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An Abbreviation Key for the DASCH System:

A Lithostratigraphic Information Storage and Retrieval System

by

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The DASCH System

DASCH[1]/ is a computer-based information storage and retrieval system which accepts lithostratigraphic information and produces both graphic and tabular compilations. This system has been modified for use on the U.S.G.S. MULTICS computer.

The primary strength of the DASCH system is its capability to store for immediate recall large quantities of stratigraphic information. The information stored in the system can be manipulated by means of logically structured questions which compare and contrast specific details of stratigraphic units. This operation produces a listing of stratigraphic units which satisfies the questions posed by the investigator along with a map showing the location of these observations. Intermediate products of this kind are aids in planning field work and in facilitating initial map compilation.

Further processing of the initial output produces line drawings of stratigraphic sections which can be used to make local or regional scale cross-sections. A final processing step plots in plan view the location and arrangement of similar vertical sequences. This map plot can be used by the geologist in conjunction with isopach maps to make a sequence map representing the geometry of the rock bodies under investigation.

1/ Ein Dokumentations-und Abfrogeprogamm fur schichtenverzeichnisse (DASCH): Geologisches Jahrbuch, A7, p. 25-33, 1973.

The abbreviations in this document were designed primarily for use in sedimentary terranes. The present system design was influenced by its initial use in the Coastal Plain of Georgia and Alabama. Abbreviations for crystalline rocks have been omitted from this key but may be added in the future.

Input Procedure

This key presents the format and abbreviations necessary to enter field and laboratory observations into the DASCH system for processing. Using these abbreviations, observations are recorded on a formatted field sheet, (figure 1a),which when completed is keypunched. The punched cards are used to produce a listing which is edited and verified. When the cards have been corrected, they are stored on magnetic disk for processing.

A borehole or section record consists of title card and the data cards with the description of the strata. The following information is contained in the title card:

Borehole number

Map sheet name

State

County

Location coordinates

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110UNION          GASTEW32.200084.9615     65.53 POO
```

COMPILER	YEAR	MONTH	DAY	DATA SOURCE
ARTIN	97	70	32	01 FIELD SECTION

```
PTH /LITHOLOGY/MINERALOGY;COLOR/FOSSILS/STRATIGRAPHY/REMARKS $
1.4/SC(MASS)FS(CEM,CCN)/QTZ,GLA;/EXOGYRA,BIV(SL,MO)LAB BIO
   (NANO)/BLF(CRET)/$
1.9/VFS(MB,LAM,SORT5)/QTZ,GLA,MUS(HMN);WH/BUR2,BIV(SL)/BLF
   (CRET)/DISTINCT TRACEABLE BED:PHOTOS$
2.3/CS(MOT,MASS,CCN)/QTZ,MUS;/BIV(SL)/BLF(CRET)/$
```

1a

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 011OUNION        2.3/CS(MOT.MASS.CCN)/QTZ.MUS:/BIV(SL)/BLF(CRET)/$
 011OUNION      DISTINCT TRACEABLE BED:PHOTOSS
 011OUNION        1.9/VFS(MB.LAM.SORT5)/QTZ,GLA,MUS(HMN);WH/BUR2,BIV(SL)/BLF(CRET)/
 011OUNION    BLF(CRET)/$
 011OUNION-       1.4/SC(MASS)FS(CEM.CCN)/QTZ.GLA;/EXOGYRA,BIV(SL,MO)LAB BIO(NANO)/
 011OUNION      GASTEW32.200084.9615     65.53 POORMARTIN      97703201 FIELD SECTION
```

