The following document is patterned after (and much of it is copied directly from):

Technical Report C90-01
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Center for Seismic Studies
Version 3 Database:
Schema Reference Manual

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The present document, however, is derived directly from a schema file used by Antelope's software. Both this document and the schema differ somewhat from the original Technical Report from CSS.

This document differs in the following ways:

- Tables and attributes not used in the data set have been deleted.
- References to the ORACLE database representation are removed.

The schema may be entirely different. If it's related to the origin CSS 3.0 schema, the changes may be documented in the Schema statement.

1.0 INTRODUCTION

This volume describes a Datascope schema.

DATABASE STRUCTURE

This chapter defines the physical structure of each table, in its flat file representation. The name of the relation appears in **bold** print at the top. Exactly one blank separates fields in these files, and one linefeed separates records. This improves readability and makes it easier for C programs to scan the records.

Each field has a an associated "type", recognized by the library routines. These basic data types, and their corresponding representation in C and FORTRAN library interfaces are shown below:

type	C	FORTRAN
string	char *	character *(*)
time	double	real *8
real	double	real *8
integer	int	integer
yearday	int	integer
date	char *	character *(*)

Fields of type *time* are represented as epoch times -- seconds since January 1, 1970. *Yearday* fields are of the form YYYYDDD. Eg, 1988080 represents day 80 of the year 1988, or February 29, 1988. *Date* fields are typically written as MM/DD/YYYY, but this format is not required. A library of routines which simplifies the conversions among these various representations of time is provided; see epoch(3) and epoch(3f).

All floating point values are represented in double precision by the db library.

The "print format" of each field is given in C printf style. All numeric entries are right justified and all character strings are left justified. Having the field number quickly accessible is useful when writing *awk* and shell scripts.

Relation:		**achanaux**			
Description:		map foreign chan+aux code to local chan code			
field name	no.	type	print format	character positions	attribute description
sta	1	string	%-6s	1-6	station
fchan	2	string	%-8s	8-15	foreign channel
aux	3	string	%-8s	17-24	autoDRM auxiliary code
chan	4	string	%-8s	26-33	channel
lddate	5	time	%17.5f	35-51	(epoch) time of last record modification

Relation:		**affiliation**			
Description:		Network station affiliations			
field name	no.	type	print format	character positions	attribute description
net	1	string	%-8s	1-8	unique network identifier
sta	2	string	%-6s	10-15	station
lddate	3	time	%17.5f	17-33	(epoch) time of last record modification

Relation:		**anetsta**			
Description:		map autodrm net+sta code to local sta code			
field name	no.	type	print format	character positions	attribute description
anet	1	string	%-9s	1-9	SEED network code
fsta	2	string	%-6s	11-16	foreign station code
sta	3	string	%-6s	18-23	station
lddate	4	time	%17.5f	25-41	(epoch) time of last record modification

Relation:		**arrival**			
Description:		Summary information on a seismic arrival			
field name	no.	type	print format	character positions	attribute description
sta	1	string	%-6s	1-6	station
time	2	time	%17.5f	8-24	epoch time
arid	3	integer	%8d	26-33	arrival id
jdate	4	yearday	%8d	35-42	julian date
stassid	5	integer	%8d	44-51	stassoc id
chanid	6	integer	%8d	53-60	channel operation id
chan	7	string	%-8s	62-69	channel
iphase	8	string	%-8s	71-78	reported phase
stype	9	string	%-1s	80-80	signal type
deltim	10	real	%6.3f	82-87	delta time
azimuth	11	real	%7.2f	89-95	observed azimuth
delaz	12	real	%7.2f	97-103	delta azimuth
slow	13	real	%7.2f	105-111	observed slowness (s/deg)
delslo	14	real	%7.2f	113-119	delta slowness
ema	15	real	%7.2f	121-127	emergence angle
rect	16	real	%7.3f	129-135	rectilinearity
amp	17	real	%10.1f	137-146	amplitude, instrument corrected, nm
per	18	real	%7.2f	148-154	period
logat	19	real	%7.2f	156-162	log(amp/per)
clip	20	string	%-1s	164-164	clipped flag
fm	21	string	%-2s	166-167	first motion
snr	22	real	%10.5g	169-178	signal to noise ratio
qual	23	string	%-1s	180-180	signal onset quality
auth	24	string	%-15s	182-196	source/originator
commid	25	integer	%8d	198-205	comment id
lddate	26	time	%17.5f	207-223	(epoch) time of last record modification

Relation:		**assoc**			
Description:		Data associating arrivals with origins			
field name	no.	type	print format	character positions	attribute description
arid	1	integer	%8d	1-8	arrival id
orid	2	integer	%8d	10-17	origin id
sta	3	string	%-6s	19-24	station
phase	4	string	%-8s	26-33	associated phase
belief	5	real	%4.2f	35-38	phase confidence
delta	6	real	%8.3f	40-47	station to event distance
seaz	7	real	%7.2f	49-55	station to event azimuth
esaz	8	real	%7.2f	57-63	event to station azimuth
timeres	9	real	%8.3f	65-72	time residual
timedef	10	string	%-1s	74-74	time = defining, non-defining
azres	11	real	%7.1f	76-82	azimuth residual
azdef	12	string	%-1s	84-84	azimuth = defining, non-defining
slores	13	real	%7.2f	86-92	slowness residual
slodef	14	string	%-1s	94-94	slowness = defining, non-defining
emares	15	real	%7.1f	96-102	incidence angle residual
wgt	16	real	%6.3f	104-109	location weight
vmodel	17	string	%-15s	111-125	velocity model
commid	18	integer	%8d	127-134	comment id
lddate	19	time	%17.5f	136-152	(epoch) time of last record modification

Relation:		**beam**			
Description:		beam description parameters			
field name	no.	type	print format	character positions	attribute description
wfid	1	integer	%8d	1-8	waveform id
azimuth	2	real	%7.2f	10-16	observed azimuth
slo	3	real	%7.4f	18-24	slowness (s/km)
filter	4	string	%-30s	26-55	filter description
recipe	5	string	%-15s	57-71	recipe name
algorithm	6	string	%-15s	73-87	processing algorithm used
auth	7	string	%-15s	89-103	source/originator
lddate	8	time	%17.5f	105-121	(epoch) time of last record modification

Relation:		**calibration**			
Description:		Station-Channel calibration parameters			
field name	no.	type	print format	character positions	attribute description
sta	1	string	%-6s	1-6	station
chan	2	string	%-8s	8-15	channel
time	3	time	%17.5f	17-33	epoch time
endtime	4	time	%17.5f	35-51	last valid time for data
insname	5	string	%-50s	53-102	instrument name
snname	6	string	%s	104-135	dbbuild sensor selection name
dlname	7	string	%s	137-168	dbbuild datalogger selection name
samprate	8	real	%11.7f	170-180	sampling rate in samples/sec
segtype	9	string	%-1s	182-182	detector measurement type / natural units
dlsta	10	string	%s	184-199	datalogger station id
dlchan	11	string	%s	201-216	datalogger channel id
lead	12	string	%s	218-221	datalogger lead identifier
stream	13	integer	%8d	223-230	stream number
calib	14	real	%16.9g	232-247	nominal calibration
calper	15	real	%16.6f	249-264	nominal calibration period
fc	16	real	%11.6f	266-276	center frequency
units	17	string	%-12s	278-289	units of calib (e.g. nm, nm/sec, ...)
lddate	18	time	%17.5f	291-307	(epoch) time of last record modification

Relation:		**centryd**			
Description:		Information on the centroid location			
field name	no.	type	print format	character positions	attribute description
orid	1	integer	%8d	1-8	origin id
jdate	2	yearday	%8d	10-17	julian date
timecentryd	3	time	%15.3f	19-33	epoch time of first sample in file
lat	4	real	%9.4f	35-43	estimated latitude
lon	5	real	%9.4f	45-53	estimated longitude
depth	6	real	%9.4f	55-63	estimated depth
coterr	7	real	%5.1f	65-69	Standard error in origin time
claerr	8	real	%5.1f	71-75	Standard error in latitude
cloerr	9	real	%5.1f	77-81	Standard error in longitude
cdperr	10	real	%5.1f	83-87	Standard error in depth
durat	11	real	%5.1f	89-93	Source half-duration
nslpb	12	integer	%3d	95-97	Number of stations providing LP body waves
nrlpb	13	integer	%3d	99-101	Number of records providing LP body waves
tmnlpb	14	real	%5.1f	103-107	Cut-off period for mantle waves
nsmw	15	integer	%3d	109-111	Number of Staions Supplying Mantle Wave Records
nrmw	16	integer	%3d	113-115	Number of records providing mantle waves
tmnmw	17	real	%5.1f	117-121	Minimum Period Used in Body-Wave Inversion
dused	18	string	%-10s	123-132	name
auth	19	string	%-15s	134-148	source/originator
commid	20	integer	%8d	150-157	comment id
lddate	21	time	%17.5f	159-175	(epoch) time of last record modification

Relation:	**emodel**				
Description:	Velocity model error bound estimates table				
field name	no.	type	print format	character positions	attribute description
orid	1	integer	%8d	1-8	origin id
emodelx	2	real	%15.6lg	10-24	Location error bound in x (EW) due to model errors
emodely	3	real	%15.6lg	26-40	Location error bound in y (NS) due to model errors
emodelz	4	real	%15.6lg	42-56	Location error bound in depth due to model errors
emodelt	5	real	%15.6lg	58-72	Location error bound in origin timedue to model errors
lddate	6	time	%17.5f	74-90	(epoch) time of last record modification

Relation:	**event**				
Description:	Event identification				
field name	no.	type	print format	character positions	attribute description
evid	1	integer	%8d	1-8	event id
evname	2	string	%-15s	10-24	event name
prefor	3	integer	%8d	26-33	preferred origin
auth	4	string	%-15s	35-49	source/originator
commid	5	integer	%8d	51-58	comment id
lddate	6	time	%17.5f	60-76	(epoch) time of last record modification

Relation:	**fkgrid**				
Description:	F-K grid parameters				
field name	no.	type	print format	character positions	attribute description
sta	1	string	%-6s	1-6	station
refsta	2	string	%-6s	8-13	reference station for array members
chan	3	string	%-8s	15-22	channel
time	4	time	%17.5f	24-40	epoch time
endtime	5	time	%17.5f	42-58	last valid time for data
twin	6	real	%9.2f	60-68	time window (s)
filter	7	string	%-30s	70-99	filter description
dtime	8	real	%9.2f	101-109	time step (s)
nt	9	integer	%8d	111-118	number of time values
azimuth	10	real	%7.2f	120-126	observed azimuth
slo	11	real	%7.4f	128-134	slowness (s/km)
slowd	12	real	%7.4f	136-142	observed slowness width (s/km)
ppower	13	real	%7.4f	144-150	observed normalized peak power
semin	14	real	%7.4f	152-158	minimum east-west slowness (s/km)
semax	15	real	%7.4f	160-166	maximum east-west slowness (s/km)
ne	16	integer	%8d	168-175	number of east-west values
snmin	17	real	%7.4f	177-183	minimum north-south slowness (s/km)
snmax	18	real	%7.4f	185-191	maximum north-south slowness (s/km)
nn	19	integer	%8d	193-200	number of north-south values
datatype	20	string	%-2s	202-203	numeric storage
dir	21	string	%-64s	205-268	directory
dfile	22	string	%-32s	270-301	data file
foff	23	integer	%10d	303-312	byte offset
lddate	24	time	%17.5f	314-330	(epoch) time of last record modification

Relation:		**fplane**			
Description:		Focal mechanism definition			
field name	no.	type	print format	character positions	attribute description
orid	1	integer	%8d	1-8	origin id
mechid	2	integer	%8d	10-17	mechanism id
str1	3	real	%5.1f	19-23	Strike of first nodal plane
dip1	4	real	%5.1f	25-29	Dip of first nodal plane
rake1	5	real	%6.1f	31-36	Rake of First Nodal Plane
str2	6	real	%5.1f	38-42	Strike of second nodal plane
dip2	7	real	%5.1f	44-48	Dip of second nodal plane
rake2	8	real	%6.1f	50-55	Rake of Second Nodal Plane
taxazm	9	real	%5.1f	57-61	Azimuth of P-axis vector
taxplg	10	real	%5.1f	63-67	Plunge of T-axis
paxazm	11	real	%5.1f	69-73	Azimuth of P-axis vector
paxplg	12	real	%5.1f	75-79	Plunge of P-axis vector
algorithm	13	string	%-15s	81-95	processing algorithm used
auth	14	string	%-15s	97-111	source/originator
lddate	15	time	%17.5f	113-129	(epoch) time of last record modification

Relation:		**gregion**			
Description:		Geographic region			
field name	no.	type	print format	character positions	attribute description
grn	1	integer	%8d	1-8	geographic region number
grname	2	string	%-40s	10-49	geographic region name
lddate	3	time	%17.5f	51-67	(epoch) time of last record modification

Relation:		**instrument**			
Description:		Generic (default) calibration information about a station			
field name	no.	type	print format	character positions	attribute description
inid	1	integer	%8d	1-8	instrument id
insname	2	string	%-50s	10-59	instrument name
instype	3	string	%-6s	61-66	instrument code
band	4	string	%-1s	68-68	frequency band
digital	5	string	%-1s	70-70	(d,a) analog
samprate	6	real	%11.7f	72-82	sampling rate in samples/sec
ncalib	7	real	%16.6f	84-99	nominal calibration
ncalper	8	real	%16.6f	101-116	nominal calibration period
dir	9	string	%-64s	118-181	directory
dfile	10	string	%-32s	183-214	data file
rsptype	11	string	%-6s	216-221	response type
lddate	12	time	%17.5f	223-239	(epoch) time of last record modification

Relation:		**lastid**			
Description:		Counter values (Last value used for keys)			
field name	no.	type	print format	character positions	attribute description
keyname	1	string	%-15s	1-15	id name (arid, orid, etc.)
keyvalue	2	integer	%8d	17-24	last value used for that id
lddate	3	time	%17.5f	26-42	(epoch) time of last record modification

Relation:		**moment**			
Description:		Describes the moment tensor for a given origin.			
field name	no.	type	print format	character positions	attribute description
orid	1	integer	%8d	1-8	origin id
mexpon	2	integer	%3d	10-12	Exponent of values below
mrr	3	real	%5.2f	14-18	components..
mtt	4	real	%5.2f	20-24	of..
mff	5	real	%5.2f	26-30	moment..
mrt	6	real	%5.2f	32-36	tensor.
mrf	7	real	%5.2f	38-42	..
mtf	8	real	%5.2f	44-48	..
mrrerr	9	real	%5.2f	50-54	Standard error in mrr
mtterr	10	real	%5.2f	56-60	Standard error in mtt
mfferr	11	real	%5.2f	62-66	Standard error in mff
mrterr	12	real	%5.2f	68-72	Standard error in mrt
mrferr	13	real	%5.2f	74-78	Standard error in mrf
mtferr	14	real	%5.2f	80-84	Standard error in mtf
taxval	15	real	%6.2f	86-91	Length of T-axis vector
taxplg	16	real	%5.1f	93-97	Plunge of T-axis
taxazm	17	real	%5.1f	99-103	Azimuth of P-axis vector
paxval	18	real	%5.2f	105-109	Length of P-axis vector
paxplg	19	real	%5.1f	111-115	Plunge of P-axis vector
paxazm	20	real	%5.1f	117-121	Azimuth of P-axis vector
naxval	21	real	%5.2f	123-127	Length of N(null)-axis vector
naxplg	22	real	%5.1f	129-133	Plunge of N-axis vector
naxazm	23	real	%5.1f	135-139	Azimuth of N-axis vector
bestdc	24	real	%5.2f	141-145	Moment of best-fitting double couple
str1	25	real	%5.1f	147-151	Strike of first nodal plane
dip1	26	real	%5.1f	153-157	Dip of first nodal plane
rake1	27	real	%6.1f	159-164	Rake of First Nodal Plane
str2	28	real	%5.1f	166-170	Strike of second nodal plane
dip2	29	real	%5.1f	172-176	Dip of second nodal plane
rake2	30	real	%6.1f	178-183	Rake of Second Nodal Plane
dused	31	string	%-10s	185-194	name
auth	32	string	%-15s	196-210	source/originator
commid	33	integer	%8d	212-219	comment id
lddate	34	time	%17.5f	221-237	(epoch) time of last record modification

Relation:	**netmag**			
Description:	Network magnitude			
field name	no.	type	print format	character positions	attribute description
magid	1	integer	%8d	1-8	magnitude id
net	2	string	%-8s	10-17	unique network identifier
orid	3	integer	%8d	19-26	origin id
evid	4	integer	%8d	28-35	event id
magtype	5	string	%-6s	37-42	magnitude type (ml, ms, mb, etc.)
nsta	6	integer	%8d	44-51	number of stations used
magnitude	7	real	%7.2f	53-59	magnitude
uncertainty	8	real	%7.2f	61-67	magnitude uncertainty
auth	9	string	%-15s	69-83	source/originator
commid	10	integer	%8d	85-92	comment id
lddate	11	time	%17.5f	94-110	(epoch) time of last record modification

Relation:	**network**			
Description:	Network description and identification			
field name	no.	type	print format	character positions	attribute description
net	1	string	%-8s	1-8	unique network identifier
netname	2	string	%-80s	10-89	network name
nettype	3	string	%-4s	91-94	network type, array, local, world-wide, etc.
auth	4	string	%-15s	96-110	source/originator
commid	5	integer	%8d	112-119	comment id
lddate	6	time	%17.5f	121-137	(epoch) time of last record modification

Relation:	**origerr**			
Description:	Summary of confidence bounds in origin estimations			
field name	no.	type	print format	character positions	attribute description
orid	1	integer	%8d	1-8	origin id
sxx	2	real	%15.4f	10-24	covariance matrix element
syy	3	real	%15.4f	26-40	covariance matrix element
szz	4	real	%15.4f	42-56	covariance matrix element
stt	5	real	%15.4f	58-72	covariance matrix element
sxy	6	real	%15.4f	74-88	covariance matrix element
sxz	7	real	%15.4f	90-104	covariance matrix element
syz	8	real	%15.4f	106-120	covariance matrix element
stx	9	real	%15.4f	122-136	covariance matrix element
sty	10	real	%15.4f	138-152	covariance matrix element
stz	11	real	%15.4f	154-168	covariance matrix element
sdobs	12	real	%9.4f	170-178	standard error of observation
smajax	13	real	%9.4f	180-188	semi-major axis of error
sminax	14	real	%9.4f	190-198	semi-minor axis of error
strike	15	real	%6.2f	200-205	strike of the semi-major axis
sdepth	16	real	%9.4f	207-215	depth error
stime	17	real	%8.2f	217-224	origin time error
conf	18	real	%5.3f	226-230	confidence
commid	19	integer	%8d	232-239	comment id
lddate	20	time	%17.5f	241-257	(epoch) time of last record modification

