byte	Flag indicating incomplete dBASE IV transaction.
15	1 byte	dBASE IV encryption flag.
16-27	12 bytes	Reserved for multi-user processing.
28	1 byte	Production MDX flag; 01h stored in this byte if a production .MDX file exists for this table; 00h if no .MDX file exists.
29	1 byte	Language driver ID.
30-31	2 bytes	Reserved; filled with zeros.
32-n	32 bytes each	Field descriptor array (the structure of this array is shown below)
n+1	1 byte	0Dh stored as the field terminator.

n above is the last byte in the field descriptor array. The size of the array depends on the number of fields in the table file.

Table Field Descriptor Bytes  
=====

Byte	Contents	Description
0-10	11 bytes	Field name in ASCII (zero-filled).
11	1 byte	Field type in ASCII (B, C, D, F, G, L, M, or N).
12-15	4 bytes	Reserved.
16	1 byte	Field length in binary.
17	1 byte	Field decimal count in binary.
18-19	2 bytes	Reserved.
20	1 byte	Work area ID.
21-30	10 bytes	Reserved.
31	1 byte	Production .MDX field flag; 01h if field has an index tag in the production .MDX file; 00h if the field is not indexed.

Table Records  
=====

The records follow the header in the table file. Data records are preceded by one byte, that is, a space (20h) if the record is not deleted, an asterisk (2Ah) if the record is deleted. Fields are packed into records without field separators or record terminators. The end of the file is marked by a single byte, with the end-of-file marker, an OEM code page character value of 26 (1Ah). You can input OEM code page data as indicated below.

Allowable Input for dBASE Data Types  
=====

Data Type	Data Input
B (Binary)	All OEM code page characters (stored internally as 10 digits representing a .DBT block number).
C (Character)	All OEM code page characters.
D (Date)	Numbers and a character to separate month, day, and year (stored internally as 8 digits in YYYYMMDD format).
G (General)	All OEM code page characters (stored internally as 10 digits or OLE) representing a .DBT block number).
N (Numeric)	- . 0 1 2 3 4 5 6 7 8 9
L (Logical)	? Y y N n T t F f (? when not initialized).
M (Memo)	All OEM code page characters (stored internally as 10 digits representing a .DBT block number).

Binary, Memo, and OLE Fields And .DBT Files  
=====

Binary, memo, and OLE fields store data in .DBT files consisting of blocks numbered sequentially (0, 1, 2, and so on). SET BLOCKSIZE determines the size of each block. The first block in the .DBT file, block 0, is the .DBT file header.

- Each binary, memo, or OLE field of each record in the .DBF file contains the number of the block (in OEM code page values) where the field's data actually begins. If a field contains no data, the .DBF file contains blanks (20h) rather than a number.

When data is changed in a field, the block numbers may also change and the number in the .DBF may be changed to reflect the new location.

Unlike dBASE III PLUS, if you delete text in a memo field (or binary and OLE fields), dBASE for Windows (unlike dBASE IV) may reuse the space from the deleted text when you input new text. dBASE III PLUS always appends new text to the end of the .DBT file. In dBASE III PLUS, the .DBT file size grows whenever new text is added, even if other text in the file is deleted.

This information is from the dBASE for Windows Language Reference manual, Appendix C.

DISCLAIMER: You have the right to use this technical information subject to the terms of the No-Nonsense License Statement that you received with the Borland product to which this information pertains.

資料7 打ち合わせ議事録

打ち合わせ議事録

題名:汎用地理情報システムへの MIF 変換コンバーター作成

日時:1996 年 1 月 11 日

場所:動燃事業団東濃地科学センター応接室

出席者:(敬称略)

動燃事業団鉱床解析室	高橋、小堀
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科学・環境システム部	馬場

議題

- 1.MIF コンバータ稼働環境の確認。
- 2.MIF データ項目の現状の確認。
- 3.日本語の扱いに関する要望。
- 4.ArcPress の扱いに関する要望。
- 5.将来のカスタマイズ案件説明。

- 1.MIF コンバータ稼働環境の確認。

現行稼働環境を見学しディレクトリー構造の資料をいただいた。

・GIASURA の現行稼働環境の説明を動燃事業団より受けた。

添付(現在の Workstation の環境)を参照

・ディレクトリー構造の資料をいただいた。

- 2.MIF データ項目の現状の確認。

・GIASURA の現行データフォーマット(Point,PoliLine,Poligon)の仕様の概略説明を受けた。

・サンプルデータおよび仕様書を借用した。

- 3.日本語の扱いに関する要望。

WSに繋げるプロッターで、ARC/INFO系GISから日本語データを出力する方法を調査してほしい。  
(高橋)