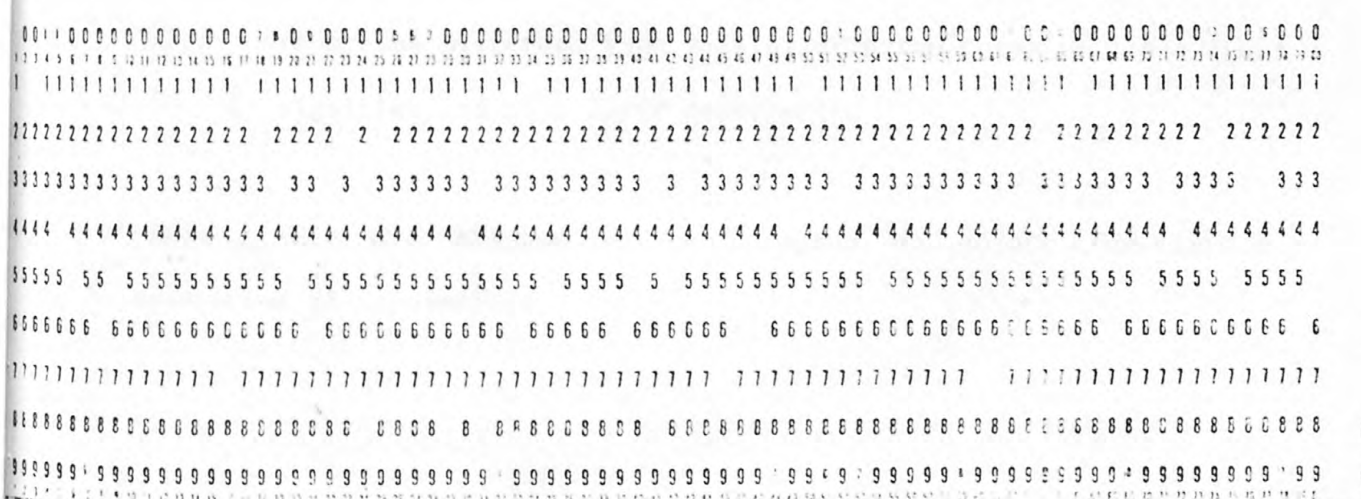

1b

Figure 1 Example of input to DASCH system

The DASCH input sheet in figure 1a contains descriptive information for measured field section number 110 covering the interval from surface elevation (65.5m) to 2.3m. The same information is shown on the punch cards in figure 1b.

Elevation and reliability

Compiler

Date

Data source

The data cards with the layer descriptions are free format with punctuation marks to separate fields of information. The data card format is as follows:

Depth/Lithology/Mineralogy;Color/Fossils/Stratigraphy/Remarks$

Each of these fields is explained in detail in the following pages.

Logical Operators

The punctuation marks used in the DASCH system have the following meanings:

/	separates the main descriptive fields within a layer
;	separates mineralogy and color fields
( ),:-	separates modifiers from main descriptive terms within a field
$	signifies end of a layer description

Empty spaces are skipped by the program and do not constitute a separation of information.

Title Card

The title card records the identification information about the borehole or outcrop described. All of the entries on the title card have a fixed length and position on the card.

Card column	
1 - 4	Borehole number or observation number assigned by compiler
5 - 11	Name of the map sheet on which the observation is located Any abbreviation may be used.
12	Optional field.
13 - 15	Blank.
16 - 17	2 letter standard state abbreviation.
18 - 21	4 letter county code provided by compiler.
22 - 35	X and Y coordinates of observation.
36 - 42	Elevation in meters of top of borehole or outcrop.
43	Number code for reliability of elevation. 1 Unknown or uncertain: 2 $\pm$ 10 meters: 3 $\pm$ 3 meters: 4 $\pm$ 1 meter.
44 - 48	Source of elevation determination (conversion to meters): archival source (1) interpolation from topo sheet 1:250,000 (2) interpolation from topo sheet 1:24,000 (3)

	altimeter reading (type) (4)
49 - 58	Name of compiler of description.
59 - 61	Last three digits of year of observation.
62 - 63	Month of observation.
64 - 65	Day of observation.
66	Number code for data source,
	1 through 7 (see below).
67 - 80	Data source (abbreviated):
	field section (1)
	field well log (2)
	auger hole (3)
	log from core material (4)
	archive measured section (5)
	archive well log (6)
	geophysical log (7)

Depth / / ; / / / $

The layer descriptions for boreholes and outcrops are recorded from the top down. The depths may be written as whole numbers and decimal meters. Examples: Borehole or section description recorded as depths below the top of the well or outcrop:

10.4/

15.1/

26.8/

The description recorded for the 10.4m depth includes the interval from 0 to 10.4m, and is listed this way in all print-outs.