Relation:		**origin**			
Description:		Data on event location and size			
field name	no.	type	print format	character positions	attribute description
lat	1	real	%9.4f	1-9	estimated latitude
lon	2	real	%9.4f	11-19	estimated longitude
depth	3	real	%9.4f	21-29	estimated depth
time	4	time	%17.5f	31-47	epoch time
orid	5	integer	%8d	49-56	origin id
evid	6	integer	%8d	58-65	event id
jdate	7	yearday	%8d	67-74	julian date
nass	8	integer	%4d	76-79	number of associated phases
ndef	9	integer	%4d	81-84	number of locating phases
ndp	10	integer	%4d	86-89	number of depth phases
grn	11	integer	%8d	91-98	geographic region number
srn	12	integer	%8d	100-107	seismic region number
etype	13	string	%-2s	109-110	event type
review	14	string	%-4s	112-115	review status
depdp	15	real	%9.4f	117-125	estimated depth from depth phases
dtype	16	string	%-1s	127-127	depth method used
mb	17	real	%7.2f	129-135	body wave magnitude
mbid	18	integer	%8d	137-144	mb magid
ms	19	real	%7.2f	146-152	surface wave magnitude
msid	20	integer	%8d	154-161	ms magid
ml	21	real	%7.2f	163-169	local magnitude
mlid	22	integer	%8d	171-178	ml magid
algorithm	23	string	%-15s	180-194	processing algorithm used
auth	24	string	%-15s	196-210	source/originator
commid	25	integer	%8d	212-219	comment id
lddate	26	time	%17.5f	221-237	(epoch) time of last record modification

Relation:		**predarr**			
Description:		Earth model predictions of data associated with arrivals			
field name	no.	type	print format	character positions	attribute description
arid	1	integer	%8d	1-8	arrival id
orid	2	integer	%8d	10-17	origin id
time	3	time	%17.5f	19-35	epoch time
slow	4	real	%7.2f	37-43	observed slowness (s/deg)
seaz	5	real	%7.2f	45-51	station to event azimuth
ema	6	real	%7.2f	53-59	emergence angle
esaz	7	real	%7.2f	61-67	event to station azimuth
dip	8	real	%5.1f	69-73	Dip of a vector
lddate	9	time	%17.5f	75-91	(epoch) time of last record modification

Relation: **predmech**
Description: Predicted focal mechanism properties

field name	no.	type	print format	character positions	attribute description
arid	1	integer	%8d	1-8	arrival id
orid	2	integer	%8d	10-17	origin id
mechid	3	integer	%8d	19-26	mechanism id
fm	4	string	%-2s	28-29	first motion
radamp	5	real	%10.7f	31-40	Radiation pattern predicted amplitude
lddate	6	time	%17.5f	42-58	(epoch) time of last record modification

Relation: **remark**
Description: free format comment

field name	no.	type	print format	character positions	attribute description
commid	1	integer	%8d	1-8	comment id
lineno	2	integer	%8d	10-17	comment line number
remark	3	string	%-80s	19-98	free format comment
lddate	4	time	%17.5f	100-116	(epoch) time of last record modification

Relation: **schanloc**
Description: map foreign chan+loc code to local chan code

field name	no.	type	print format	character positions	attribute description
sta	1	string	%-6s	1-6	station
fchan	2	string	%-8s	8-15	foreign channel
loc	3	string	%-8s	17-24	SEED location code
chan	4	string	%-8s	26-33	channel
lddate	5	time	%17.5f	35-51	(epoch) time of last record modification

Relation: **sensor**
Description: Specific calibration information for physical channels

field name	no.	type	print format	character positions	attribute description
sta	1	string	%-6s	1-6	station
chan	2	string	%-8s	8-15	channel
time	3	time	%17.5f	17-33	epoch time
endtime	4	time	%17.5f	35-51	last valid time for data
inid	5	integer	%8d	53-60	instrument id
chanid	6	integer	%8d	62-69	channel operation id
jdate	7	yearday	%8d	71-78	julian date
calratio	8	real	%16.6f	80-95	calibration
calper	9	real	%16.6f	97-112	nominal calibration period
tshift	10	real	%6.2f	114-119	correction of data processing time
instant	11	string	%-1s	121-121	(y,n) discrete/continuing snapshot
lddate	12	time	%17.5f	123-139	(epoch) time of last record modification

Relation:		**site**			
Description:		Station location information			
field name	no.	type	print format	character positions	attribute description
sta	1	string	%-6s	1-6	station
ondate	2	yearday	%8d	8-15	Julian start date
offdate	3	yearday	%8d	17-24	Julian off date
lat	4	real	%9.4f	26-34	estimated latitude
lon	5	real	%9.4f	36-44	estimated longitude
elev	6	real	%9.4f	46-54	elevation
staname	7	string	%-50s	56-105	station description
statype	8	string	%-4s	107-110	station type: single station, virt. array, etc.
refsta	9	string	%-6s	112-117	reference station for array members
dnorth	10	real	%9.4f	119-127	offset from array reference (km)
deast	11	real	%9.4f	129-137	offset from array reference (km)
lddate	12	time	%17.5f	139-155	(epoch) time of last record modification

Relation:		**sitechan**			
Description:		Station-channel information			
field name	no.	type	print format	character positions	attribute description
sta	1	string	%-6s	1-6	station
chan	2	string	%-8s	8-15	channel
ondate	3	yearday	%8d	17-24	Julian start date
chanid	4	integer	%8d	26-33	channel operation id
offdate	5	yearday	%8d	35-42	Julian off date
ctype	6	string	%-4s	44-47	channel type
edepth	7	real	%9.4f	49-57	emplacement depth
hang	8	real	%6.1f	59-64	horizontal angle
vang	9	real	%6.1f	66-71	vertical angle
descrip	10	string	%-50s	73-122	channel description
lddate	11	time	%17.5f	124-140	(epoch) time of last record modification

Relation:		**snetsta**			
Description:		map seed net+sta code to local sta code			
field name	no.	type	print format	character positions	attribute description
snet	1	string	%-8s	1-8	SEED network code
fsta	2	string	%-6s	10-15	foreign station code
sta	3	string	%-6s	17-22	station
lddate	4	time	%17.5f	24-40	(epoch) time of last record modification

Relation:	**specdisc**			
Description:	Spectra file header and descriptive information			
field name	no.	type	print format	character positions	attribute description
tagname	1	string	%-8s	1-8	key (arid, orid, evid, etc.)
sta	2	string	%-6s	10-15	station
chan	3	string	%-8s	17-24	channel
time	4	time	%17.5f	26-42	epoch time
endtime	5	time	%17.5f	44-60	last valid time for data
phase	6	string	%-8s	62-69	associated phase
arid	7	integer	%8d	71-78	arrival id
rsptype	8	string	%-6s	80-85	response type
freqmin	9	real	%15.6lg	87-101	Frequency of first point in spectral file
freqmax	10	real	%15.6lg	103-117	Frequency of last point in spectral file
nfreq	11	integer	%8d	119-126	Number of frequencies in spectral file
df	12	real	%15.6lg	128-142	Frequency interval (Hertz) in spectral file
rayleigh	13	real	%15.6lg	144-158	Rayleigh bin size in cycles/sec
tbp	14	real	%10.1f	160-169	Time-bandwidth product of spectral file
scalib	15	real	%15.6lg	171-185	Spectral scale factor
twin	16	real	%9.2f	187-195	time window (s)
nwin	17	integer	%6d	197-202	Number of windows used to calculate spectra
offset	18	real	%6.2f	204-209	Offset between windowed segments of time-series
totdur	19	real	%12.2f	211-222	Total Duration of data used for spectra
demean	20	string	%-1s	224-224	Time-series was was demeaned
rsprm	21	string	%-1s	226-226	Response removed
taper	22	string	%-12s	228-239	Taper applied to time-series before fft
method	23	string	%-12s	241-252	Spectral estimation method
spectype	24	string	%-8s	254-261	Spectrum file type
units	25	string	%-12s	263-274	units of calib (e.g. nm, nm/sec, ...)
specfmt	26	string	%-12s	276-287	Format of spectra file
foff	27	integer	%10d	289-298	byte offset
dir	28	string	%-64s	300-363	directory
dfile	29	string	%-32s	365-396	data file
auth	30	string	%-15s	398-412	source/originator
lddate	31	time	%17.5f	414-430	(epoch) time of last record modification

Relation:	**sregion**				
Description:	Seismic region				
field name	no.	type	print format	character positions	attribute description
srn	1	integer	%8d	1-8	seismic region number
srname	2	string	%-40s	10-49	seismic region name
lddate	3	time	%17.5f	51-67	(epoch) time of last record modification

Relation:		**stage**			
Description:		filter stage calibration parameters			
field name	no.	type	print format	character positions	attribute description
sta	1	string	%-6s	1-6	station
chan	2	string	%-8s	8-15	channel
time	3	time	%17.5f	17-33	epoch time
endtime	4	time	%17.5f	35-51	last valid time for data
stageid	5	integer	%8d	53-60	stage number in the calibration response
ssident	6	string	%-16s	62-77	identifier (sensor ser no/sw revision)
gnom	7	real	%10.5g	79-88	nominal scaling factor
iunits	8	string	%-16s	90-105	inputs units of stage (e.g. V, cm/sec, ...)
ounits	9	string	%-16s	107-122	output units of stage (e.g. V, counts, ...)
gcalib	10	real	%10.6f	124-133	correction to scale factor
gtype	11	string	%-20s	135-154	stage type (seismometer,A/D,FIR filter,...)
izero	12	integer	%8d	156-163	index of FIR coeff. for 0th sample
decifac	13	integer	%8d	165-172	decimation factor
samprate	14	real	%11.7f	174-184	sampling rate in samples/sec
leadfac	15	real	%11.7f	186-196	leading factor
dir	16	string	%-64s	198-261	directory
dfile	17	string	%-32s	263-294	data file
lddate	18	time	%17.5f	296-312	(epoch) time of last record modification

Relation:		**stamag**			
Description:		Station magnitude			
field name	no.	type	print format	character positions	attribute description
magid	1	integer	%8d	1-8	magnitude id
sta	2	string	%-6s	10-15	station
arid	3	integer	%8d	17-24	arrival id
orid	4	integer	%8d	26-33	origin id
evid	5	integer	%8d	35-42	event id
phase	6	string	%-8s	44-51	associated phase
magtype	7	string	%-6s	53-58	magnitude type (ml, ms, mb, etc.)
magnitude	8	real	%7.2f	60-66	magnitude
uncertainty	9	real	%7.2f	68-74	magnitude uncertainty
auth	10	string	%-15s	76-90	source/originator
commid	11	integer	%8d	92-99	comment id
lddate	12	time	%17.5f	101-117	(epoch) time of last record modification

Relation:	**stassoc**			
Description:	Arrivals from a single station grouped into an event			
field name	no.	type	print format	character positions	attribute description
stassid	1	integer	%8d	1-8	stassoc id
sta	2	string	%-6s	10-15	station
etype	3	string	%-2s	17-18	event type
review	4	string	%-4s	20-23	review status
location	5	string	%-32s	25-56	apparent location description
dist	6	real	%7.2f	58-64	estimated distance
azimuth	7	real	%7.2f	66-72	observed azimuth
lat	8	real	%9.4f	74-82	estimated latitude
lon	9	real	%9.4f	84-92	estimated longitude
depth	10	real	%9.4f	94-102	estimated depth
time	11	time	%17.5f	104-120	epoch time
imb	12	real	%7.2f	122-128	initial estimated mb
ims	13	real	%7.2f	130-136	initial estimated ms
iml	14	real	%7.2f	138-144	initial estimated ml
auth	15	string	%-15s	146-160	source/originator
commid	16	integer	%8d	162-169	comment id
lddate	17	time	%17.5f	171-187	(epoch) time of last record modification

Relation:	**stgrid**			
Description:	Slowness-Time grid parameters			
field name	no.	type	print format	character positions	attribute description
sta	1	string	%-6s	1-6	station
refsta	2	string	%-6s	8-13	reference station for array members
chan	3	string	%-8s	15-22	channel
time	4	time	%17.5f	24-40	epoch time
endtime	5	time	%17.5f	42-58	last valid time for data
twin	6	real	%9.2f	60-68	time window (s)
filter	7	string	%-30s	70-99	filter description
azimuth	8	real	%7.2f	101-107	observed azimuth
smin	9	real	%7.4f	109-115	minimum slowness (s/km)
smax	10	real	%7.4f	117-123	maximum slowness (s/km)
ns	11	integer	%8d	125-132	number of slowness values
dtime	12	real	%9.2f	134-142	time step (s)
nt	13	integer	%8d	144-151	number of time values
datatype	14	string	%-2s	153-154	numeric storage
dir	15	string	%-64s	156-219	directory
dfile	16	string	%-32s	221-252	data file
foff	17	integer	%10d	254-263	byte offset
lddate	18	time	%17.5f	265-281	(epoch) time of last record modification

Relation:		**wfdisc**			
Description:		Waveform file header and descriptive information			
field name	no.	type	print format	character positions	attribute description
sta	1	string	%-6s	1-6	station
chan	2	string	%-8s	8-15	channel
time	3	time	%17.5f	17-33	epoch time
wfid	4	integer	%8d	35-42	waveform id
chanid	5	integer	%8d	44-51	channel operation id
jdate	6	yearday	%8d	53-60	julian date
endtime	7	time	%17.5f	62-78	last valid time for data
nsamp	8	integer	%8d	80-87	number of samples
samprate	9	real	%11.7f	89-99	sampling rate in samples/sec
calib	10	real	%16.9g	101-116	nominal calibration
calper	11	real	%16.6f	118-133	nominal calibration period
instype	12	string	%-6s	135-140	instrument code
segtype	13	string	%-1s	142-142	detector measurement type / natural units
datatype	14	string	%-2s	144-145	numeric storage
clip	15	string	%-1s	147-147	clipped flag
dir	16	string	%-64s	149-212	directory
dfile	17	string	%-32s	214-245	data file
foff	18	integer	%10d	247-256	byte offset
commid	19	integer	%8d	258-265	comment id
lddate	20	time	%17.5f	267-283	(epoch) time of last record modification

Relation:		**wfedit**			
Description:		Describes a waveform edit			
field name	no.	type	print format	character positions	attribute description
sta	1	string	%-6s	1-6	station
chan	2	string	%-8s	8-15	channel
edid	3	integer	%8d	17-24	edit id
time	4	time	%17.5f	26-42	epoch time
endtime	5	time	%17.5f	44-60	last valid time for data
probtype	6	string	%-8s	62-69	problem type id
edittype	7	string	%-8s	71-78	edittype id
auth	8	string	%-15s	80-94	source/originator
commid	9	integer	%8d	96-103	comment id
lddate	10	time	%17.5f	105-121	(epoch) time of last record modification

Relation:		**wfmeas**			
Description:		waveform measurements			
field name	no.	type	print format	character positions	attribute description
sta	1	string	%-6s	1-6	station
chan	2	string	%-8s	8-15	channel
meastype	3	string	%-10s	17-26	measurement type
filter	4	string	%-30s	28-57	filter description
time	5	time	%17.5f	59-75	epoch time
endtime	6	time	%17.5f	77-93	last valid time for data
tmeas	7	time	%17.5f	95-111	epoch time
twin	8	real	%9.2f	113-121	time window (s)
val1	9	real	%12.3f	123-134	first measured value on a waveform
val2	10	real	%12.3f	136-147	second measured value on a waveform
units1	11	string	%-12s	149-160	units for waveform measurement
units2	12	string	%-12s	162-173	units of a waveform measurement
arid	13	integer	%8d	175-182	arrival id
auth	14	string	%-15s	184-198	source/originator
lddate	15	time	%17.5f	200-216	(epoch) time of last record modification

Relation:		**wfrms**			
Description:		Waveform RMS values			
field name	no.	type	print format	character positions	attribute description
sta	1	string	%-6s	1-6	station
chan	2	string	%-8s	8-15	channel
time	3	time	%17.5f	17-33	epoch time
twin	4	real	%9.2f	35-43	time window (s)
filter	5	string	%-30s	45-74	filter description
fc	6	real	%11.6f	76-86	center frequency
arid	7	integer	%8d	88-95	arrival id
stype	8	string	%-1s	97-97	signal type
segtype	9	string	%-1s	99-99	detector measurement type / natural units
rms	10	real	%13.6e	101-113	Root-mean-square value
lddate	11	time	%17.5f	115-131	(epoch) time of last record modification

Relation:		**wftag**			
Description:		Waveform mapping file			
field name	no.	type	print format	character positions	attribute description
tagname	1	string	%-8s	1-8	key (arid, orid, evid, etc.)
tagid	2	integer	%8d	10-17	tagname value
wfid	3	integer	%8d	19-26	waveform id
lddate	4	time	%17.5f	28-44	(epoch) time of last record modification

Relation:		**wftape**			
Description:		Waveform tape file header and descriptive information			
field name	no.	type	print format	character positions	attribute description
sta	1	string	%-6s	1-6	station
chan	2	string	%-8s	8-15	channel
time	3	time	%17.5f	17-33	epoch time
wfid	4	integer	%8d	35-42	waveform id
chanid	5	integer	%8d	44-51	channel operation id
jdate	6	yearday	%8d	53-60	julian date
endtime	7	time	%17.5f	62-78	last valid time for data
nsamp	8	integer	%8d	80-87	number of samples
samprate	9	real	%11.7f	89-99	sampling rate in samples/sec
calib	10	real	%16.9g	101-116	nominal calibration
calper	11	real	%16.6f	118-133	nominal calibration period
instype	12	string	%-6s	135-140	instrument code
segtype	13	string	%-1s	142-142	detector measurement type / natural units
datatype	14	string	%-2s	144-145	numeric storage
clip	15	string	%-1s	147-147	clipped flag
dir	16	string	%-64s	149-212	directory
dfile	17	string	%-32s	214-245	data file
volname	18	string	%-6s	247-252	tape name
tapefile	19	integer	%5d	254-258	tape file number
tapeblock	20	integer	%5d	260-264	block number in tape file
commid	21	integer	%8d	266-273	comment id
lddate	22	time	%17.5f	275-291	(epoch) time of last record modification

Relation:		**wftar**			
Description:		Tar archived waveform file header and descriptive information			
field name	no.	type	print format	character positions	attribute description
sta	1	string	%-6s	1-6	station
chan	2	string	%-8s	8-15	channel
time	3	time	%17.5f	17-33	epoch time
wfid	4	integer	%8d	35-42	waveform id
chanid	5	integer	%8d	44-51	channel operation id
jdate	6	yearday	%8d	53-60	julian date
endtime	7	time	%17.5f	62-78	last valid time for data
nsamp	8	integer	%8d	80-87	number of samples
samprate	9	real	%11.7f	89-99	sampling rate in samples/sec
calib	10	real	%16.9g	101-116	nominal calibration
calper	11	real	%16.6f	118-133	nominal calibration period
instype	12	string	%-6s	135-140	instrument code
segtype	13	string	%-1s	142-142	detector measurement type / natural units
datatype	14	string	%-2s	144-145	numeric storage
clip	15	string	%-1s	147-147	clipped flag
dir	16	string	%-64s	149-212	directory
dfile	17	string	%-32s	214-245	data file
foff	18	integer	%10d	247-256	byte offset
tapename	19	string	%-20s	258-277	tape name
fileno	20	integer	%6d	279-284	tape file number
tfile	21	string	%-64s	286-349	tar tape file
tfoff	22	integer	%10d	351-360	byte offset
commid	23	integer	%8d	362-369	comment id
lddate	24	time	%17.5f	371-387	(epoch) time of last record modification