PC上で作成した日本語を含む coverage file を W/S 上の ARC/INFO 系 GIS に持って行って利用することになると思うが、GIS エンジンが 2 バイトコード化されているかどうか、日本語フォントをどのようにインプリメントするか、どのような利用方法になるか調べて回答することとした。(馬場)

- 4.ArcPress の扱いに関する要望。

ArcPress の利用も考えたい。ARC/INFO 系 GIS と連動できるか？(高橋)

あわせて調査し、回答することとした。(馬場)

5.将来のカスタマイズ案件説明。

CCS の提案するカスタマイズ案件は、以下のようなもの。

1.Backup/Restore

2.Loading(DXF,UKOOA,etc...)

3.Image Fitting

これらは動燃事業団殿のご要望にあわせて、カスタマイズとして扱わせてほしい。(馬場)

ARC/INFO 系 GIS を利用してみた上で、今後の案件として検討したい。(高橋)

以上

## 現在の Workstation の環境

Machine : HP 9000 Series 700 Model 755/125 CRX

OS : HP-UX A.09.05 A (2 ユーザライセンス)

Motif : Version 1.2 , X11R5

Window Manager : HP VUE 3.0

Memory : 123MB

Disk Space : 419MB ('95.11.30 現在)

Swap Space : 204MB

Media : CD-ROMドライブ、5.25インチMOドライブ、FDドライブ、カートリッジテープドライブ、DDSテープドライブ

## DATABASE 環境

Machine : HP 9000 Series 800 Model G70 Server

Product : ORACLE ( Kernel : RDBMS 7.1.3、Network : SQL-Net 2.1.3.0 )

## ViewPoint 導入の際に必要なハードウェア環境

ViewPoint は Disk Space を最低でも 600MB 使用するのので、現在の Disk Space を考えるとハードディスクを増設する必要がある。( 4GB 程度を考えている。)

## マシン上の主要アプリケーション

### G 7 0 に搭載

名 称	ホームディレクトリ	使用ブロック数 (512バイトブロック)	使用バイト数 (MB)
O2	/users/o2	203,624	104
Oracle	/users/oracle	1,074,052	550
XRT	/usr/xrt	26,766	14
Sequelink	/users/sequelink	7,644	4
SDB	/users/scdb	279,170	143
		計	815

'95.12.10 現在のハードディスク使用可能容量 293 MB

### 7 5 5 / 1 2 5 に搭載

名 称	ホームディレクトリ	使用ブロック数 (512バイトブロック)	使用バイト数 (MB)
LYNX	/users/lynx	418,864	214
GLASURA	/app/giasura	1,332,200	682
		計	896

'95.12.10 現在のハードディスク使用可能容量 416 MB

打ち合わせ議事録

題名:汎用地理情報システムへの MIF 変換コンバーター作成

日時:1996年2月21日

場所:動燃事業団東濃地科学センター第一会議室

出席者:(敬称略)

動燃事業団鉱床解析室 高橋、小堀  
CCS 科学・環境システム部 馬場、山本

議題

- 1.報告書スタイルの確認。
- 2.日本語の扱いに関する説明。
- 3.MIF コンバータ基本構想説明
- 4.MIF データ内容に関する質疑応答

- 1.報告書スタイルの確認。

CCS より報告書の草稿を提示し、確認を行った。

- ・報告書の様式の説明を動燃事業団より受けた。
- ・各項目の説明を行った。
- ・参考文献一覧を添付する事になった。(様式は自由)一般の様式で記述する。
- ・解説として、coverage,空間解析を加えたい。(馬場)

- 2.日本語の扱いに関する説明

WS に繋がっているプロッターで、ArcView 日本語版のデータを出力するためには、WS 上に日本語フォントが必要であることを説明した。入力に関して PC ArcView の導入が必要である。

- 3.MIF コンバータ基本構想説明

- ・今回の MIF コンバーターの位置付けを図化して説明した。(馬場)
- ・WS 上で作成した Coverage File を今後 PC,Mac に持って行って利用するが、Mac 版では、e00 しかサポートされていないのでは? PC のみならず Mac に関しても調査願いたい(高橋)