/ Lithology / ; / / / $

Descriptive information in this field is limited to textural and gross compositional characteristics of the stratigraphic unit. Additional abbreviations which may be useful in this field are more commonly placed in the mineralogy or fossil fields. Although duplication is generally avoided some of the most common abbreviations appear in more than one field.

The abbreviations under lithology concentrate on textural and compositional terms. Terms which have strong genetic implications such as loess or till have generally been avoided. The grain size terminology corresponds to terms as defined by Wentworth (1922) and is roughly comparable to Leighton and Pendexter (1962). Separate symbols for coarse through very fine silt have not been presented since these are not typical field observations. The textural terms for limestone are from Dunham (1962). The sandstone terminology is from Dott(1964). Semiquantative estimates of percent content can be placed after any abbreviation on a scale of 1 to 5 (see examples at end of section). The terms sparse (SP) and abundant (AB) may be used for archival sources.

Unconsolidated Sediments

C	Clay
SI	Silt
S	Sand
VFS	Very fine sand

FS	Fine sand
MS	Medium sand
GS	Coarse sand
GR	Gravel
GN	Granule
PB	Pebble
CO	Cobble
BO	Boulder
OZ	Ooze
DIA	Diatomite
LM	Lime mud
CAS	Carbonate sand
PEL	Peloids or pellets
OO	Oolite
PIS	Pisolites
ALU	Alluvium
BON	Bone
COL	Colluvium
CRB	Carbonaceous
GRS	Greensand
PHS	Phosphatic sand
PT	Peat
RES	Residuum
SK	Skeletal fragments
SL	Shell

TTH	Teeth

Indurated Sediments and Sedimentary Rocks

ART	Arenite
ASH	Ash
BHR	Buhrstone
BR	Breccia
CCN	Concretion
CEM	Cement
CG	Conglomerate
CHE	Caliche
CHT	Chert
CK	Chalk
COQ	Coquina
CST	Claystone
DOL	Dolomite
GRT	Grainstone
GWK	Graywacke
LST	Limestone
MCR	Micrite
MDT	Mudstone
ML	Marl
NDL	Nodule
PKT	Packstone
SH	Shale
SIT	Siltstone

ST	Sandstone
STN	Septarian
TRV	Travertine
WKT	Wackestone
XLLS	Crystalline limestone

Bedding Features and Modifiers

AD	At depth
BLKY	Blocky
BUR	Burrow
CH	Channel
CL	Clast
CP	Chips
CONV	Convolute bedding
CREST	Crystal casts
DEN	Dense
FEST	Ironstone/iron stain
FIS	Fissile
FOL	Foliation
FRAC	Fractured
FRG	Fragments
FRI	Friable
GRAD	Graded
HKY	Hackly
HBED	Horizontally bedded
HLAM	Horizontally laminated

IBED	Interbedded
ILAM	Interlaminated
IMB	Imbricated pebbles or other framework elements
INC	Inclusion
IND	Indurated
INJ	Injection
IRB	Irregularly bedded
ITON	Intertongue
LAM	Laminated
LD	Load structures
LEI	Leisegangsbande
LEN	Lens
MASS	Massive
MCK	Mud cracks
MOT	Mottles
MX	Matrix
PD	Pod
SAC	Saccharoidal
SLIK	Slickensides
SLP	Slump structures
SPL	Splintery
TERR	Terrace
V	Very
XBED	Crossbedded
XLAM	Cross laminated

POR	Porosity	POR(1 - 5)
WROU	Well rounded	ROU 5
ROU	Rounded	ROU 4
SROU	Sub rounded	ROU 3
SANG	Sub angular	ROU 2
ANG	Angular	ROU 1
PSORT	Poorly sorted	SORT 1
WSORT	Well sorted	SORT 5
OPAK	Open packing	
CPAK	Close packing	

TIL	Thinly laminated	0 - 0.3cm
THL	Thickly laminated	0.3 - 1.0cm
VTIB	Very thinly bedded	1.0 - 3.0cm
TIB	Thinly bedded	3.0 - 10.0cm
MB	Medium bedded	10.0 - 30.0cm
THB	Thickly bedded	30.0 - 100.0cm
VTHB	Very thickly bedded	> 100.0cm

(For archival sources, the above do not always imply a thickness.)