Relation:		**alarmcomm**			
Description:		attempts to notify people of alarms			
field name	no.	type	print format	character positions	attribute description
alarmid	1	integer	%8d	1-8	alarm id
time	2	time	%17.5f	10-26	epoch time
recipient	3	string	%-80s	28-107	Recipient of an email alarm
delaysec	4	real	%8.1lf	109-116	calldown delay in seconds
lddate	5	time	%17.5f	118-134	(epoch) time of last record modification

Relation:	**alarms**			
Description:	alarm conditions			
field name	no.	type	print format	character positions	attribute description
alarmid	1	integer	%8d	1-8	alarm id
alarmkey	2	string	%-30s	10-39	key identifying a particular alarm
alarmclass	3	string	%-20s	41-60	type of alarm
alarmname	4	string	%-30s	62-91	name of alarm
time	5	time	%17.5f	93-109	epoch time
subject	6	string	%-50s	111-190	Subject of an email alarm
evid	7	integer	%8d	192-199	event id
orid	8	integer	%8d	201-208	origin id
acknowledged	9	string	%-2s	210-211	Whether an alarm has been acknowledged
acktime	10	time	%17.5f	213-229	time of alarm acknowledgment
ackauth	11	string	%-50s	231-280	party acknowledging an alarm.
dir	12	string	%-64s	282-345	directory
dfile	13	string	%-32s	347-378	data file
foff	14	integer	%10d	380-389	byte offset
lddate	15	time	%17.5f	391-407	(epoch) time of last record modification

Relation:	**arrival_tshift**			
Description:	Arrival time corrected			
field name	no.	type	print format	character positions	attribute description
arid	1	integer	%8d	1-8	arrival id
time	2	time	%17.5f	10-26	epoch time
original_time	3	time	%17.5f	28-44	time correction
lddate	4	time	%17.5f	46-62	(epoch) time of last record modification

Relation:	**b051**			
Description:	Station Comment Blockette			
field name	no.	type	print format	character positions	attribute description
sta	1	string	%-6s	1-6	station
time	2	time	%17.5f	8-24	epoch time
endtime	3	time	%17.5f	26-42	last valid time for data
seed_comment	4	string	%-70s	44-113	Comment to be placed in seed_comment dictionary
seed_class	5	string	%-1s	115-115	Class code
seed_units	6	string	%-20s	117-136	Basic Unit Name
lddate	7	time	%17.5f	138-154	(epoch) time of last record modification

Relation:	**b059**			
Description:	Channel Comment Blockette			
field name	no.	type	print format	character positions	attribute description
sta	1	string	%-6s	1-6	station
chan	2	string	%-8s	8-15	channel
time	3	time	%17.5f	17-33	epoch time
endtime	4	time	%17.5f	35-51	last valid time for data
seed_comment	5	string	%-70s	53-122	Comment to be placed in seed_comment dictionary
seed_class	6	string	%-1s	124-124	Class code
seed_units	7	string	%-20s	126-145	Basic Unit Name
lddate	8	time	%17.5f	147-163	(epoch) time of last record modification

Relation:	**balerlist**			
Description:	Table listing of information from Baler 14			
field name	no.	type	print format	character positions	attribute description
dlname	1	string	%s	1-32	dbbuild datalogger selection name
time	2	time	%17.5f	34-50	epoch time
endtime	3	time	%17.5f	52-68	last valid time for data
target	4	string	%16s	70-85	q3302orb target name
connection	5	string	%16s	87-102	connection status of Q330
q330sn	6	string	%-16s	104-119	q330 serial number
inp	7	string	%-50s	121-170	identification tag
balersn	8	string	%-6s	172-177	baler serial number
balerfirm	9	string	%-10s	179-188	baler firmware revision
baleron	10	string	%-3s	190-192	baler turned on
onsecs	11	integer	%6d	194-199	Power on start in seconds
htmlinfo	12	string	%-3s	201-203	html file accessbility
htmlsecs	13	integer	%6d	205-210	html response in seconds
msdinfo	14	string	%-3s	212-214	miniseed listing accessbility
msdsecs	15	integer	%6d	216-221	miniseed listing time in seconds
data_start	16	time	%17.5f	223-239	data start epoch time
data_end	17	time	%17.5f	241-257	last valid time for data
lddate	18	time	%17.5f	259-275	(epoch) time of last record modification

Relation:		**calresult**			
Description:		results of a random binary calibration			
field name	no.	type	print format	character positions	attribute description
net	1	string	%-8s	1-8	unique network identifier
sta	2	string	%-6s	10-15	station
chan	3	string	%-8s	17-24	channel
time	4	time	%17.5f	26-42	epoch time
endtime	5	time	%17.5f	44-60	last valid time for data
calseq	6	string	%-25	62-86	Calibration sequence identifier
caltype	7	string	%-8s	88-95	Calibration type
runtime	8	time	%17.5lf	97-113	processing run time
auth	9	string	%-15s	115-129	source/originator
hostname	10	string	%-25	131-155	computer host name
calinput	11	string	%-1s	157-157	Calibration input switch
caldampr	12	real	%13.6e	159-173	Calibrator damping resistor
samprate	13	real	%11.7f	175-185	sampling rate in samples/sec
fp	14	real	%10.5lf	187-194	Free period of the seismometer
damp0	15	real	%8.5lf	196-203	Seismometer free period damping ratio
calib	16	real	%16.9g	205-220	nominal calibration
calper	17	real	%16.6f	222-237	nominal calibration period
rsptype	18	string	%-6s	239-244	response type
caliberr	19	real	%10.3f	246-255	calib error
calcmp	20	string	%-3s	257-259	calib comparison disposition
rspcmp	21	string	%-3s	261-263	response comparison disposition
dir	22	string	%-64s	265-328	directory
dfile	23	string	%-32s	330-361	data file
dfilee	24	string	%-32s	363-394	error data file
lddate	25	time	%17.5f	396-412	(epoch) time of last record modification

Relation:		**calwf**			
Description:		random binary calibration waveforms			
field name	no.	type	print format	character positions	attribute description
net	1	string	%-8s	1-8	unique network identifier
sta	2	string	%-6s	10-15	station
chan	3	string	%-8s	17-24	channel
time	4	time	%17.5f	26-42	epoch time
endtime	5	time	%17.5f	44-60	last valid time for data
calseq	6	string	%-25	62-86	Calibration sequence identifier
caltype	7	string	%-8s	88-95	Calibration type
auth	8	string	%-15s	97-111	source/originator
calerr	9	string	%-3s	113-115	Calibration waveform disposition
tsettle	10	real	%8.5lf	117-124	Calibrator settling time duration
trecov	11	real	%8.5lf	126-133	Calibrator recovery time duration
calamp	12	real	%10.6lf	135-144	Calibration amplitude
calinput	13	string	%-1s	146-146	Calibration input switch
caldrive	14	string	%-1s	148-148	Calibration drive type
caldampr	15	real	%13.6e	150-164	Calibrator damping resistor
calseed	16	string	%-10s	166-175	Seed for random binary calibration
perdac	17	real	%8.5lf	177-184	Period of the calibrator DAC
calfreq	18	real	%8.2lf	186-193	Frequency of the calibrator sine wave signal
lddate	19	time	%17.5f	195-211	(epoch) time of last record modification

Relation:		**changed**			
Description:		sta/chan parameter change			
field name	no.	type	print format	character positions	attribute description
tagname	1	string	%-8s	1-8	key (arid, orid, evid, etc.)
sta	2	string	%-6s	10-15	station
chan	3	string	%-8s	17-24	channel
time	4	time	%17.5f	26-42	epoch time
param	5	string	%-1s	44-44	type of parameter change
lddate	6	time	%17.5f	46-62	(epoch) time of last record modification

Relation:		**chanperf**			
Description:		channel performance			
field name	no.	type	print format	character positions	attribute description
sta	1	string	%-6s	1-6	station
chan	2	string	%-8s	8-15	channel
time	3	time	%17.5f	17-33	epoch time
endtime	4	time	%17.5f	35-51	last valid time for data
perf	5	real	%6.2f	53-58	percentage of data returned over time range
lddate	6	time	%17.5f	60-76	(epoch) time of last record modification

Relation:	**comm**			
Description:	Table for USArray station commmunications			
field name	no.	type	print format	character positions	attribute description
sta	1	string	%-6s	1-6	station
time	2	time	%17.5f	8-24	epoch time
endtime	3	time	%17.5f	26-42	last valid time for data
commtype	4	string	%50s	44-93	communications used
provider	5	string	%-15s	95-109	communications provider used
lddate	6	time	%17.5f	111-127	(epoch) time of last record modification

Relation:	**deployment**			
Description:	Table for USArray operations			
field name	no.	type	print format	character positions	attribute description
net	1	string	%-8s	1-8	unique network identifier
snet	2	string	%-8s	10-17	SEED network code
sta	3	string	%-6s	19-24	station
time	4	time	%17.5f	26-42	epoch time
endtime	5	time	%17.5f	44-60	last valid time for data
equip_install	6	time	%17.5f	62-78	epoch time
equip_remove	7	time	%17.5f	80-96	last valid time for data
cert_time	8	time	%17.5f	98-114	epoch time
decert_time	9	time	%17.5f	116-132	last valid time for data
pdcc	10	string	%-15s	134-148	primary data collection center
sdcc	11	string	%-15s	150-164	secondary data collection center
lddate	12	time	%17.5f	166-182	(epoch) time of last record modification

Relation:	**detection**			
Description:	Detection start/stop times			
field name	no.	type	print format	character positions	attribute description
srcid	1	string	%-64s	1-64	orb source name
tagname	2	string	%-8s	66-73	key (arid, orid, evid, etc.)
sta	3	string	%-6s	75-80	station
chan	4	string	%-8s	82-89	channel
time	5	time	%17.5f	91-107	epoch time
arid	6	integer	%8d	109-116	arrival id
state	7	string	%-3s	118-120	detector state
filter	8	string	%-30s	122-151	filter description
snr	9	real	%10.5g	153-162	signal to noise ratio
lddate	10	time	%17.5f	164-180	(epoch) time of last record modification

Relation: **detev**
Description: Complete event detection parameters

field name	no.	type	print format	character positions	attribute description
sta	1	string	%-6s	1-6	station
chan	2	string	%-8s	8-15	channel
filter	3	string	%-30s	17-46	filter description
time	4	time	%17.5f	48-64	epoch time
tron	5	real	%12.5f	66-77	relative on time
troff	6	real	%12.5f	79-90	relative off time
iphase	7	string	%-8s	92-99	reported phase
snr	8	real	%10.5g	101-110	signal to noise ratio
lddate	9	time	%17.5f	112-128	(epoch) time of last record modification

Relation: **digitizer**
Description: digitizer/calibrator parameters

field name	no.	type	print format	character positions	attribute description
net	1	string	%-8s	1-8	unique network identifier
sta	2	string	%-6s	10-15	station
chan	3	string	%-8s	17-24	channel
time	4	time	%17.5f	26-42	epoch time
endtime	5	time	%17.5f	44-60	last valid time for data
model	6	string	%-15	62-76	Model
manu	7	string	%-15	78-92	Manufacturer
ssident	8	string	%-16s	94-109	identifier (sensor ser no/sw revision)
samprate	9	real	%11.7f	111-121	sampling rate in samples/sec
phchan	10	integer	%3d	123-125	Digitizer physical channel number
lddate	11	time	%17.5f	127-143	(epoch) time of last record modification

Relation: **dlacq**
Description: dataloggers acquisition characteristics

field name	no.	type	print format	character positions	attribute description
model	1	string	%-15	1-15	Model
ssident	2	string	%-16s	17-32	identifier (sensor ser no/sw revision)
time	3	time	%17.5f	34-50	epoch time
endtime	4	time	%17.5f	52-68	last valid time for data
dlname	5	string	%s	70-101	dbbuild datalogger selection name
dlnet	6	string	%-2s	103-104	Datalogger network code
dlsta	7	string	%s	106-121	datalogger station id
dlauth	8	string	%-16s	123-138	Datalogger authentication code
dlip	9	string	%-32s	140-171	Datalogger ip address
dlport	10	string	%-8s	173-180	Datalogger port number
acqparams	11	string	%-16s	182-197	Acquisition parameters
acqmode	12	string	%-16s	199-214	Acquisition mode
lddate	13	time	%17.5f	216-232	(epoch) time of last record modification

Relation:	**dlcalwf**			
Description:	datalogger calibration waveform reference			
field name	no.	type	print format	character positions	attribute description
snet	1	string	%-8s	1-8	SEED network code
fsta	2	string	%-6s	10-15	foreign station code
fchan	3	string	%-8s	17-24	foreign channel
loc	4	string	%-8s	26-33	SEED location code
time	5	time	%17.5f	35-51	epoch time
endtime	6	time	%17.5f	53-69	last valid time for data
model	7	string	%-15	71-85	Model
ssident	8	string	%-16s	87-102	identifier (sensor ser no/sw revision)
dlcalseq	9	string	%-30	104-133	Calibration sequence identifier
dlcaltype	10	string	%-16s	135-150	Calibration type
dlcalerr	11	string	%-3s	152-154	Calibration waveform disposition
dlcalinput	12	string	%-1s	156-156	Calibration input switch
dlcalchanbm	13	string	%-8s	158-165	Channel bitmap
phchan	14	integer	%3d	167-169	Digitizer physical channel number
samprate	15	real	%11.7f	171-181	sampling rate in samples/sec
dlcalamp	16	real	%10.8lf	183-192	Calibration amplitude
dlcalfreq	17	real	%10.6lf	194-201	Frequency of the calibrator sine wave signal
dlcalsettle	18	real	%8.5lf	203-210	Calibrator settling time duration
dlcaltrailer	19	real	%8.5lf	212-219	Calibrator recovery time duration
lddate	20	time	%17.5f	221-237	(epoch) time of last record modification

Relation:	**dlchannel**			
Description:	datalogger channel mappings			
field name	no.	type	print format	character positions	attribute description
snet	1	string	%-8s	1-8	SEED network code
fsta	2	string	%-6s	10-15	foreign station code
fchan	3	string	%-8s	17-24	foreign channel
loc	4	string	%-8s	26-33	SEED location code
time	5	time	%17.5f	35-51	epoch time
endtime	6	time	%17.5f	53-69	last valid time for data
model	7	string	%-15	71-85	Model
ssident	8	string	%-16s	87-102	identifier (sensor ser no/sw revision)
samprate	9	real	%11.7f	104-114	sampling rate in samples/sec
phchan	10	integer	%3d	116-118	Digitizer physical channel number
stream	11	integer	%8d	120-127	stream number
lddate	12	time	%17.5f	129-145	(epoch) time of last record modification

Relation:	**dlevent**			
Description:	interactions with datalogger			
field name	no.	type	print format	character positions	attribute description
dlname	1	string	%s	1-32	dbbuild datalogger selection name
time	2	time	%17.5f	34-50	epoch time
dlevtype	3	string	%s	52-81	datalogger event
dlcomment	4	string	%s	83-262	datalogger event comment
lddate	5	time	%17.5f	264-280	(epoch) time of last record modification

Relation:		**dlsensor**			
Description:		datalogger to sensor mappings			
field name	no.	type	print format	character positions	attribute description
dlmodel	1	string	%-15	1-15	Datalogger model
dlident	2	string	%-16s	17-32	Datalogger identifier (serial number)
chident	3	string	%-16s	34-49	Channel group identifier
time	4	time	%17.5f	51-67	epoch time
endtime	5	time	%17.5f	69-85	last valid time for data
snmodel	6	string	%-15	87-101	Sensor model
snident	7	string	%-16s	103-118	Sensor identifier (serial number)
lddate	8	time	%17.5f	120-136	(epoch) time of last record modification

Relation:		**dlsite**			
Description:		dataloggers site characteristics			
field name	no.	type	print format	character positions	attribute description
model	1	string	%-15	1-15	Model
ssident	2	string	%-16s	17-32	identifier (sensor ser no/sw revision)
time	3	time	%17.5f	34-50	epoch time
endtime	4	time	%17.5f	52-68	last valid time for data
dlname	5	string	%s	70-101	dbbuild datalogger selection name
idtag	6	string	%-12s	103-114	identification tag
lat	7	real	%9.4f	116-124	estimated latitude
lon	8	real	%9.4f	126-134	estimated longitude
elev	9	real	%9.4f	136-144	elevation
commtype	10	string	%50s	146-195	communications used
provider	11	string	%-15s	197-211	communications provider used
lddate	12	time	%17.5f	213-229	(epoch) time of last record modification

Relation:		**dmcseed**			
Description:		Seed file information			
field name	no.	type	print format	character positions	attribute description
dfile	1	string	%-32s	1-32	data file
dmcid	2	integer	%5d	34-38	id number for IRIS DMC
net	3	string	%-8s	40-47	unique network identifier
yearday	4	yearday	%8d	49-56	julian date
cksum	5	real	%12.0lf	58-69	Check sum
totbytes	6	integer	%10d	71-80	size of file in bytes
hostname	7	string	%-25	82-106	computer host name
dir	8	string	%-64s	108-171	directory
outdev	9	string	%-15s	173-187	output device
tapename	10	string	%-20s	189-208	tape name
fileno	11	integer	%6d	210-215	tape file number
lddate	12	time	%17.5f	217-233	(epoch) time of last record modification

Relation:	**dmcwf**			
Description:	Seed archived waveform file header and descriptive information			
field name	no.	type	print format	character positions	attribute description
sta	1	string	%-6s	1-6	station
chan	2	string	%-8s	8-15	channel
time	3	time	%17.5f	17-33	epoch time
endtime	4	time	%17.5f	35-51	last valid time for data
nsamp	5	integer	%8d	53-60	number of samples
samprate	6	real	%11.7f	62-72	sampling rate in samples/sec
calib	7	real	%16.9g	74-89	nominal calibration
calper	8	real	%16.6f	91-106	nominal calibration period
segtype	9	string	%-1s	108-108	detector measurement type / natural units
datatype	10	string	%-2s	110-111	numeric storage
foff	11	integer	%10d	113-122	byte offset
dfile	12	string	%-32s	124-155	data file
timever	13	time	%17.5lf	157-173	verification time
lddate	14	time	%17.5f	175-191	(epoch) time of last record modification

Relation:	**eids**			
Description:	EIDS versions of origin information			
field name	no.	type	print format	character positions	attribute description
orid	1	integer	%8d	1-8	origin id
time	2	time	%17.5f	10-26	epoch time
dir	3	string	%-64s	28-91	directory
dfile	4	string	%-32s	93-124	data file
lddate	5	time	%17.5f	126-142	(epoch) time of last record modification