---- Mac 版での状況を調査する。

- ・基本的なデータの渡し方は、3通り。以下に説明 (馬場)

- (1)ネットワーク接続で、マウントして読む場合
- (2)ネットワーク接続しない Coverage File を読む場合
- (3)媒体を通じて読み込む場合

最初の2ケースの方法をお薦めする。(馬場)

e00 (Export file) を読むのが基本。(これは、Mac、Windows と同じ)

ネットワーク接続で、読む場合。(ARC/INFO V7以降)

UNIXのカバレッジをマウントして、ARC/VIEWで読み込む。

マウントするソフトは別途必要。

ARC/VIEWが、UNIX,DOS間のファイル形式の違いを吸収する。

ネットワーク接続でないカバレッジファイルを読む。

UNIX版とPC ARC/INFOでは、カバレッジの構造が異なり、

プログラミングする等の工夫してからでないと読めない。

・いずれにしても Coverage File を将来 Mac 版・PC 版で取り扱う場合、Mac 版・PC 版とも、同じファイルフォーマットを利用した方がよいでしょうね。(馬場)

・プロッターは次年度導入予定である。出力図は大容量が予想され、ArcPress が必要と考えられる。ArcPress は、図のどこに位置するのか?(高橋)

--- 今回のシステムには、直接関係ないが、将来の利用を考え ArcPress の入る位置を図上で説明した。(馬場)

・空間解析を今後物探データも含めて行う必要があるかと考えている。その一歩として ArcView フォーマットに幾つかのグラフィックフォーマットからの変換を現在、動燃事業団が計画している。変換内容を以下に説明(高橋)

Mac 上で、 MIF → Shape

[リモセン] PICT → Shape

[物探] Geopac vector → Shape

・空間解析の一つとしてリモセンのデータを取り込んで GIS で利用したい。今回の ViewPoint と Crescent との関係について聴きたい(高橋)

・Crescent の BIL,BSQ 等のファイルはそのまま Arc/Info に出せる。但し、座標を合わせる機能は持ち合わせていない。(馬場)

・Crescent には、モザイク機能が付いていて、二つの絵を重ねあわせる事が出来る。Crescent の標準機能である。(馬場)

・将来構想として、デジタイザや GPS のデータまた他の GIS データ(DXF,CAD 系ファイル)を ViewPoint(ArcView)に取り込んで処理したい。更に Image Fitting も実施したい。(高橋)

・CCS がかつて提案したカスタマイズ案件は、以下のようなものであった。(馬場)

1.Backup/Restore

2.Loading(DXF,UKOOA,etc...)

3.Image Fitting

これらを、現在の要望とあわせて、整理して今後の計画として扱いたい。(高橋)

・MIF ファイルに現在入力しているデータに関する質疑。

1.Point

### 1-1. 鉱床・鉱徴

1-1-Att. X,Y,名前,Type,鉱量,深度,Dimension  
(header は、鉱量が reserve。他は、数値 or Text)

### 1-2. 露頭の MIF File

1-2-Att. 位置名,図幅名,日付,氏名,岩石名,放射能値,分析値(走向・傾斜)

## 2. PolyLine

### 2-1. 断層

### 2-2. リニアメント

### 2-3. 道路(主,副,側線)

### 2-4. 岩相境界線

### 2-5. 写真・リモセンの境界線

2-x.att. id と X,Y

## 3. Polygon

### 3-1. Geological Name(大分類)

### 3-2. Geological Name(中分類)

### 3-3. Geological Name(小分類)

### 3-4. Rock Name

### 3-5. Ages

・ ViewPoint でバッファリング処理で Polygon 表示は出来るのか。昨年、東野さんにやっ  
てもらったデモでは、この機能を見た。(高橋)

・ 調査して回答する。(デモでは、バッファリング処理ができることは説明したが、Polygon  
表示を行なったかどうか?ただ、ARC/INFO は、コマンドレベルで、このような図形を生  
成できるのに対して ArcView2.1 では基本機能で図形を生成することはできない。そのため  
には、VERTEX (X,Y の点列の組み) を生成するのに、開発言語 AVENUE を使用すること  
になる。なお、ArcView3.0 ではこの機能はサポートされる予定)

以上