Examples:

/G, FS: CMX/ = gravel and fine sand with a clay matrix.

/G, FS, CMX/ = gravel in a clayey fine sand matrix.

/G: FS - CMX/ = gravel with a matrix ranging from fine sand to clay.

/G - FS, CMX/ = interval ranges from gravel to fine sand with clayey matrix.

/FS 3, G2, CMX/ = interval consists of 60% fine sand, 40% gravel framework in a clay matrix.

/G - GS: IBED (MS,C: LAM)/ = gravel to coarse sand interbedded with laminated clayey medium sand.

/GRS, C: ITON (QTZS:XLAM,CRB)/ = greensand with clay matrix intertonguing with crosslaminated quartz sand containing carbonaceous debris.

/ / Mineralogy ; / / / $

Minerals should be listed in decreasing order of abundance. This field is intended mainly for field observations, however, petrographic or x-ray work on the sand or clay fractions may also be stored. Space may be reserved for this purpose by adding the notation LAB C for clay mineralogy and/or LAB S for sand fraction petrogarphy. Abbreviations ideally will be restricted to 3 letters in this field.

AMP	amphibole
ARG	aragonite
BAX	bauxite
BOT	biotite
CAL	calcite
CHL	chlorite
CHT	chert
DOL	dolomite
FEL	feldspar
GAR	garnet
GLA	glauconite
GYP	gypsum
HAL	halite
HNB	hornblende
HMN	heavy minerals
HEM	hematite
ILL	illmenite
KAO	kaolin
LIM	limonite

MAG	magnetite
MAN	manganese mineralization
MIC	mica
MUS	muscovite
PHS	phosphate
PYR	pyrite
PYX	pyroxene
QTZ	quartz
SID	siderite
TOU	tourmaline
ZIR	zircon

Examples:

/ / QTZ 4, FEL 1 (AMP,ZIR,MUS); = Rock contains 80% quartz, 20% feldspar and trace amounts of amphibole, zircon, and muscovite.

/ / GLA,QTZ (HMN); = Rock contains more glauconite than quartz and accessory amounts of heavy minerals.

/ / ; Color / / / $

The following abbreviations are suggested for color description of rock units. Rather than requiring or even suggesting that Munsell or some other standard color chart be used, we suggest abbreviations which may be more understandable in a print-out. Standard color chart terminology is not specifically excluded from use in this information field. This is intended as a field aid in indicating the condition of a rock unit - wet or dry, fresh or weathered - as well as a qualitative color describing the stratigraphic unit.

Colors - Primary and Secondary

RD	Red
OR	Orange
YE	Yellow
GR	Green
OL	Olive
BL	Blue
VI	Violet
BR	Brown
TA	Tan
BF	Buff

BK	Black
GY	Gray
WH	White

Modifiers

L	Light
M	Medium
D	Dark
OPQ	Opaque
WT	Wet
DY	Dry
FR	Fresh
AD	At depth
WD	Weathered

Examples:

1) / / ; BF - BR,L(DY,WD) / = Unit ranges in color from buff to light brown when dry and weathered.

2) / / ; GY,BL,D(WT,FR) / = Unit is dark gray and blue when wet and fresh.

3) / / ; GYBL,L / = Unit is light bluish gray.

/ / ; / Fossils / / $

This field is intended as a general listing of macroscopic trace and/or body fossils. Additional biostratigraphic work may be noted as (LAB BIOL) at the end of the field. Genetic names or their abbreviations may be entered rather than the group abbreviations presented below.

Body Fossils

FOR	Foraminifera
SPN	Sponges
COR	Corals
STP	Stromatoporoids
BRY	Bryzoans
BRA	Brachiopods
WMT	Worm tubes
MOL	Mollusks
BIV	Bivalves
GAS	Gastropods
CEP	Cephalopods
COQ	Coquina
ART	Arthropods
INS	Insects
CRA	Crabs
OST	Ostracods
ECI	Echinoderm

BON	Bone
TTH	Teeth
VER	Vertebrae
FIS	Fish scales
WOD	Wood
LEV	Leaves
CON	Cones
GRS	Grass

ALG	Algae
SRM	Stromatolites
CALG	Coralline algae
GALG	Green algae
CSP	Calcispheres
CRB	Carbonaceous remains
FOS	Fossiliferous

Trace fossils

BUR	Burrows
MOT	Mottled texture, bioturbated
BOR	Borings
TRA	Tracks
ROO	Rooting

Artifacts

POT	Pottery

ART	Artifacts

Modifiers

MO	Mold
CST	Cast
SL	Shell
FRG	Fragments
SPI	Spines
SPC	Spicules

Examples:

1) / /; / BIV (SL),BRY (MO),WMT (LAB BIOL)/ / $ = Interval contains bivalve shell material, bryozoan molds, worm tubes - samples taken for further analysis.