Relation:	**gap**			
Description:	data gaps			
field name	no.	type	print format	character positions	attribute description
tagname	1	string	%-8s	1-8	key (arid, orid, evid, etc.)
sta	2	string	%-6s	10-15	station
chan	3	string	%-8s	17-24	channel
time	4	time	%17.5f	26-42	epoch time
tgap	5	real	%17.5f	44-60	length of time for a data gap
filled	6	string	%-1s	62-62	'y' indicates gap was filled with missing flag
lddate	7	time	%17.5f	64-80	(epoch) time of last record modification

Relation:	**gps**			
Description:	gps clock locations			
field name	no.	type	print format	character positions	attribute description
net	1	string	%-8s	1-8	unique network identifier
sta	2	string	%-6s	10-15	station
time	3	time	%17.5f	17-33	epoch time
lat	4	real	%9.4f	35-43	estimated latitude
lon	5	real	%9.4f	45-53	estimated longitude
elev	6	real	%9.4f	55-63	elevation
nsat	7	integer	%6d	65-70	number of satellites locked for location estimate
gpsqual	8	string	%-6s	72-77	indicator of gps clock lock quality
insname	9	string	%-50s	79-128	instrument name
lddate	10	time	%17.5f	130-146	(epoch) time of last record modification

Relation:	**gsnspec**			
Description:	gsn ground noise levels			
field name	no.	type	print format	character positions	attribute description
sta	1	string	%-6s	1-6	station
chan	2	string	%-8s	8-15	channel
insname	3	string	%-50s	17-66	instrument name
period	4	real	%12.3f	68-79	period for measurement
fc	5	real	%11.6f	81-91	center frequency
pc_1	6	real	%12.3f	93-104	1 percentile of acceleration specta
pc_5	7	real	%12.3f	106-117	5 percentile of acceleration specta
pc_25	8	real	%12.3f	119-130	25 percentile of acceleration specta
pc_50	9	real	%12.3f	132-143	50 percentile of acceleration specta
time	10	time	%17.5f	145-161	epoch time
endtime	11	time	%17.5f	163-179	last valid time for data
lddate	12	time	%17.5f	181-197	(epoch) time of last record modification

Relation:	**iptable**				
Description:	lookup table for stations with dynamic ip addresses				
field name	no.	type	print format	character positions	attribute description
id	1	string	%s	1-32	station identifier used to lookup ip address/port number
address	2	string	%s	34-65	ip address (and sometimes port number)
lddate	3	time	%17.5f	67-83	(epoch) time of last record modification

Relation: **latency**
Description: packet latency

field name	no.	type	print format	character positions	attribute description
snet	1	string	%-8s	1-8	SEED network code
sta	2	string	%-6s	10-15	station
chan	3	string	%-8s	17-24	channel
time	4	time	%17.5f	26-42	epoch time
period	5	real	%12.3f	44-55	period for measurement
cnt	6	integer	%10d	57-66	count of measurements
mean	7	real	%12.3f	68-79	average latency
stddev	8	real	%12.3f	81-92	standard deviation
latmin	9	real	%12.3f	94-105	minimum latency
latmax	10	real	%12.3f	107-118	maximum latency
lddate	11	time	%17.5f	120-136	(epoch) time of last record modification

Relation: **netperf**
Description: network performance

field name	no.	type	print format	character positions	attribute description
snet	1	string	%-8s	1-8	SEED network code
time	2	time	%17.5f	10-26	epoch time
endtime	3	time	%17.5f	28-44	last valid time for data
npsta	4	integer	%5d	46-50	number of stations used to calculate performance
npchan	5	integer	%5d	52-56	number of channels used to calculate performance
perf	6	real	%6.2f	58-63	percentage of data returned over time range
lddate	7	time	%17.5f	65-81	(epoch) time of last record modification

Relation: **nominalresp**
Description: sensor nominal response parameters

field name	no.	type	print format	character positions	attribute description
net	1	string	%-8s	1-8	unique network identifier
sta	2	string	%-6s	10-15	station
chan	3	string	%-8s	17-24	channel
time	4	time	%17.5f	26-42	epoch time
endtime	5	time	%17.5f	44-60	last valid time for data
samprate	6	real	%11.7f	62-72	sampling rate in samples/sec
fp	7	real	%10.5lf	74-81	Free period of the seismometer
damp0	8	real	%8.5lf	83-90	Seismometer free period damping ratio
calib	9	real	%16.9g	92-107	nominal calibration
calper	10	real	%16.6f	109-124	nominal calibration period
calibl	11	real	%16.6lf	126-141	loopback calibration
rsptype	12	string	%-6s	143-148	response type
dir	13	string	%-64s	150-213	directory
dfile	14	string	%-32s	215-246	data file
dfilel	15	string	%-32s	248-279	data file for loopback response
lddate	16	time	%17.5f	281-297	(epoch) time of last record modification

Relation:	**q330comm**				
Description:	q330 communications information for USArray				
field name	no.	type	print format	character positions	attribute description
dlsta	1	string	%s	1-16	datalogger station id
time	2	time	%17.5f	18-34	epoch time
endtime	3	time	%17.5f	36-52	last valid time for data
inp	4	string	%-50s	54-103	identification tag
ssident	5	string	%-16s	105-120	identifier (sensor ser no/sw revision)
idtag	6	string	%-12s	122-133	identification tag
lat	7	real	%9.4f	135-143	estimated latitude
lon	8	real	%9.4f	145-153	estimated longitude
elev	9	real	%9.4f	155-163	elevation
thr	10	integer	%8d	165-172	Throttle rate
lddate	11	time	%17.5f	174-190	(epoch) time of last record modification

Relation:	**q730b**				
Description:	Q730B digitizer parameters				
field name	no.	type	print format	character positions	attribute description
ssident	1	string	%-16s	1-16	identifier (sensor ser no/sw revision)
time	2	time	%17.5f	18-34	epoch time
endtime	3	time	%17.5f	36-52	last valid time for data
rsettings	4	integer	%10d	54-63	default calibrator relay settings
dsettings	5	integer	%10d	65-74	default calibrator variable damping settings
nchans	6	integer	%3d	76-78	Digitizer number of physical channels
preamp	7	string	%-3s	80-82	preamp board?
vd	8	string	%-3s	84-86	variable damping enabled?
preampgain	9	real	%10.3f	88-97	preamp gain
rcurrent	10	real	%13.6e	99-113	Calibrator current resistor
rpreamp	11	real	%13.6e	115-129	Preamp impedence
rfdamp	12	real	%13.6e	131-145	Fixed damping shunt resistance
rterm	13	real	%13.6e	147-161	Termination resistor
rvfdamp	14	real	%13.6e	163-177	Fixed variable damping shunt resistance
rvdampmin	15	real	%13.6e	179-193	Minimum variable damping resistance
rvdampmax	16	real	%13.6e	195-209	Maximum variable damping resistance
vdamprperc	17	real	%15.8e	211-225	Variable damping per count
dacvperc	18	real	%15.8e	227-241	DAC counts to volts factor
dacvmax	19	real	%15.8e	243-257	DAC maximum volts setting
lddate	20	time	%17.5f	259-275	(epoch) time of last record modification

Relation:		**qgrid**			
Description:		dbgme grid files			
field name	no.	type	print format	character positions	attribute description
qgridname	1	string	%-30s	1-30	Name of a particular configuration of grid
recipe	2	string	%-15s	32-46	recipe name
qgridtype	3	string	%-20s	48-67	qgrid type
time	4	time	%17.5f	69-85	epoch time
endtime	5	time	%17.5f	87-103	last valid time for data
minlat	6	real	%9.4lf	105-113	lowest latitude of dbgme grid
maxlat	7	real	%9.4lf	115-123	highest latitude of dbgme grid
minlon	8	real	%9.4lf	125-133	westernmost longitude of dbgme grid
maxlon	9	real	%9.4lf	135-143	easternmost longitude of dbgme grid
qdlat	10	real	%12.6lf	145-156	grid spacing along meridians (degrees)
qdlon	11	real	%12.6lf	158-169	grid spacing across meridians (degrees)
nlat	12	integer	%10d	171-180	Number of grid points in latitude direction
nlon	13	integer	%10d	182-191	Number of grid points in longitude direction
qgridfmt	14	string	%-10s	193-202	Format of qgrid
units	15	string	%-12s	204-215	units of calib (e.g. nm, nm/sec, ...)
maxval	16	real	%12.3f	217-228	Maximum absolute value of a measurement grid
dir	17	string	%-64s	230-293	directory
dfile	18	string	%-32s	295-326	data file
foff	19	integer	%10d	328-337	byte offset
orid	20	integer	%8d	339-346	origin id
auth	21	string	%-15s	348-362	source/originator
lddate	22	time	%17.5f	364-380	(epoch) time of last record modification

Relation:		**ratechange**			
Description:		sta/chan sample rate change			
field name	no.	type	print format	character positions	attribute description
tagname	1	string	%-8s	1-8	key (arid, orid, evid, etc.)
sta	2	string	%-6s	10-15	station
chan	3	string	%-8s	17-24	channel
time	4	time	%17.5f	26-42	epoch time
endtime	5	time	%17.5f	44-60	last valid time for data
minrate	6	real	%11.7lf	62-72	sampling rate in samples/sec
maxrate	7	real	%11.7lf	74-84	sampling rate in samples/sec
lddate	8	time	%17.5f	86-102	(epoch) time of last record modification

Relation:		**replayed**			
Description:		listing of data replayed through orb			
field name	no.	type	print format	character positions	attribute description
sta	1	string	%-6s	1-6	station
chan	2	string	%-8s	8-15	channel
time	3	time	%17.5f	17-33	epoch time
endtime	4	time	%17.5f	35-51	last valid time for data
orb	5	string	%50s	53-102	orbserver used
lddate	6	time	%17.5f	104-120	(epoch) time of last record modification

Relation:	**retransmit**			
Description:	packets which arrived out of time order			
field name	no.	type	print format	character positions	attribute description
tagname	1	string	%-8s	1-8	key (arid, orid, evid, etc.)
sta	2	string	%-6s	10-15	station
chan	3	string	%-8s	17-24	channel
time	4	time	%17.5f	26-42	epoch time
pktid	5	integer	%10d	44-53	orb ring buffer packet id
dup_pktid	6	integer	%10d	55-64	orb ring buffer packet id
stray	7	string	%-1s	66-66	duplicate, overlap, normal or rejected packet
lddate	8	time	%17.5f	68-84	(epoch) time of last record modification

Relation:	**rrdcache**			
Description:	Cache of Round-Robin Database files			
field name	no.	type	print format	character positions	attribute description
net	1	string	%-8s	1-8	unique network identifier
sta	2	string	%-6s	10-15	station
chan	3	string	%-8s	17-24	channel
rrdvar	4	string		26-55	Round-Robin Database variable
time	5	time	%17.5f	57-73	epoch time
endtime	6	time	%17.5f	75-91	last valid time for data
dir	7	string	%-64s	93-156	directory
dfile	8	string	%-32s	158-189	data file
lddate	9	time	%17.5f	191-207	(epoch) time of last record modification

Relation:	**rrdgraph**			
Description:	Graphs of Round-Robin Database values			
field name	no.	type	print format	character positions	attribute description
net	1	string	%-8s	1-8	unique network identifier
sta	2	string	%-6s	10-15	station
rrdvar	3	string		17-46	Round-Robin Database variable
rrdgraphname	4	string		48-77	Round-Robin Database graph name
time	5	time	%17.5f	79-95	epoch time
endtime	6	time	%17.5f	97-113	last valid time for data
dir	7	string	%-64s	115-178	directory
dfile	8	string	%-32s	180-211	data file
lddate	9	time	%17.5f	213-229	(epoch) time of last record modification

Relation:	**seismometer**				
Description:	seismometer/calibration coil parameters				
field name	no.	type	print format	character positions	attribute description
net	1	string	%-8s	1-8	unique network identifier
sta	2	string	%-6s	10-15	station
chan	3	string	%-8s	17-24	channel
time	4	time	%17.5f	26-42	epoch time
endtime	5	time	%17.5f	44-60	last valid time for data
model	6	string	%-15	62-76	Model
manu	7	string	%-15	78-92	Manufacturer
ssident	8	string	%-16s	94-109	identifier (sensor ser no/sw revision)
sensortype	9	string	%-4	111-114	Measured quantity from a sensor
caldrive	10	string	%-1s	116-116	Calibration drive type
active	11	string	%-3	118-120	active/passive flag
calgen	12	real	%15.7e	122-136	Calibration to ground constant
cal2rsp	13	integer	%3d	138-140	Calibrator response to ground response function
samprate	14	real	%11.7f	142-152	sampling rate in samples/sec
calib	15	real	%16.9g	154-169	nominal calibration
calper	16	real	%16.6f	171-186	nominal calibration period
rsptype	17	string	%-6s	188-193	response type
lddate	18	time	%17.5f	195-211	(epoch) time of last record modification

Relation:		**sensorcal**			
Description:		results of a sensor calibration			
field name	no.	type	print format	character positions	attribute description
sta	1	string	%-6s	1-6	station
chan	2	string	%-8s	8-15	channel
tstart	3	time	%17.5f	17-33	processing start time
tend	4	time	%17.5f	35-51	processing end time
time	5	time	%17.5f	53-69	epoch time
endtime	6	time	%17.5f	71-87	last valid time for data
dlcalseq	7	string	%-30	89-118	Calibration sequence identifier
dlcaltype	8	string	%-16s	120-135	Calibration type
runtime	9	time	%17.5lf	137-153	processing run time
auth	10	string	%-15s	155-169	source/originator
hostname	11	string	%-25	171-195	computer host name
dlcalref	12	string	%-3s	197-199	Calibration reference switch
dlmodel	13	string	%-15	201-215	Datalogger model
dlident	14	string	%-16s	217-232	Datalogger identifier (serial number)
snmodel	15	string	%-15	234-248	Sensor model
snident	16	string	%-16s	250-265	Sensor identifier (serial number)
samprate	17	real	%11.7f	267-277	sampling rate in samples/sec
sngen	18	real	%10.5g	279-288	sensor generator gain
calper	19	real	%16.6f	290-305	nominal calibration period
rsptype	20	string	%-6s	307-312	response type
sngenerr	21	real	%10.3f	314-323	sensor generator gain error
sngcmp	22	string	%-3s	325-327	sngen comparison disposition
rspcmp	23	string	%-3s	329-331	response comparison disposition
dir	24	string	%-64s	333-396	directory
dfile	25	string	%-32s	398-429	data file
dfilee	26	string	%-32s	431-462	error data file
lddate	27	time	%17.5f	464-480	(epoch) time of last record modification

Relation:		**sensormodel**			
Description:		nominal model seismometer/calibration coil parameters			
field name	no.	type	print format	character positions	attribute description
snmodel	1	string	%-15	1-15	Sensor model
sensortype	2	string	%-4	17-20	Measured quantity from a sensor
caldrive	3	string	%-1s	22-22	Calibration drive type
active	4	string	%-3	24-26	active/passive flag
calgen	5	real	%15.7e	28-42	Calibration to ground constant
cal2rsp	6	integer	%3d	44-46	Calibrator response to ground response function
sngen	7	real	%10.5g	48-57	sensor generator gain
calper	8	real	%16.6f	59-74	nominal calibration period
dir	9	string	%-64s	76-139	directory
dfile	10	string	%-32s	141-172	data file
lddate	11	time	%17.5f	174-190	(epoch) time of last record modification

Relation:		**sitephotos**			
Description:		photos of seismic sites			
field name	no.	type	print format	character positions	attribute description
sta	1	string	%-6s	1-6	station
time	2	time	%17.5f	8-24	epoch time
siteimagetype	3	string	%-20s	26-45	type of site image
imagename	4	string	%-64s	47-110	name of image
imagesize	5	string	%-25s	112-136	size of an image
imagedescrip	6	string	%-64s	138-201	image description
format	7	string	%-10s	203-212	graphics format for image
dir	8	string	%-64s	214-277	directory
dfile	9	string	%-32s	279-310	data file
auth	10	string	%-15s	312-326	source/originator
lddate	11	time	%17.5f	328-344	(epoch) time of last record modification

Relation:		**stanotes**			
Description:		notes about station status			
field name	no.	type	print format	character positions	attribute description
sta	1	string	%-6s	1-6	station
time	2	time	%17.5f	8-24	epoch time
endtime	3	time	%17.5f	26-42	last valid time for data
auth	4	string	%-15s	44-58	source/originator
format	5	string	%-10s	60-69	graphics format for image
dir	6	string	%-64s	71-134	directory
dfile	7	string	%-32s	136-167	data file
lddate	8	time	%17.5f	169-185	(epoch) time of last record modification

Relation:		**trigger**			
Description:		Event trigger times			
field name	no.	type	print format	character positions	attribute description
time0	1	time	%17.5f	1-17	initial time value
tagname	2	string	%-8s	19-26	key (arid, orid, evid, etc.)
sta	3	string	%-6s	28-33	station
chan	4	string	%-8s	35-42	channel
time	5	time	%17.5f	44-60	epoch time
state	6	string	%-3s	62-64	detector state
filter	7	string	%-30s	66-95	filter description
lddate	8	time	%17.5f	97-113	(epoch) time of last record modification

Relation:	**wfdisc_tshift**			
Description:	wfdisc time corrected			
field name	no.	type	print format	character positions	attribute description
wfid	1	integer	%8d	1-8	waveform id
time	2	time	%17.5f	10-26	epoch time
original_time	3	time	%17.5f	28-44	time correction
endtime	4	time	%17.5f	46-62	last valid time for data
original_endtime	5	time	%17.5f	64-80	time correction of data processing time
original_samprate	6	real	%11.7f	82-92	sampling rate in samples/sec
straddle	7	string	%-1s	94-94	does wfdisc correction straddle a time shift?
lddate	8	time	%17.5f	96-112	(epoch) time of last record modification

Relation:	**wfmgme**				
Description:	bundled waveform measurements for ground motion estimates				
field name	no.	type	print format	character positions	attribute description
sta	1	string	%-6s	1-6	station
filter	2	string	%-30s	8-37	filter description
time	3	time	%17.5f	39-55	epoch time
pva	4	real	%13.6e	57-69	peak vector acceleration
trpva	5	real	%12.5f	71-82	relative time for pva measurement
snrpva	6	real	%10.2lf	84-93	signal to noise ratio for pva measurement
pvv	7	real	%13.6e	95-107	peak vector velocity
trpvv	8	real	%12.5f	109-120	relative time for pvv measurement
snrpvv	9	real	%10.2lf	122-131	signal to noise ratio for pvv measurement
wa	10	real	%13.6e	133-145	peak Wood-Anderson drum recorder displacement
trwa	11	real	%12.5f	147-158	relative time for wa measurement
snrwa	12	real	%10.2lf	160-169	signal to noise ratio for wa measurement
chanwa	13	string	%-8s	171-178	channel for wa measurement
lddate	14	time	%17.5f	180-196	(epoch) time of last record modification

Relation:	**wfoffset**				
Description:	abscissa offset values for wfdisc time-series				
field name	no.	type	print format	character positions	attribute description
sta	1	string	%-6s	1-6	station
chan	2	string	%-8s	8-15	channel
time	3	time	%17.5f	17-33	epoch time
endtime	4	time	%17.5f	35-51	last valid time for data
valoffset	5	real	%20.12g	53-72	amount by which wfdisc traces are offset
lddate	6	time	%17.5f	74-90	(epoch) time of last record modification

Relation:		**wfsrb**			
Description:		SRB archived waveform file header and descriptive information			
field name	no.	type	print format	character positions	attribute description
sta	1	string	%-6s	1-6	station
chan	2	string	%-8s	8-15	channel
time	3	time	%17.5f	17-33	epoch time
wfid	4	integer	%8d	35-42	waveform id
chanid	5	integer	%8d	44-51	channel operation id
jdate	6	yearday	%8d	53-60	julian date
endtime	7	time	%17.5f	62-78	last valid time for data
nsamp	8	integer	%8d	80-87	number of samples
samprate	9	real	%11.7f	89-99	sampling rate in samples/sec
calib	10	real	%16.9g	101-116	nominal calibration
calper	11	real	%16.6f	118-133	nominal calibration period
instype	12	string	%-6s	135-140	instrument code
segtype	13	string	%-1s	142-142	detector measurement type / natural units
datatype	14	string	%-2s	144-145	numeric storage
clip	15	string	%-1s	147-147	clipped flag
Szone	16	string	%-30s	149-178	SRB Zone
Scoll	17	string	%-256s	180-435	SRB Collection
Sobj	18	string	%-64s	437-500	SRB Object
foff	19	integer	%10d	502-511	byte offset
commid	20	integer	%8d	513-520	comment id
lddate	21	time	%17.5f	522-538	(epoch) time of last record modification

DATABASE RELATIONS

This chapter describes the relations of a schema. The information given here, along with that in Chapter 4, *Database Attributes*, constitutes the data dictionary. There is an entry for each relation. Within the entry, the relation's name appears first, followed by a list of its key attributes. A brief description completes the entry. Key attributes link relations. The following tableau explains the format used in the entries.

–

Name: This is the name of the relation.

Keys: Primary. These are the attributes which, taken together, uniquely identify a row in the table.
Alternate. These are other attributes which also uniquely identify a row and may be used as primary keys.
Foreign. These attributes are primary keys in another table.

Description: This paragraph describes the relation.

–

Keys provide the links by which tables are joined. The following definitions explain the several types of keys.

A primary key (which often is the concatenation of several attributes) uniquely identifies a row in the table. For example, each **origin** record is unique by *lat, lon, depth*, and *time*.

An alternate key also uniquely identifies a row in the table and may be used as the primary key. For example, *orid* may also be used as the primary key for the **origin** table.

A foreign key is another table's primary key. Thus, *evid* is a foreign key in the **origin** table, but is the primary key in the **event** table. Similarly, *commid* is a foreign key in many of the tables and the primary key in **remark**.

Name: **achanaux**

Keys: Primary: sta fchan aux
Alternate: sta chan

Description: SEED and autoDRM use loc or aux to further specify channel, but the css3.0 schema doesn't support loc as a key. This table maps autodrm chan+aux codes to

a unique local channel code, using the corresponding local sta name. Note the combination of the local sta name with the foreign chan and aux codes.

–

Name: **affiliation**

Keys: Primary: sta net

Description: This is an intermediate relation by which seismic stations may be clustered into networks.

–

Name: **anetsta**

Keys: Primary: anet fsta
Alternate: sta

Description: SEED and autoDRM use network to further specify station, but the css3.0 schema doesn't support net as a key whereever sta is used. This table maps foreign autodrm net+sta codes to a unique local station code.

–

Name: **arrival**

Keys: Primary: sta time
Alternate: arid
Foreign: stassid chanid commid

Description: Information characterizing a 'seismic phase' observed at a particular station is saved here. Many of the attributes conform to seismological convention and are listed in earthquake catalogs.

–

Name: **assoc**

Keys: Primary: arid orid
Foreign: arid orid commid

Description: This table has information that connects arrivals (i.e., entries in the arrival relation) to a particular origin. It has a composite key made of arid and orid. There are two kinds of measurement data: three attributes are related to the station (delta, seaz, esaz), and the remaining measurement attributes are jointly determined by the measurements made on the seismic wave (arrival), and the inferred event's origin (origin). The attribute sta is intentionally duplicated in this table to eliminate the need for a join with arrival when doing a lookup on station.

–

Name: **beam**

Keys: Primary: wfid

Description: Information characterizing an individual time-domain beam. The beam waveform is referenced through an associated entry in the wfdisc table.

–

Name: **calibration**

Keys: Primary: sta chan time::endtime

Description: This table provides a record of updates in the calibration of a station-channel for a specific time interval are provided here. There is one entry for each calibration period. Calib, calper, and units are given for the complete system response.

–

Name: **centryd**

Keys: Primary: orid
Foreign: commid

Description: This table is designed to accommodate the centroid information in the form described in detail in "Determination of Earthquake Source Parameters for Studies of Global and Regional Seismicity", A.M. Dziewonski, T.A. Chou, and J.H. Woodhouse, J.Geophys.Res., 86, 2825-2852. 1981.

–

Name: **emodel**

Keys: Primary: orid
Foreign: orid

Description: This relation holds velocity model error bound estimates computed by genloc using theory from Pavlis (1986).

–

Name: **event**

Keys: Primary: evid
Foreign: commid

Description: The purpose of this relation is to allow the connection of multiple origins to one event. Prefor points to the preferred origin.

–

Name: **fkgrid**

Keys: Primary: sta chan filter time::endtime

Description: This information characterizes a single F-K grid (east-west north-south slowness grid) computed from seismic array data. The grid nodes are composed of normalized beam power values that are averaged over a time window (twin). The actual grid values can be optionally stored as external files. If nt is greater than one, then the grid is composed by stacking nt grids together.

–

Name: **fplane**

Keys: Primary: mechid
Foreign: orid

Description: This table stored double couple focal mechanism plane data. It is a minor variant of a table of the same name used in css2.8.

–

Name: **gregion**

Keys: Primary: grn

Description: This static relation contains geographic region numbers and their equivalent English representation. (See Flinn et al., BSSA, v64, p2, July, 1974.)

–

Name: **instrument**

Keys: Primary: inid
Alternate: insname instype band digital samprate rsptype ncalib ncalper dir dfile

Description: This table serves three purposes. It holds nominal one-frequency calibration factors for each instrument. It holds pointers to the nominal frequency-dependent calibration for an instrument. Finally, it holds pointers to the exact calibrations obtained by direct measurement on a particular instrument. See sensor.

–

Name: **lastid**

Keys: Primary: keyname

Description: This relation is a reference table from which programs may retrieve the last sequential value of one of the numeric keys. Id keys are required before inserting a record in numerous tables. The table has exactly one row for each keyname. In the core schema there are just 9 distinct identifier keys: arid, chanid, commid, evid, inid, magid, orid, stassid, wfid. This table will also support application-specific keys, provided they are defined by some table. Users are encouraged to use the dbnextid library routine or command to obtain a unique counter value.

–

Name: **moment**

Keys: Primary: orid
Foreign: commid

Description: This table is designed to accommodate the tensor information in the form described in detail in "Determination of Earthquake Source Parameters for Studies of Global and Regional Seismicity", A.M. Dziewonski, T.A. Chou, and J.H. Woodhouse, J.Geophys.Res., 86, 2825-2852. 1981.

–

Name: **netmag**

Keys: Primary: magid
Foreign: orid evid net commid

Description: This table summarizes estimates of network magnitudes of different types for an event. Each network magnitude has a unique magid. Station magnitudes used to compute the network magnitude are in the relation stamag.

–

Name: **network**

Keys: Primary: net
Foreign: commid

Description: This relation gives general information about seismic networks. See affiliation.

–

Name: **origerr**

Keys: Primary: orid
Foreign: commid

Description: The error estimates associated with the parameters in the origin relation are saved in this table. The measurement attributes are the elements of the location covariance matrix. The descriptive attributes, which are more meaningful, describe the uncertainities in location, depth and origin time. These quantities are calculated from the covariance matrix, assuming gaussian errors and a confidence level conf.

–

Name: **origin**

Keys: Primary: time lat lon depth
Alternate: orid
Foreign: evid commid grn srn

Description: Information describing a derived or reported origin for a particular event is stored in this table.

–

Name: **predarr**

Keys: Primary: arid orid
Foreign: arid orid

Description: This table has information that connects arrival rows to predicted values of related observable based on a particular earth model. It is keyed similar to assoc, but the attributes in this relation are all predicted values based on some earth model. This relations can be thought of as a supplement to assoc that directly stores predicted values of observables rather than residuals. Note that esaz and dip are azimuth and dip of the predicted emergence angle of a given arrival in the focal sphere. esaz is not necessarily the same as that stored in assoc which is conventionally the great circle path angle. Similarly seaz and ema are computed from a model, not from simple spherical geometry.

–

Name: **predmech**

Keys: Primary: arid orid mechid
Foreign: arid orid mechid

Description: This table is used to show predicted first motions based on a particular focal mechanism. It is assumed the earth model used is the same as that used to produce orid so the the angles defined in predarr can be used to show inconsistencies between actual and predicted first motions.

–

Name: **remark**

Keys: Primary: commid lineno

Description: This single line of text is an arbitrary comment about a record in the database. The comment is linked to its parent relation only by forward reference from commid in the tuple of the relation of interest. See commid and lineno.

–

Name: **schanloc**

Keys: Primary: sta chan
Alternate: sta fchan loc

Description: SEED and autoDRM use loc or aux to further specify channel, but the css3.0 schema doesn't support loc as a key. This table maps seed chan+loc codes to a unique local channel code, using the corresponding local sta name. Note the combination of the local sta name with the foreign chan and loc codes.

–

Name: **sensor**

Keys: Primary: sta chan time::endtime
Foreign: inid chanid

Description: This table provides a record of updates in the calibration factor or clock error of each instrument, and links a sta/chan/time to a complete instrument response in the relation instrument.

–

Name: **site**

Keys: Primary: sta ondate::offdate

Description: Site names and describes a point on the earth where seismic measurements are made (e.g. the location of a seismic instrument or array). It contains information that normally changes infrequently, such as location. In addition, site contains fields to describe the offset of a station relative to an array reference location. Global data integrity implies that the sta/ondate in site be consistent with the sta/chan/ondate in sitechan.

–

Name: **sitechan**

Keys: Primary: chanid
Alternate: sta chan ondate::offdate

Description: This relation describes the orientation of a recording channel at the site referenced by sta. This relation provides information about the various channels (e.g. sz, lz, iz) that are available at a station and maintains a record of the physical channel configuration at a site.

–

Name: **snetsta**

Keys: Primary: sta
Alternate: snet fsta

Description: SEED and autoDRM use network to further specify station, but the css3.0 schema doesn't support net as a key whereever sta is used. This table maps foreign seed net+sta codes to a unique local station code.

–

Name: **specdisc**

Keys: Primary: sta chan time twin spectype rsptype

Description: this relation provides a pointer (or index) to spectral files stored on disk. This would normally be expected to be trace like data stored as binary floats. Technically though this relation allows integer binary formats. Current code ignores this attribute.

–

Name: **sregion**

Keys: Primary: srn

Description: This is a static relation containing seismic region numbers and their equivalent English names. (See Flinn et al., BSSA, v64, p2, July, 1974.)

–

Name: **stage**

Keys: Primary: sta chan stageid time::endtime

Description: Information characterizing an individual stage of the total calibration of a station-channel. Stageid provides the specific ordering in the system response for the stage. gnom, gcalib, and gunits are given for the stage. Combining all records having the same sta-chan-time will provide calib in the calibration table. This table can describe analog or digital stages. Each record provides pointers to files which contain the actual poles/zeros or digital filter coefficients.

–

Name: **stamag**

Keys: Primary: magid magtype sta orid
Foreign: arid magid orid evid commid

Description: This table summarizes station magnitude estimates based upon measurements made on specific seismic phases, with a specified distance (computed from the origin). See netmag.

–

Name: **stassoc**

Keys: Primary: stassid
Foreign: commid

Description: This table defines the group of phases seen at a single station from the same event.

–

Name: **stgrid**

Keys: Primary: sta chan filter azimuth time::endtime

Description: This information characterizes a single Slowness-Time grid computed from seismic array data. A Slowness-Time grid is computed for a fixed azimuth. The grid nodes are composed of normalized beam power values that are averaged over a time window (twin). The actual grid values can be optionally stored as external files.

–

Name: **wfdisc**

Keys: Primary: sta chan time::endtime
Alternate: wfid
Foreign: commid chanid

Description: This relation provides a pointer (or index) to waveforms stored on disk. The waveforms themselves are stored in ordinary disk files called wfdisc or.w files, containing only a sequence of sample values (usually in binary representation).

–

Name: **wfedit**

Keys: Primary: sta chan time::endtime
Alternate: edid
Foreign: commid

Description: Specifies a time slice for which a specified waveform has a problem, identified by the probtype field.

–

Name: **wfmeas**

Keys: Primary: sta chan meastype filter time endtime
Foreign: arid

Description: This relation provides a general way to store measurements made on segments of waveform data. The time::endtime fields give the time window of the data for which the measurement is unique. tmeas and twin specify the beginning of the measurement time for discrete measurements, and the time-span for extended measurements. The contents of val1 and val2, described by units1 and units2, depend on the type of measurement made.

–

Name: **wfrms**

Keys: Primary: sta chan time twin filter
Foreign: arid

Description: This relation provides a holder for waveform root-mean-square values. These values can be used to form signal to noise estimates or raw signal (or noise) estimates.

–

Name: **wftag**

Keys: Primary: tagname tagid wfid
Foreign: wfid

Description: The wftag relation links various identifiers, e.g. origin id, arrival id, stassoc id, to waveform id. All of the linkages could be determined indirectly using sta, chan and time. However, it is more efficient to predetermine them.

–

Name: **wftape**

Keys: Primary: sta chan time::endtime
Alternate: wfid
Foreign: chanid commid

Description: This relation provides a pointer or index to waveforms that have been archived on official Center archive tapes. This is a companion relation to wfdisc.

–

Name: **wftar**

Keys: Primary: sta chan time::endtime
Foreign: commid

Description: This relation provides a pointer (or index) to waveforms stored on tape as tar files as well as their destination on disk.

–

Name: **alarmcomm**

Keys: Primary: time recipient
Foreign: alarmid

Description: This table tracks attempts to notify staff members about alarm conditions in the network. The time field in this table indicates the system-clock timestamp at which a particular message was sent to the specified recipient (note that this could be different from the time at which the alarm was declared, i.e.

alarms.time, and also different from the time of the earth event of interest, e.g. origin.time).

–

Name: **alarms**

Keys: Primary: alarmkey alarmclass alarmname
Alternate: alarmid
Foreign: evid orid

Description: The alarms table tracks discrete-time events for which the automated system needs to notify human staff and/or transfer control to human staff. The time

field in the alarms table indicates the system-clock timestamp at which the alarm was declared (note that this could be different than the time of interest for the earth event, for example the hypocenter origin time, and could also be

different from the time at which a notification message was sent, if there are delays specified for each calldown recipient).

–

Name: **arrival_tshift**

Keys: Primary: arid

Description: This table records time corrections which have been applied to the arrival table.

–

Name: **b051**

Keys: Primary: sta seed_comment time::endtime

Description: Include any data outages and time corrections in the station comments.

–

Name: **b059**

Keys: Primary: sta chan seed_comment time::endtime

Description: none

–

Name: **balerlist**

Keys: Primary: dlname time

Description: Table designed provide documentation on the process to acquire information about the status and contents of the Quanterra Baler 14.

–

Name: **calresult**

Keys: Primary: net sta chan caltype runtime time::endtime

Description: This relation contains the analysis results of a random binary calibration.

–

Name: **calwf**

Keys: Primary: net sta chan time::endtime

Description: This relation marks waveform segments that were produced by exciting the sensor calibration coil with various calibration signals. The actual calibration function signal starts at time and ends at endtime. For sine wave calibration functions, the zero phase point is at time. For step/impulse/free period calibrations, the calibration step function starts at time and goes off at endtime. For impulse/free period calibrations, endtime-time is normally small and the calibration analysis window would include both time and endtime. For a step function, endtime-time is normally large and the calibration analysis window would include only the onset at time.

–

Name: **changed**

Keys: Primary: sta chan time param

Description: When one of the parameters calib, samprate, or the tick registration changes, a record is saved to this table.

–

Name: **chanperf**

Keys: Primary: sta chan time endtime

Description: percentage of data returned over specified time range

–

Name: **comm**

Keys: Primary: sta time::endtime

Description: Table designed to handle more detail in station communications including:

commtype: string field that would allow specifications like VSAT, CDMA, regular_internet, DSL, etc.

provider: string field allowing specifications like: Hughes, Verizon, SBC, etc.

ip: will need to accommodate dhcp mapped names, so more than just 15 characters.

–

Name: **deployment**

Keys: Primary: sta time::endtime

Description: Table designed to handle more detail in station operations including:

time and endtime data are expected from station equipment installation and removal certification and decertification times for station quality

–

Name: **detection**

Keys: Primary: time sta chan filter state

Description: This relation holds changes in detector state (either "on" or "off") for a given frequency band as specified by "filter".

–

Name: **detev**

Keys: Primary: sta chan filter time

Description: This relation holds the complete set of detector state changes for a given frequency band as specified by "filter". This can be thought of as a combination of the "on", "<phase>", "off" rows from the detection relation for a single detection event.

–

Name: **digitizer**

Keys: Primary: net sta chan time::endtime
Foreign: ssident

Description: This relation holds basic digitizer and calibrator parameters.

–

Name: **dlacq**

Keys: Primary: model ssident time::endtime

Description: This relation is meant to hold parameter information relating to the acquisition of data from dataloggers in the field.

–

Name: **dlcalwf**

Keys: Primary: snet fsta fchan loc time::endtime
Foreign: ssident

Description: This relation references datalogger calibration waveforms. Calibration waveforms can either be produced directly from the sensors or in a loopback mode where the calibration signal DAC is connected directly to the ADC.

–

Name: **dlchannel**

Keys: Primary: snet fsta fchan loc time::endtime
Foreign: ssident

Description: This relation holds the mapping between the SEED net-sta-chan-loc codes (snet-fsta-fchan-loc) for a channel of data and the particular datalogger and the physical channel and stream number where it was acquired.

–

Name: **dlevent**

Keys: Primary: dlname dlevtype time

Description: This table collects the user or equipment interations with the datalogger. These interactions could include: service visits, massrecenters, calibration, sensor locks/unlocks, baler turn-on, etc.

–

Name: **dlsensor**

Keys: Primary: dlmodel dlident chident time::endtime

Description: This relation holds the mapping between dataloggers and sensors that is independent of network-station-channel names.