2) / / ; /WOD 5, BIV 1 (MO,CST) / / $ = Interval contains very abundant wood fragments, sparse bivalve molds and casts.

3) / / ; / BUR 3,OPHIO, BOR? / / $ = Interval contains moderately abundant burrows including Ophiomorpha and possible borings.

/ / ; / / Stratigraphy / $

Information stored in this field consists of lithostratigraphic terminology, i.e. formation and/or member designations, and geologic period. The abbreviations given below do not include stage names because in most cases formational terminology plus either European or provincial stage names would tend to be redundant. Further, this might not be information readily available in the field. Geologic periods may be modified by U, M, and L (Upper, Middle, and Lower) preceding the abbreviation for the geologic period.

Compound formational names may be abbreviated to 3 or 4 letters rather than 3 as for the example cited.

Geologic Periods

PCAM	Precambrian
PALZ	Paleozoic
CAMB	Cambrian
ORDO	Ordovician
SILU	Silurian
DEVO	Devonian
MISS	Mississippian
PENN	Pennsylvanian
PERM	Permian
MESO	Mesozoic
JURA	Jurassic

TRIA	Triassic
CRET	Cretaceous
TERT	Tertiary
PALC	Paleocene
EOCE	Eocene
OLIG	Oligocene
PLIO	Pliocene
QUAT	Quaternary
PLEI	Pleistocene
HOLO	Holocene
RECE	Recent

U	Upper
M	Middle
L	Lower
UNDIF	Undifferentiated

Formations

TUS	Tuscaloosa
EUT	Eutaw
BLF	Blufftown
CUS	Cusseta
RIP	Ripley
PRO	Providence
CLA	Clayton
NAN	Nanafalia

GCRK	Gravel Creek
GHILL	Grampian Hills
TCH	Tuscahoma
HAT	Hatchetigbee
BAS	Bashi
CLB	Claibourne undifferentiated
TAL	Talahatta
LIS	Lisbon
MBE	McBean
CLI	Clinchfield
MBRH	Moodys Branch
OCA	Ocala
FRIV	Flint River
TWI	Twiggs
IRW	Irwinton
COO	Cooper
SAN	Sandersville
SUW	Suwannee
HAW	Hawthorn
MIC	Miccosukee
CHR	Charlion
DUP	Duplin
Bar	Barnwell

Groups

CLB	Claibourne

WIL	Wilcox
JKS	Jackson
MID	Midway

Quaternary Units

ALU	Alluvium
RES	Residium
COL	Colluvium
SOL	Soil horizon
LAK	Lake beds

Examples:

1) / / ; / / RIP (UCRET)/ = Ripley Formation (Upper Cretaceous)

2) / / ; / / NAN,GCRK (PALC) / = Nanafalia Formation, Gravel Creek Member (Paleocene)

/ / ; / / / Remarks$

The remarks field is designed to be used for non-abbreviated text information that does not conveniently fit in the other fields. Sampling details, additional site description, and archival references are examples of information that may be recorded. This field, like the other six, is optional and may be omitted by placing the $ sign. The $ sign is the symbol that separates the information recorded for each layer, and it must appear at the end of every layer description. The following abbreviations are suggested for commonly used terms.

AB	Abundant
AD	At depth
APRX	Approximate
CONSOL	Consolidated
DISSEM	Disseminated
DOM	Dominate
GRN	Grains
IRREG	Irregular
MICOUS	Micaceous
PMAG	Paleomagnetic
RX	Rocks
SIL	Silicified
UNCONSOL	Unconsolidated
VAR	Variety
XLLINE	Crystalline
XL	Crystal

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