–

Name: **dlsite**

Keys: Primary: model ssident time::endtime

Description: This relation is meant to hold semi-static information relating to dataloggers in the field including their dlname associations, location (lat, lon, elev) and communications types and providers.

–

Name: **dmcseed**

Keys: Primary: dfile

Description: This relation information about seed files prepared for the IRIS DMC.

–

Name: **dmcwf**

Keys: Primary: sta chan time::endtime
Foreign: dfile

Description: This relation provides a pointer (or index) to waveforms stored in file named seedname. This is a processing table for preparing seed data to deliver to the IRIS DMC.

–

Name: **eids**

Keys: Primary: orid time
Foreign: orid

Description: The eids table tracks XML files containing information on earthquakes for the Earthquake Information Distribution System (EIDS) of the U.S. Geological Survey.

–

Name: **gap**

Keys: Primary: sta chan time

Description: Data was lost for some reason and was not saved to the database.

–

Name: **gps**

Keys: Primary: net sta time lat lon elev

Description: location of station based on gps clock connected to datalogger.

–

Name: **gsnspec**

Keys: Primary: sta chan period time::endtime

Description: The gsnspec relation stores 1, 5, 25, 50 percentile spectral levels for GSN stations as calculated by Berger, Davis, and Ekstrom (2004) Ambient Earth Noise: A survey of the Global Seismic Network JGR Vol 109, B11307, doi:10.1029/2004JB003408

–

Name: **iptable**

Keys: Primary: id

Description: Some programs can lookup the dynamic ip address for a station in this table.

–

Name: **latency**

Keys: Primary: sta chan time period

Description: latency derived from the difference between packet time and local clock time.

–

Name: **netperf**

Keys: Primary: snet time endtime

Description: percentage of data returned over time range

–

Name: **nominalresp**

Keys: Primary: net sta chan time::endtime

Description: This relation holds basic seismometer and digitizer overall nominal response parameters.

–

Name: **q330comm**

Keys: Primary: ssident time::endtime

Description:

–

Name: **q730b**

Keys: Primary: ssident time::endtime

Description: This relation contains the parameters relating to a Q730B digitizer

–

Name: **qgrid**

Keys: Primary: qgridname recipe time::endtime
Foreign: orid

Description: The qgrid relation stores references to external grid files, which in turn contain information about ground motion for a given time period and area. These grids are intended to be georeferenced and plottable. They may or may not be associated with a particular earthquake. The chosen measure of ground motion is left arbitrary, indicated by the recipe name which corresponds to a dbgme recipe, although the units field is provided for recording the units of the grid Z-values, if applicable. The current schema is limited to regularly

spaced, rectangular grids. Unknown values may be represented by IEEE Quiet NaN.

–

Name: **ratechange**

Keys: Primary: sta chan time

Description: When the observed sample rate wanders outside limits, a record is saved to this table.

–

Name: **replayed**

Keys: Primary: sta chan time::endtime

Description: The replayed table is designed to track what waveform data are send to a replay orb.

–

Name: **retransmit**

Keys: Primary: sta chan time pktid

Description: A packet which arrives out of time order is typically a retransmitted packet.

–

Name: **rrdcache**

Keys: Primary: net sta rrdvar time::endtime
Alternate: dir dfile
Foreign: chan

Description: This table maintains a list of round-robin-database (RRD) files for a given set of database parameters.

–

Name: **rrdgraph**

Keys: Primary: net sta rrdvar rrdgraphname
Alternate: dir dfile

Description: This table maintains a collection of pre-generated graphs of values from a round-robin-database (RRD).

–

Name: **seismometer**

Keys: Primary: net sta chan time::endtime

Description: This relation holds basic seismometer and calibration coil parameters that are needed for computing overall sensor sensitivity from calibration signals.

–

Name: **sensorcal**

Keys: Primary: sta chan dlcaltype runtime tstart::tend

Description: This relation contains the analysis results of a sensor calibration.

–

Name: **sensormodel**

Keys: Primary: snmodel

Description: This relation holds basic seismometer and calibration coil parameters that are needed for computing overall sensor sensitivity from calibration signals. This is the same os seismometer except that it is model dependent and should be used to contain nominal default parameters for a particular model of sensor.

–

Name: **sitephotos**

Keys: Primary: sta time imagename imagesize

Description: The sitephotos relation stores pictures of seismic site installations. Any photo or set of photos associated with a site may be stored, however most commonly these will be pictures of the sensor itself, pictures of the vault, pictures of the surroundings, and perhaps pictures of the installation crew or anything else deemed appropriate.

–

Name: **stanotes**

Keys: Primary: sta lddate time::endtime

Description: Primarily intended to supplement the gaps report with some description of what might be happening.

–

Name: **trigger**

Keys: Primary: time0 sta chan state filter

Description: This relation holds time values corresponding to event trigger times (time0) and individual station-channel trigger times (time) that can be used to guide arrival picking.

–

Name: **wfdisc_tshift**

Keys: Primary: wfid

Description: This table records time corrections which have been applied to the wfdisc table.

–

Name: **wfmgme**

Keys: Primary: sta filter time

Description: This relation contains a set of waveform measurements that can be used to make ground motion estimates.

–

Name: **wfoffset**

Keys: Primary: sta chan time endtime

Description: Sometimes it is convenient to store wfdisc time-series with a constant offset removed, especially in the case of high-precision data where the full-scale

values do not fit well into the storage format chosen for the traces. This table stores the constant offset which must be added to the calibrated time-series values in order to recover the true absolute values.

–

Name: **wfsrb**

Keys: Primary: sta chan time::endtime
Foreign: chanid commid

Description: This relation provides a pointer (or index) to waveforms stored in a Storage Resource Broker (SRB) as SRB objects, as well as their locations in SRB collections and the zone identifier of the SRB in question.

–

DATABASE ATTRIBUTES

This chapter describes each of the attributes used in the schema. Descriptions of the relations are found in Chapter 3, *Database Relations*. Attributes are presented as follows:

–

Name: *This is the name of the attribute.*

Relation: **These are the database relations which contain the attribute.**

Description: This paragraph describes the attribute.

NA Value: This is a value used to indicate that information is not available for this attribute. Many attributes in this schema are optional. The NULL value is defined for these attributes and should be used when the actual value is not known. Essential attributes must always be given a value.

Units: This lists the unit of measurement for the attribute, if applicable.

Range: This is the range of permissible or recommended values for this attribute, if such a range exists. For most strings, the range indicates the recommended values, but is not restricted to those values.

–

The following conventions are applied throughout.

Dates and Times

The *time* attribute throughout the database is stored as epochal time, the number of seconds since January 1, 1970. Epochal time has a precision of 1 millisecond. Often *time* is matched by the more readable attribute, *jdate*. This so called "Julian date" represents a day in the form, for example, 1981231 where 1981 is the year (YYYY) and 231 is the day of year (DOY).

Units of Measurement

Attribute descriptions also include the unit of measurement, if applicable. Here are some quantities with their corresponding measurement units:

period, time	seconds	*calper*, *time*, *endtime*, etc.
julian date	YYYYDOY	*jdate*
amplitude	nanometers	Note that long-period measurements are frequently reported in microns so conversion is required.
angular measurements	degrees	*delta*, *azimuth*, etc.
depth, errors in location	kilometers	*deast*, *depdp*, *depth*, etc.

Range

Whenever possible, explicit ranges are defined for each attribute. The specified ranges are in the form of expressions which can be evaluated by the db library routines, to simplify automated validity checks of databases.

The style of these expressions closely follows standard c syntax, with an extension similar to awk, perl or the shell for regular expression matches. Typically, a numerical attribute may have an expression like:

lat >= -90. && lat <= 90.

which means that lat must fall between -90 degrees and +90 degrees.

Some character attributes are can take on only a few legal values. The enumeration of these values is written like:

clip =~ /c|n/

which means that clip may either be "c" or "n". (The NULL value is a third possibility, in this case.)

Sometimes no information is available for an attribute. In that case, a NULL value is assigned. A NULL value is outside the range of permissible or recommended values for the attribute. This special NULL value alerts users and applications that the desired attribute was not available when the record was created. For example, in the **origin** relation, the attribute *ms*, surface wave magnitude, may be unknown for a given record, since it often can't be measured. Then the NULL value for magnitudes (–999.0) should be assigned to *ms* and *msid* should be set to –1, the NULL value for *msid*. Some attributes are essential to defining a meaningful record and they must be specified; the NULL value is not allowed. For example, the attribute *time* in **arrival** must be given a value in the valid range, not an NULL value.

Some general guidelines and specific examples of NULL values are given in the following table.

Representative NULL Values:

character fields	- (a dash)
non-negative integer numbers	–1
non-negative real numbers	–1.0
negative real numbers	–999.0
conf	0.0
deast, dnorth	0.0
endtime	+9999999999.999
time	–9999999999.999

In Versions 2.7 and 2.8 of the schema, the underscore "_" was used to denote an unavailable character string. Since the underscore "_" represents the ANSI SQL "match any single character" wildcard, Version 3.0 uses the dash "-" to denote an unknown character string.

Format of Character Data

Most character fields are mixed case, but *sta* and *chan* are normally uppercase only.

Name: *Scoll*

Relation: **wfsrb**

Description: The Scoll field identifies the Collection to which a given file belongs in a Storage Resource Broker (SRB). The SRB Collection name is analogous to a directory name on a Unix file system.

NULL value: -

–

Name: *Sobj*

Relation: **wfsrb**

Description: The Sobj field identifies the object name under which a given file is registered in a Storage Resource Broker (SRB). The SRB Object name is analogous to a file name on a Unix file system.

NULL value: -

–

Name: *Szone*

Relation: **wfsrb**

Description: The Szone field identifies the relevant Storage Resource Broker (SRB) system containing the referenced file. The exact hostname and port needed to connect to this SRB may be found from the Zone Authority. At the time of writing that zone authority is at

http://www.npaci.edu/dice/srb/zoneAuthority.html

NULL value: -

–

Name: *ackauth*

Relation: **alarms**

Description: This field records who acknowledged an alarm. This may be a name, username, email address, or similar appropriate string.

NULL value: -

–

Name: *acknowledged*

Relation: **alarms**

Description: This field records whether an alarm has been acknowledged.

NULL value: -

Range: acknowledged =~ /y|n/

–

Name: *acktime*

Relation: **alarms**

Description: This field records when an alarm has been acknowledged.

NULL value: -9999999999.99900

Units: Seconds

–

Name: *acqmode*

Relation: **dlacq**

Description: This is a string meant to represent a particular operating mode for datalogger acquisition, aka an acquisition disposition name.

NULL value: -

–

Name: *acqparams*

Relation: **dlacq**

Description: This is a string meant to represent a set of datalogger acquisition parameters, aka an acquisition template name.

NULL value: -

–

Name: *active*

Relation: **seismometer sensormodel**

Description: This string identifies if a sensor is active (yes) or passive (no)

NULL value:

–

Name: *address*

Relation: **iptable**

Description: ip address (and optionally port number) for a station with DHCP. The port number is specified in the standard manner, following a colon ':' after the ip address.

NULL value: -

–

Name: *alarmclass*

Relation: **alarms**

Description: This field gives a standardized class for each type of alarm, for example "hypocenter" for automatic earthquake locations or "accel" for raw strong-motion acceleration exceedences. Generally there will be a direct correspondence between the alarmclass and the incoming packet types which are

analyzed to produce the alarms, for example "/db/origin" packets for "hypocenter" alarms.

NULL value: -

–

Name: *alarmid*

Relation: **alarmcomm alarms**

Description: This field provides a unique integer ID for each alarm issued.

NULL value: -1

Range: alarmid > 0

–

Name: *alarmkey*

Relation: **alarms**

Description: This field gives a unique key for each alarm. The format of the key will vary depending on the class of the alarm. For example, for alarmclass "hypocenter"

alarms the alarm key will often be "evidNNNN" or similar. Usually a maximum of one alarm of each alarmname will be issued for a given alarmkey.

NULL value: -

–

Name: *alarmname*

Relation: **alarms**

Description: This field gives a standardized name for each alarm, usually specifying some kind of template that provides a useful shorthand identifier for alarm condition and recipient list. These alarmnames are generally configured in the alarm-generation software, with names such as "beeper_duty" or "large_local" etc.

NULL value: -

–

Name: *algorithm*

Relation: **beam fplane origin**

Description: This is a brief textual description of the algorithm used for processing (e.g. computing a seismic origin or a beam).

NULL value: -

–

Name: *amp*

Relation: **arrival**

Description: This is the zero-to-peak amplitude of the earth's displacement for a seismic phase. Amp is assumed to be corrected for the response of the instrument.

NULL value: -1.0

Units: Nanometers

Range: amp > 0.0

–

Name: *anet*

Relation: **anetsta**

Description: This is a network code from autoDRM. It may need to be combined with a station code to form a unique key in local databases.

NULL value: -

–

Name: *arid*

Relation: **arrival assoc predarr predmech specdisc stamag wfmeas wfrms arrival_tshift detection**

Description: Each arrival is assigned a unique positive integer identifying it with a unique sta, chan and time. This number is used in the assoc relation along with the origin identifier to link arrival and origin.

NULL value: -1

Range: arid > 0

–

Name: *auth*

Relation: **arrival beam centryd event fplane moment netmag network origin specdisc stamag stassoc wfedit wfmeas calresult calwf qgrid sensorcal sitephotos stanotes**

Description: This records the originator of an arrival (in arrival relation) or origin (in origin relation). Possibilities include externally supplied arrivals identified according to their original source, such as WMO, NEIS, CAN(adian), UK(array), etc. This may also be an identifier of an application generating the attribute, such as an automated interpretation or signal processing program.

NULL value: -

–

Name: *aux*

Relation: **achanaux**

Description: This is the auxiliary code from autoDRM which may need to be combined with the channel code to be unique in a css3.0 database.

NULL value: -

–

Name: *azdef*

Relation: **assoc**

Description: This is a one character flag that indicates whether or not the azimuth of a phase was used to determine the event's origin. It is defining (azdef=d) if used to help locate the event or non-defining (azdef=n) if it is not used.

NULL value: -

Range: azdef =~ /d|n/

–

Name: *azimuth*

Relation: **arrival beam fkgrid stassoc stgrid**

Description: This is the estimated station-to-event azimuth measured clockwise from north. Azimuth is estimated from f-k or polarization analysis. In stassoc, the value may be an analyst estimate.

NULL value: -1.00

Units: Degrees

Range: azimuth >= 0.0 && azimuth < 360.0

–

Name: *azres*

Relation: **assoc**

Description: This is the difference between the measured station-to-event azimuth for an arrival and the true azimuth. The 'true' azimuth is the bearing to the inferred event origin.

NULL value: -999.0

Units: Degrees

Range: azres >= -180.0 && azres <= 180.0

–

Name: *balerfirm*

Relation: **balerlist**

Description: baler firmware revision

NULL value: -

–

Name: *baleron*

Relation: **balerlist**

Description: baler turned on: yes or no

NULL value: -

–

Name: *balersn*

Relation: **balerlist**

Description: baler serial number

NULL value: -

–

Name: *band*

Relation: **instrument**

Description: This is a qualitative indicator of frequency pass-band for an instrument. Values should reflect the response curve rather than just the sample rate. Recommended values are s (short-period), m (mid-period), i (intermediate-period), l (long-period), b (broad-band), h (high frequency, very short-period), and v (very long-period). For a better notion of the instrument characteristics, see the instrument response curve.

NULL value: -

Range: band =~ /s|m|i|l|b|h|v/

–

Name: *belief*

Relation: **assoc**

Description: This is a qualitative estimate of the confidence that a seismic phase is correctly identified.

NULL value: 9.99

Range: belief >= 0.0 && belief <= 1.0

–

Name: *bestdc*

Relation: **moment**

Description: Best Double Couple; If the moment tensor T and P eigenvalues are s1 and s2, respectively, then the scalar siesmic moment is defined as bestdc = (s1+s2)/2. Given in units of mexpon (which see).

NULL value:

–

Name: *cal2rsp*

Relation: **seismometer sensormodel**

Description: This integer is the number of times the output sensor/ digitizer signal response function due to an input calibrator signal must be differentiated in order for the response function shape to match the equivalent response function shape of the sensor/digitizer due to an equivalent shaking input expressed in the natural units of the sensor as given by sensortype. cal2rsp == 0 means that the response function due to a calibrator input is the same shape as the response function due to an equivalent shaking input. cal2rsp > 0 means that the response function due to a calibrator input must be differentiated cal2rsp times in order to match the shape of the response function due to an equivalent shaking input. cal2rsp < 0 means that the response function due to a calibrator input must be integrated -cal2rsp times in order to match the shape of the response function due to an equivalent shaking input.

NULL value: 999

–

Name: *calamp*

Relation: **calwf**

Description: This is the calibration amplitude parameter that is sent to the digitizer DAC.

NULL value: 999.999999

Range: calamp >= -1.0 && calamp <= 1.0

–

Name: *calcmp*

Relation: **calresult**

Description: This string identifies how a measured calib value compares to a nominal value; nn - no nominal value ok - comparison within acceptable limits hi - comparison greater than maximum acceptable limit lo - comparison less than minimum acceptable limit

NULL value: -

–

Name: *caldampr*

Relation: **calresult calwf**

Description: This number expresses the series resistance in ohms of the fixed shunt resistor used to effect sensor damping.

NULL value: -1.000000e+00

Units: ohm

–

Name: *caldrive*

Relation: **calwf seismometer sensormodel**

Description: This indicates if a calibration signal was driven in current/resistive mode (c) or voltage/capacitive mode (v).

NULL value: -

Range: caldrive =~ /c|v/

–

Name: *calerr*

Relation: **calwf**

Description: This indicates if a calibration waveform segment is ok to use for analysis (ok), or if an error occured when the waveform was generated (gap, abt, etc.)

NULL value: -

–

Name: *calfreq*

Relation: **calwf**

Description: This is the sine wave signal frequency parameter in Hertz that is sent to the digitizer for sine wave calibration sequences.

NULL value: 0.00

Units: hertz

Range: calfreq > 0.0

–

Name: *calgen*

Relation: **seismometer sensormodel**

Description: This number expresses the relationship between an input voltage to a sensor calibrator coil and the equivalent ground displacement of the sensor case. The idea is that there is an equivalence between shaking a sensor and electrically stimulating its calibration coil. calgen is specified at a fixed period of calper.

NULL value: 0.0000000e+00

Units: cm/V

–

Name: *calib*

Relation: **calibration wfdisc wftape wftar calresult dmcwf nominalresp seismometer wfsrb**

Description: This is the conversion factor that maps digital seismic data to displacement, velocity, or acceleration, depending on the value of segtype or rsptype. The factor holds true at the oscillation period specified by the attribute calper. A positive value means ground motion (velocity, acceleration) increasing in the component direction (up, north, east) is indicated by increasing counts. A negative value means the opposite. Calib generally reflects the best calibration information available at the time of recording, but refinement may be given in sensor reflecting a subsequent recalibration of the instrument. See calratio.

NULL value: 0

Units: Nanometers/digital count

Range: calib > 0.0

–

Name: *caliberr*

Relation: **calresult**

Description: This number expresses the percentage error of a measured calib value to a nominal calib value.

NULL value: -1.000

Units: %

–

Name: *calibl*

Relation: **nominalresp**

Description: This is the conversion factor that converts digital counts to either volts or amps of input directly to the digitizer. This is normally determined with a loopback mode calibration.

NULL value: 0.000000

Units: uvolts/digital count

Range: calib > 0.0

–

Name: *calinput*

Relation: **calresult calwf**

Description: This indicates a calibration signal is routed: s - sensor is connected to the ADC l - DAC is connected to the ADC directly with no preamp and no loading (DAC output is not connected to cal coil input). DAC is always run in voltage mode. p - DAC is connected to the preamp and then to the ADC and no loading (DAC output is not connected to cal coil input). DAC is always run in voltage mode. d - DAC is connected to the ADC directly with no preamp and DAC output is also connected to the cal coil input. (loaded mode). DAC is run in voltage or current mode according to caldrive. L - DAC is connected to the preamp and the to the ADC and DAC output is also connected to the cal coil input. (loaded mode). DAC is run in voltage or current mode according to caldrive.

NULL value: -

Range: calinput =~ /s|l|p|d|L/

–

Name: *calper*

Relation: **calibration sensor wfdisc wftape wftar calresult dmcwf nominalresp seismometer sensorcal sensormodel wfsrb**

Description: This gives the period for which calib, ncalib and calratio are valid.

NULL value: -1.000000

Units: Seconds

Range: calper >= 0.0

–

Name: *calratio*

Relation: **sensor**

Description: This is a dimensionless calibration correction factor which permits small refinements to the calibration correction made using calib and calper from the wfdisc relation. Often, the wfdisc calib contains the nominal calibration assumed at the time of data recording. If the instrument is recalibrated, calratio provides a mechanism to update calibrations from wfdisc with the new information without modifying the wfdisc relation. A positive value means ground motion increasing in component direction (up, north, east) is indicated by increasing counts. A negative value means the opposite. Calratio is meant to reflect the most accurate calibration information for the time period for which the sensor record is appropriate, but the nominal value may appear until other information is available.

NULL value: 1.000000

–

Name: *calseed*

Relation: **calwf**

Description: This is the random binray telegraph seed parameter that is sent to the digitizer calibrator unit for generating random binray calibration sequences.

NULL value: -

–

Name: *calseq*

Relation: **calresult calwf**

Description: This string identifies a particular calibration sequence. It should be unique across all calibration sequences. Generally a unique sequence goes with a single calwfxx row. The exception is for sine wave sweeps, in which a single sequence id would be used for all of the calwfsw rows corresponding to that sequence.

NULL value:

–

Name: *caltype*

Relation: **calresult calwf**

Description: This indicates the type of calibration. rbc - random binary calibration. swe - sine wave equate calibration. sws - sine wave sweep calibration. fpc - free period calibration imp - impulse function calibration stp - step function calibration

NULL value: -

–

Name: *cdperr*

Relation: **centryd**

Description: Standard error in depth of centroid location; in kilometers.

NULL value:

–

Name: *cert_time*

Relation: **deployment**

Description: Epochal time given as seconds and fractions of a second since hour 0 January 1, 1970, and stored in a double precision floating number. Refers to the relation data object with which it is found. E.g., in arrival - arrival time; in origin - origin time; in wfdisc, - start time of data. Where date of historical events is known, time is set to the start time of that date; where the date of contemporary arrival measurements is known but no time is given, then the time attribute is set to the NA value. The double-precision floating point number allows 15 decimal digits. At 1 millisecond accuracy this is a range of 3 years. Where time is unknown, or prior to Feb. 10, 1653, set to the NA value.

NULL value: -9999999999.99900

Units: Seconds

–

Name: *chan*

Relation: **achanaux arrival calibration fkgrid schanloc sensor sitechan specdisc stage stgrid wfdisc wfedit wfmeas wfrms wftape wftar b059 calresult calwf changed chanperf detection detev digitizer dmcwf gap gsnspec latency nominalresp ratechange replayed retransmit rrdcache seismometer sensorcal trigger wfoffset wfsrb**

Description: This is an eight-character code, which, taken together with sta, jdate and time, uniquely identifies the source of the seismic data, including the geographic location, spatial orientation, sensor and subsequent data processing.

NULL value: -

–

Name: *chanid*

Relation: **arrival sensor sitechan wfdisc wftape wftar wfsrb**

Description: This is the key to the sitechan table.

NULL value: -1

Range: chanid > 0

–

Name: *chanwa*

Relation: **wfmgme**

Description: This is the channel code of the channel that where the wa measurement w for wa measurement was made.

NULL value: -

–

Name: *chident*

Relation: **dlsensor**

Description: This should uniquely identify one or a group of physical channels from a sensor that are connected to a datalogger. It can be a number, or a group designator, such as "A" for the three channels grouping on a Q330 datalogger that would be attached to a single 3-component sensor.

NULL value: -

–

Name: *cksum*

Relation: **dmcseed**

Description: Value of check sum calculated on file.

NULL value: 0

–

Name: *claerr*

Relation: **centryd**

Description: Standard error in latitude of centroid location; in kilometers.

NULL value:

–

Name: *clip*

Relation: **arrival wfdisc wftape wftar wfsrb**

Description: This is a single-character flag to indicate whether (c) or not (n) the data were clipped. Typically, this flag is derived from status bits supplied with GDSN or RSTN data, but could also be supplied as a result of analyst review.

For some data, a 'T' or a 't' in this field indicates a time correction was applied. The exact correction should be found in the associated wfdisc_tshift table.

NULL value: -

Range: clip =~ /c|n|T|t/

–

Name: *cloerr*

Relation: **centryd**

Description: Standrd error in longitude of centroid location; in kilometers.

NULL value:

–

Name: *cnt*

Relation: **latency**

Description: This is the number of packets read and used to compute the statistics for this channel and time period.

NULL value: -1

–

Name: *commid*

Relation: **arrival assoc centryd event moment netmag network origerr origin remark stamag stassoc wfdisc wfedit wftape wftar wfsrb**

Description: This is a key used to point to free-form comments entered in the remark relation. These comments store additional information about a tuple in another relation. Within the remark relation, there may be many tuples with the same commid and different lineno, but the same commid will appear in only one other tuple among the rest of the relations in the database. See lineno.

NULL value: -1

Range: commid > 0

–

Name: *commtype*

Relation: **comm dlsite**

Description: This is a brief textual description that would allow specifications like VSAT, CDMA, regular_internet, DSL, etc.

NULL value: -

–

Name: *conf*

Relation: **origerr**

Description: This attribute denotes the confidence attached to the event attributes smajax, sminax, sdepth and stime.

NULL value: 0.000

Range: conf > 0.0 && conf <= 1.0

–

Name: *connection*

Relation: **balerlist**

Description: This is the text returned from orb /pf/st packet

NULL value: -

–

Name: *coterr*

Relation: **centryd**

Description: Standard error in orgin time of centroid location; in seconds.

NULL value:

–

Name: *ctype*

Relation: **sitechan**

Description: This attribute specifies the type of data channel: n (normal, a normal instrument response), b (beam, a coherent beam formed with array data), i (an incoherent beam or energy stack), or o(other data: no instrument response)

NULL value: -

Range: ctype =~ /n|b|i|o/

–

Name: *dacvmax*

Relation: **q730b**

Description: This number expresses the maximum setting of the calibrator DAC amplitude in volts when in voltage mode.

NULL value: 0.00000000e+00

Units: V

–

Name: *dacvperc*

Relation: **q730b**

Description: This number expresses the number of volts per digital count of the calibrator DAC amplitude when in voltage mode.

NULL value: 0.00000000e+00

Units: V/ct

–

Name: *damp0*

Relation: **calresult nominalresp**

Description: This is the seismometer damping ratio when a free period measurement is being made. This should correspond only to the internal mechanical damping.

NULL value: -1.00000

Range: damp0 >= 0.0

–

Name: *data_end*

Relation: **balerlist**

Description: Data end time in epochal seconds. See field time for more info. This attribute is the time of the last sample of data on the baler.

NULL value: 9999999999.99900

Units: Seconds

–

Name: *data_start*

Relation: **balerlist**

Description: Data start time in epochal seconds. See field time for more info.

NULL value: -9999999999.99900

Units: Seconds

–

Name: *datatype*

Relation: **fkgrid stgrid wfdisc wftape wftar dmcwf wfsrb**

Description: This attribute specifies the format of a data series in the file system. The allowed datatypes are:

aa Alaska version of AH as free-format ascii ah xdr version of AH CA Canada compressed c2 IDA compression of s2 c4 IDA compression of s4 ca AutoDRM/GSE CM6 compressed ascii g2 gain range data ic Intel SAC format i2 Intel/DEC order 2 byte integers i3 Intel/DEC order 3 byte integers i4 Intel/DEC order 4 byte integers rf RefTek packet format s2 Sparc/Motorola order 2 byte integers s3 Sparc/Motorola order 3 byte integers s4 Sparc/Motorola order 4 byte integers sc SAC format sd Steim compressed MiniSeed format S1 Steim 1 compressed MiniSeed format sy SEGY format t4 Sparc/Motorola order IEEE 4 byte floats u4 Intel/DEC order IEEE 4 byte floats UE unevenly sampled data with both time and value zz, z data not saved

Note that the CSS standard defines many other formats, which are not supported by the Antelope software.

NULL value: -

Range: datatype =~ /aa|as|ah|CA|c2|c4|ca|g2|i2|i3|i4|ic|rf|s2|s3|s4|sc|sd|S1|sy|t4|u4|UE|zz|z/

–

Name: *deast*

Relation: **site**

Description: This attribute gives the 'easting' or relative position of an array element, east of the location of the array center specified by the value of refsta. See dnorth.

NULL value: 0.0000

Units: Kilometers

Range: deast >= -20000.0 && deast <= 20000.0

–

Name: *decert_time*

Relation: **deployment**

Description: In wfdisc, this attribute is the time of the last sample in the waveform file. Endtime is equivalent to time+(nsamp-1)/samprate. In sensor, this is the last time the data in the record are valid.

NULL value: 9999999999.99900

Units: Epochal seconds

–

Name: *decifac*

Relation: **stage**

Description: The decimation factor of the input sample rate for digital filters.

NULL value: -1

Range: decifac > -1

–

Name: *delaysec*

Relation: **alarmcomm**

Description: For situations in which messages are sent to several parties in succession, usually with time delays, until the message is acknowledged, this field records the time delay used for each recipient. For recipients in the first

batch of potential responders, delaysec will be 0. For those in successive attempts to communicate, delaysec will be progressively larger positive values, with the exact values depending on the configuration of the calldown lists.

NULL value: -1.0

Range: delaysec >= 0

–

Name: *delaz*

Relation: **arrival**

Description: Delta azimuth. This attribute gives the standard deviation of the azimuth of a signal.

NULL value: -1.00

Units: Degrees

Range: delaz > 0.0

–

Name: *delslo*

Relation: **arrival**

Description: This attribute gives the standard deviation of the slowness of a signal.

NULL value: -1.00

Units: Seconds (of time)/degree

Range: delslo > 0.0

–

Name: *delta*

Relation: **assoc**

Description: This attribute is the arc length of the path the seismic phase follows from source to receiver. The location of the origin is specified in the origin record referenced by the attribute orid. The attribute arid points to the record in the arrival relation that identifies the receiver. The value of the attribute can exceed 180 degrees, it can even exceed 360 degrees. The geographic distance between source and receiver is delta mod(180).

NULL value: -1.000

Units: Degrees

Range: delta >= 0.0

–

Name: *deltim*

Relation: **arrival**

Description: This attribute gives the standard deviation of a detection time.

NULL value: -1.000

Units: Seconds

Range: deltim > 0.0 && deltim < 10.0

–

Name: *demean*

Relation: **specdisc**

Description: In many situations it is appropriate to remove the mean value before calculating the spectrum. This flag indicates whether the mean was removed in the time-series ('y') or not ('n') ;

NULL value: -

Range: demean =~ /y|n/

–

Name: *depdp*

Relation: **origin**

Description: This is a measure of event depth estimated from a depth phase or an average of several depth phases. Depth is measured positive in a downwards direction starting from the earth's surface. See ndp.

NULL value: -999.0000

Units: Kilometers

Range: depdp >= 0.0 && depdp < 1000.0

–

Name: *depth*

Relation: **centryd origin stassoc**

Description: This attribute gives the depth of the event origin. In stassoc this may be an analyst estimate.

NULL value: -999.0000

Units: Kilometers

Range: depth >= 0.0 && depth < 1000.0

–

Name: *descrip*

Relation: **sitechan**

Description: This is a description of the data channel. For non-instrument channels (e.g. beams) this can be the only quantitative description of channel operations in the core tables.

NULL value: -

–

Name: *df*

Relation: **specdisc**

Description: We assume all spectra are discretized at equal frequency intervals (unless spectra are stored in fap2 files). df is the frequency interval.

NULL value: -1

Units: Hertz

Range: df > 0.0

–

Name: *dfile*

Relation: **fkgrid instrument specdisc stage stgrid wfdisc wftape wftar alarms calresult dmcseed dmcwf eids nominalresp qgrid rrdcache rrdgraph sensorcal sensormodel sitephotos stanotes**

Description: In wfdisc, this is the file name of a disk-based waveform file. In instrument, this points to an instrument response file. See dir.

NULL value: -

–

Name: *dfilee*

Relation: **calresult sensorcal**

Description: In calresult, this is the data file which contains the response error functions.

NULL value: -

–

Name: *dfilel*

Relation: **nominalresp**

Description: In nominalresp, this is the data file which contains the loopback mode response functions.

NULL value: -

–

Name: *digital*

Relation: **instrument**

Description: This attribute is a single character flag denoting whether this instrument record describes an analog or digital recording system.

NULL value: -

Range: digital =~ /d|a/

–

Name: *dip*

Relation: **predarr**

Description: Used for strike and dip of a line segment.

NULL value:

–

Name: *dip1*

Relation: **fplane moment**

Description: Dip of First Nodal Plane; In degrees (for sign conventions see Aki and Richards, 1980, p. 106). In fplane, as determied. In moment, refers to best-fitting double couple (see bestdc).

NULL value:

–

Name: *dip2*

Relation: **fplane moment**

Description: Dip of second Nodal Plane; In degrees (for sign conventions see Aki and Richards, 1980, p. 106). In fplane, as determied. In moment, refers to best-fitting double couple (see bestdc).

NULL value:

–

Name: *dir*

Relation: **fkgrid instrument specdisc stage stgrid wfdisc wftape wftar alarms calresult dmcseed eids nominalresp qgrid rrdcache rrdgraph sensorcal sensormodel sitephotos stanotes**

Description: This attribute is the directory-part of a path name. Relative path names or '.' (dot), the notation for the current directory, may be used.

NULL value: -

–

Name: *dist*

Relation: **stassoc**

Description: This attribute gives the approximate source-receiver distance as calculated from slowness (array measurements only), incident angle, or (S-P) times.

NULL value: -1.00

Units: Degrees

Range: dist >= 0.0 && dist <= 180.0

–

Name: *dlauth*

Relation: **dlacq**

Description: This is an authentication code that would be sent to a datalogger as a password for connecting to the datalogger.

NULL value: -

–

Name: *dlcalamp*

Relation: **dlcalwf**

Description: This is the calibration waveform amplitude in volts as produced by the digitizer DAC.

NULL value: 0.00000000

Units: volts

Range: dlcalamp > 0.0

–

Name: *dlcalchanbm*

Relation: **dlcalwf**

Description: This indicates the raw sensor cal channels that were activated.

NULL value: -

–

Name: *dlcalerr*

Relation: **dlcalwf**

Description: This indicates if a calibration waveform segment is ok to use for analysis (ok), or if an error occured when the waveform was generated (gap, abt, etc.)

NULL value: -

–

Name: *dlcalfreq*

Relation: **dlcalwf**

Description: This is the sine wave signal frequency parameter in Hertz that is sent to the digitizer for sine wave calibration sequences.

NULL value: 0.0000

Units: hertz

Range: dlcalfreq > 0.0

–

Name: *dlcalinput*

Relation: **dlcalwf**

Description: This indicates a calibration signal is routed: s - sensor is connected to the ADC d - DAC is connected to the ADC

NULL value: -

Range: dlcalinput =~ /s|d/

–

Name: *dlcalref*

Relation: **sensorcal**

Description: This indicates the source of the reference trace for a calibration result: ref - reference is monitored directly thr - reference is computed theoretically cmp - comparison reference from a previous sensor calibration trace

NULL value: -

Range: dlcalinput =~ /ref|thr|cmp/

–

Name: *dlcalseq*

Relation: **dlcalwf sensorcal**

Description: This string identifies a particular calibration sequence. It should be unique across all calibration sequences. Generally a unique sequence goes with a single calwfxx row. The exception is for sine wave sweeps, in which a single sequence id would be used for all of the calwfsw rows corresponding to that sequence.

NULL value:

–

Name: *dlcalsettle*

Relation: **dlcalwf**

Description: This is a time pad between when the calibrator relays are enabled and when a particular calibration function starts.

NULL value: -1.00000

Units: seconds

Range: dlcalsettle >= 0.0

–

Name: *dlcaltrailer*

Relation: **dlcalwf**

Description: This is a time pad between when a particular calibration function ends and when the calibrator relays are reset to their pre-calibration state.

NULL value: -1.00000

Units: seconds

Range: dlcaltrailer >= 0.0

–

Name: *dlcaltype*

Relation: **dlcalwf sensorcal**

Description: This indicates the type of calibration.

NULL value: -

–

Name: *dlchan*

Relation: **calibration**

Description: A datalogger may insert some channel/loc code id into its output datastream; this field records that id. For some situations, this id is a combination of a channel code and a loc code, separated by an underscore.

NULL value: -

–

Name: *dlcomment*

Relation: **dlevent**

Description: Further description of a dlevent.

NULL value: -

–

Name: *dlevtype*

Relation: **dlevent**

Description: Various user or equipment interactions may occur on a datalogger; this field records they type of event that occurred. Some examples include: "station visit", "massrecenter", "reboot", "calibration", "baler read", etc.

NULL value: -

–

Name: *dlident*

Relation: **dlsensor sensorcal**

Description: This is the serial number of a datalogger that should be unique across dataloggers of a particular model.

NULL value: -

–

Name: *dlip*

Relation: **dlacq**

Description: This is a datalogger's ip address.

NULL value: -

–

Name: *dlmodel*

Relation: **dlsensor sensorcal**

Description: This string identifies a datalogger model.

NULL value:

–

Name: *dlname*

Relation: **calibration balerlist dlacq dlevent dlsite**

Description: datalogger selected within dbbuild

NULL value: -

–

Name: *dlnet*

Relation: **dlacq**

Description: This is a default SEED network code that would normally be assigned to the data channels from a particular datalogger.

NULL value: -

–

Name: *dlport*

Relation: **dlacq**

Description: This is the particular port number or code for acquiring data from a datalogger that supports multiple independent acquisition ports.

NULL value: -

–

Name: *dlsta*

Relation: **calibration dlacq q330comm**

Description: A datalogger may insert some network/station id into its output datastream; this field records that id. For some dataloggers, this id is a combination of a network code and a station code, separated by an underscore.

NULL value: -

–

Name: *dmcid*

Relation: **dmcseed**

Description: This is a temproary id number to label seed files to make the IRIS DMC software work.

NULL value: -1

Range: dmcid > 0

–

Name: *dnorth*

Relation: **site**

Description: This attribute gives the 'northing' or relative position of array element north of the array center specified by the value of refsta. See deast.

NULL value: 0.0000

Units: Kilometers

Range: dnorth >= -20000.0 && dnorth <= 20000.0

–

Name: *dsettings*

Relation: **q730b**

Description: This integer contains a bitmap of the normal default calibrator damping settings for units with variable damping. These are the settings that should be in effect whenever the digitizer is in its normal operational mode with no active calibration sequences. The bits are mapped as follows (bit 0 is LSB): bits bank 0-7 channel 0 8-15 channel 1 16-23 channel 2 24-31 channel 3

NULL value: -1

–

Name: *dtime*

Relation: **fkgrid stgrid**

Description: This is a time increment in seconds.

NULL value: 0.00

Range: dtime > 0.0

–

Name: *dtype*

Relation: **origin**

Description: This single-character flag indicates the method by which the depth was determined or constrained during the location process. The recommended values are f (free), d (from depth phases), r (restrained by location program) or g (restrained by geophysicist). In cases r or g, either the auth field should indicate the agency or person responsible for this action, or the commid field should point to an explanation in the remark relation.

NULL value: -

Range: dtype =~ /f|d|r|g/

–

Name: *dup_pktid*

Relation: **retransmit**

Description: Each packet in an orb ring buffer has a unique packet id; when a packet appears more than once in the ring buffer, this is the pktid of the matching previous packet.

NULL value: -1

Range: dup_pktid >= 0

–

Name: *durat*

Relation: **centryd**

Description: Half-duration of source; in seconds.

NULL value:

–

Name: *dused*

Relation: **centryd moment**

Description: Type of Data Used in Inversion; A character string giving the type(s) of data used to determine centroid location or moment tensor (e.g., "GDSN, GDSN+IDS," etc.). Case = upper

NULL value:

–

Name: *edepth*

Relation: **sitechan**

Description: This attribute gives the depth in kilometers at which the instrument is positioned, relative to the value of elev in the site relation.

NULL value: -9.9999

Units: kilometers

Range: edepth >= 0.0

–

Name: *edid*

Relation: **wfedit**

Description: Each wfedit record is assigned a unique positive integer identifying it.

NULL value: -1

Range: edid 0

–

Name: *edittype*

Relation: **wfedit**

Description: Edit type identifier. Each edit is assigned an eight character string identifying the suggested processing to be applied to ameliorate the problem.

NULL value: -

–

Name: *elev*

Relation: **site dlsite gps q330comm**

Description: This attribute is the elevation of a seismic station relative to mean sea level.

NULL value: -999.0000

Units: Kilometers

Range: elev >= -10.0 && elev <= 10.0

–

Name: *ema*

Relation: **arrival predarr**

Description: This attribute is the emergence angle of an arrival, as observed at a three-component station or array. The value increases from the vertical direction towards the horizontal.

NULL value: -1.00

Units: Degrees

Range: ema >= 0.0 && ema <= 90.0

–

Name: *emares*

Relation: **assoc**

Description: This attribute is the difference between an observed emergence angle and the theoretical prediction for the same phase, assuming an event location as specified by the accompanying orid.

NULL value: -999.0

Units: Degrees

Range: emares >= -90.0 && emares <= 90.0

–

Name: *emodelt*

Relation: **emodel**

Description: Provides a bound estimate on the effect of velocity model errors complimentary to conventional covariance estimate. This component is for the origin time in seconds.

NULL value: -1

–

Name: *emodelx*

Relation: **emodel**

Description: Provides a bound estimate on the effect of velocity model errors complimentary to conventional covariance estimate. This component is for the EW direction in km.

NULL value: -1

–

Name: *emodely*

Relation: **emodel**

Description: Provides a bound estimate on the effect of velocity model errors complimentary to conventional covariance estimate. This component is for the NS direction in km.

NULL value: -1

–

Name: *emodelz*

Relation: **emodel**

Description: Provides a bound estimate on the effect of velocity model errors complimentary to conventional covariance estimate. This component is for the vertical direction in km.

NULL value: -1

–

Name: *endtime*

Relation: **calibration fkgrid sensor specdisc stage stgrid wfdisc wfedit wfmeas wftape wftar b051 b059 balerlist calresult calwf chanperf comm deployment digitizer dlacq dlcalwf dlchannel dlsensor dlsite dmcwf gsnspec netperf nominalresp q330comm q730b qgrid ratechange replayed rrdcache rrdgraph seismometer sensorcal stanotes wfdisc_tshift wfoffset wfsrb**

Description: In wfdisc, this attribute is the time of the last sample in the waveform file. Endtime is equivalent to time+(nsamp-1)/samprate. In sensor, this is the last time the data in the record are valid.

NULL value: 9999999999.99900

Units: Epochal seconds

Range: time <= endtime

–

Name: *equip_install*

Relation: **deployment**

Description: Epochal time given as seconds and fractions of a second since hour 0 January 1, 1970, and stored in a double precision floating number. Refers to the relation data object with which it is found. E.g., in arrival - arrival time; in origin - origin time; in wfdisc, - start time of data. Where date of historical events is known, time is set to the start time of that date; where the date of contemporary arrival measurements is known but no time is given, then the time attribute is set to the NA value. The double-precision floating point number allows 15 decimal digits. At 1 millisecond accuracy this is a range of 3 years. Where time is unknown, or prior to Feb. 10, 1653, set to the NA value.

NULL value: -9999999999.99900

Units: Seconds

–

Name: *equip_remove*

Relation: **deployment**

Description: In wfdisc, this attribute is the time of the last sample in the waveform file. Endtime is equivalent to time+(nsamp-1)/samprate. In sensor, this is the last time the data in the record are valid.

NULL value: 9999999999.99900

Units: Epochal seconds

–

Name: *esaz*

Relation: **assoc predarr**

Description: This attribute is the calculated event-to-station azimuth, measured in degrees clockwise from North.

NULL value: -999.00

Units: Degrees

Range: esaz >= 0.0 && esaz <= 360.0

–

Name: *etype*

Relation: **origin stassoc**

Description: This attribute is used to identify the type of seismic event, when known. For etypes l, r, t the value in origin will be the value determined by the station closest to the event.

NULL value: -

Range: etype =~ /qb|eq|me|ex|o|l|r|t/

–

Name: *evid*

Relation: **event netmag origin stamag alarms**

Description: Each event is assigned a unique positive integer which identifies it in a database. It is possible for several records in the origin relation to have the same evid. This indicates there are several opinions about the location of the event.

NULL value: -1

Range: evid > 0

–

Name: *evname*

Relation: **event**

Description: This is the common name of the event identified by evid.

NULL value: -

–

Name: *fc*

Relation: **calibration wfrms gsnspec**

Description: This is a frequency in Hertz that is in the center of a particular pass band. This is used to describe the center frequency of a seismic instrument pass band, for instance.

NULL value: -1.000000

Range: fc >= 0.0

–

Name: *fchan*

Relation: **achanaux schanloc dlcalwf dlchannel**

Description: This is the channel code from SEED or autoDRM which many need to be combined with an auxiliary or location code to be unique in a css3.0 database.

NULL value: -

–

Name: *fileno*

Relation: **wftar dmcseed**

Description:

NULL value: -1

–

Name: *filled*

Relation: **gap**

Description: When data gaps are small, it's more efficient to flag the gap with a special value in the waveform file rather than a new record in the wfdisc table. This flag indicates whether the gap was filled in the waveform file ('y') or caused a

new wfdisc record to be created ('n') ;

NULL value: -

Range: filled =~ /y|n/

–

Name: *filter*

Relation: **beam fkgrid stgrid wfmeas wfrms detection detev trigger wfmgme**

Description: This is a character string filter specification. (e.g. "BW 1.0 5 5.0 5" for a Butterworth bandpass filter from 1 to 5 hz with 5 poles at each end)

NULL value: -

–

Name: *fm*

Relation: **arrival predmech**

Description: This is a two-character indication of first motion. The first character describes first motion seen on short-period channels and the second holds for long-period instruments. Compression (dilation) on a short-period sensor is denoted by c(d) and compression (dilation) on a long-period sensor is denoted by u(r). Empty character positions will be indicated by dots (e.g., '.r'). Empty character positions indicate a measurement that is not determinable or applicable.

NULL value: -

Range: fm =~ /[cd.][ur.]/

–

Name: *foff*

Relation: **fkgrid specdisc stgrid wfdisc wftar alarms dmcwf qgrid wfsrb**

Description: This is the byte offset of a waveform segment within a data file. It is used when data are multiplexed. See dir and dfile.

NULL value: 0

Range: foff >= 0

–

Name: *format*

Relation: **sitephotos stanotes**

Description: This is the graphics format (e.g. gif, jpg) of a stored image or stored movie.

NULL value: -

–

Name: *fp*

Relation: **calresult nominalresp**

Description: This is the seismometer mass free period in seconds.

NULL value: 0.000

Units: seconds

Range: fp > 0.0

–

Name: *freqmax*

Relation: **specdisc**

Description: Most spectra have the Nyquist frequency as the last frequency, but we need to add this field to allow possibility of starting at a nonzero value.

NULL value: -1

Units: Hertz

Range: freqmax >= freqmin

–

Name: *freqmin*

Relation: **specdisc**

Description: Most spectra have zero as the first frequency, but we need to add this field to allow possibility of starting at a nonzero value.

NULL value: -1

Units: Hertz

Range: freqmin >= 0.0

–

Name: *fsta*

Relation: **anetsta snetsta dlcalwf dlchannel**

Description: This is the common code-name of a seismic observatory. from SEED or autoDRM. It may need to be combined with the network code to form a unique code in local

databases.

NULL value: -

–

Name: *gcalib*

Relation: **stage**

Description: This is the correction to the nominal scaling factor of this stage. gnom multiplied by gcalib yields the exact scale factor for the stage. gcalib is dimensionless.

NULL value: 0.000000

Range: gcalib > 0.0

–

Name: *gnom*

Relation: **stage**

Description: This is the nominal scaling factor of this stage. It can have units associated with it if the stage is a sensor or have no units if the stage is a filter or amplifier.

NULL value: 0

Range: gnom > 0.0

–

Name: *gpsqual*

Relation: **gps**

Description: This is a measure of the quality of gps lock status. Could be 2d or 3d for the type of lock. Could also indicate if the clock has geodetic precision or standard precision.

NULL value: -

–

Name: *grn*

Relation: **gregion origin**

Description: This is a geographic region number, as defined by Flinn, Engdahl and Hill (Bull. Seism. Soc. Amer. vol 64, pp. 771-992, 1974). See grname.

NULL value: -1

Range: grn > 0

–

Name: *grname*

Relation: **gregion**

Description: This attribute is the common name of a geographic region, as given in Flinn, Engdahl and Hill (Bull. Seism. Soc. Amer., vol 64, pp 771-992, 1974). Names may have changed due to changing political circumstances (e.g., old RHODESIA = new ZIMBABWE). See grn and srname.

NULL value: -

–

Name: *gtype*

Relation: **stage**

Description: This is the description of the stage such as seismometer, A/D, FIR filter, IIR filter, preamplifier, ...

NULL value: -

–

Name: *hang*

Relation: **sitechan**

Description: This attribute specifies the orientation of the seismometer in the horizontal plane, measured clockwise from North. For a North-South orientation with the seismometer pointing toward the north, hang=0.; for East-West orientation with the seismometer pointing toward the west, hang=270. See vang.

NULL value: -999.9

Units: Degrees

Range: hang >= 0.0 && hang <= 360.0

–

Name: *hostname*

Relation: **calresult dmcseed sensorcal**

Description: Computer host name where processing was conducted.

NULL value:

–

Name: *htmlinfo*

Relation: **balerlist**

Description: were html information files downloaded: yes or no

NULL value: -

–

Name: *htmlsecs*
Relation: **balerlist**
Description: Number of seconds from first command to baler on until html download completes or fails.

NULL value: -1
Units: Seconds
Range: htmlsecs >= 0

–
Name: *id*
Relation: **iptable**
Description:
NULL value: -

–
Name: *idtag*
Relation: **dlsite q330comm**
Description: This is an twelve-character code, which uniquely identifies the a piece of equipment such as a datalogger or sensor. idtag can be used when there are two identification strings associated with at datalogger such as a Q330 which has a 16-digit hexadecimal number adn also a human readable idtag

NULL value: -

–
Name: *imagedescrip*
Relation: **sitephotos**
Description: This is a description of an image stored in a database.

NULL value: -

–
Name: *imagename*
Relation: **sitephotos**
Description: This field records the name of an image

NULL value: -

–

Name: *imagesize*

Relation: **sitephotos**

Description: This field records the size of a thumbnail or frame image, for applications that might have several different scales of thumbails or frames. The contents of this field should be determined by the end-user application of the database contents, however a fairly standard approach might be to use the phrases better yet an approximate size specifier such as For the full-size original images, imagesize should be set to

NULL value: -

–

Name: *imb*

Relation: **stassoc**

Description: This is an analyst's estimate of the body wave magnitude using data from a single station. See iml, ims, magnitude, magtype, mb, ml and ms.

NULL value: -999.00

–

Name: *iml*

Relation: **stassoc**

Description: This is an analyst's estimate of the local magnitude using data from a single station. See imb, ims, magnitude, magtype, mb, ml and ms.

NULL value: -999.00

–

Name: *ims*

Relation: **stassoc**

Description: This is an analyst's estimate of surface wave magnitude using data from a single station. See magnitude, magtype, mb, ml, ms, imb and iml.

NULL value: -999.00

–

Name: *inid*

Relation: **instrument sensor**

Description: This is a unique key to the instrument relation. Inid provides the only link between sensor and instrument.

NULL value: -1

Range: inid > 0

–

Name: *inp*

Relation: **balerlist q330comm**

Description: 50-character string, which provides information about communications, ip address, port number, logical port number.

NULL value: -

–

Name: *insname*

Relation: **calibration instrument gps gsnspec**

Description: This is a character string containing the name of the instrument.

NULL value: -

–

Name: *instant*

Relation: **sensor**

Description: When this attribute has the value instant = 'y', it means that the snapshot was taken at the time of a discrete procedural change, such as an adjustment of the instrument gain; n means the snapshot is of a continuously changing process, such as calibration drift. This is important for tracking time corrections and calibrations.

NULL value: -

Range: instant =~ /y|n/

–

Name: *instype*

Relation: **instrument wfdisc wftape wftar wfsrb**

Description: This character string is used to indicate the instrument type. Some examples are: SRO, ASRO, DWWSSN, LRSM, and S-750.

NULL value: -

–

Name: *iphase*

Relation: **arrival detev**

Description: This eight-character field holds the name initially given to a seismic phase. Standard seismological labels for the types of signals (or phases) are used (e.g., P, PKP, PcP, pP). Both upper and lower case letters are available and should be used when appropriate, for example, pP or PcP. See phase.

NULL value: -

–

Name: *iunits*

Relation: **stage**

Description: This is the input units which are appropriate for the stage. For a seismometer the input units may be m/sec or cm/sec, for a analog-to-digital converter the input units will be V.

NULL value: -

–

Name: *izero*

Relation: **stage**

Description: Index within fir coefficients corresponding to the 0th sample. This is needed for asymetric FIR filters, or filters that are causal.

NULL value: 0

Range: izero >= 0

–

Name: *jdate*

Relation: **arrival centryd origin sensor wfdisc wftape wftar wfsrb**

Description: This attribute is the date of an arrival, origin, seismic recording, etc. The same information is available in epoch time, but the Julian date format is more convenient for many types of searches. Dates B.C. are negative. Note: there is no year = 0000 or day = 000. Where only the year is known, day of year = 001; where only year and month are known, day of year = first day of month. Note: only the year is negated for BC, so Jan 1 of 10 BC is 0010001. See time.

NULL value: -1

Range: jdate == yearday(time)

–

Name: *keyname*

Relation: **lastid**

Description: This attribute contains the actual name of a key whose last assigned numeric value is saved in keyvalue.

NULL value: -

Range: keyname =~ /arid|chanid|commid|edid|evid|inid|magid|orid|stassid|wfid/

–

Name: *keyvalue*

Relation: **lastid**

Description: This attribute maintains the last assigned value (a positive integer) of the counter for the specified keyname. The number keyvalue is the last counter value used for the attribute keyname. Key values are maintained in the database to ensure uniqueness.

NULL value: -1

Range: keyvalue > 0

–

Name: *lat*

Relation: **centryd origin site stassoc dlsite gps q330comm**

Description: This attribute is the geographic latitude. Locations north of the equator have positive latitudes.

NULL value: -999.0000

Units: Degrees

Range: lat >= -90.0 && lat <= 90.0

–

Name: *latmax*

Relation: **latency**

Description: This is the maximum latency in seconds between local time and the computed last time in the latest packet over the period.

NULL value: -89999999999

Units: seconds

–

Name: *latmin*

Relation: **latency**

Description: This is the minium latency in seconds between local time and the computed last time in the latest packet over the period.

NULL value: -89999999999

Units: seconds

–

Name: *lddate*

Relation: **achanaux affiliation anetsta arrival assoc beam calibration centryd emodel event fkgrid fplane gregion instrument lastid moment netmag network origerr origin predarr predmech remark schanloc sensor site sitechan snetsta specdisc sregion stage stamag stassoc stgrid wfdisc wfedit wfmeas wfrms wftag wftape wftar alarmcomm alarms arrival_tshift b051 b059 balerlist calresult calwf changed chanperf comm deployment detection detev digitizer dlacq dlcalwf dlchannel dlevent dlsensor dlsite dmcseed dmcwf eids gap gps gsnspec iptable latency netperf nominalresp q330comm q730b qgrid ratechange replayed retransmit rrdcache rrdgraph seismometer sensorcal sensormodel sitephotos stanotes trigger wfdisc_tshift wfmgme wfoffset wfsrb**

Description: This is the last time the record was modified.

NULL value: -9999999999.99900

Units: Seconds

–

Name: *lead*

Relation: **calibration**

Description: This identifies the datalogger input lead.

NULL value: -

–

Name: *leadfac*

Relation: **stage**

Description: This factor is used to correct the situation of using a 24-bit A/D converter and storing the data in a 4 byte word. If the data are stored in the lower 3 bytes of the 4 byte word then leadfac=1.0 If the data are stored in the high bytes then it will be a large factor which is divided from gnom.

NULL value: 0.0000000

Range: leadfac > 0.0

–

Name: *lineno*

Relation: **remark**

Description: This integer attribute is assigned as a sequence number for multiple line comments. The combination of commid and lineno is unique.

NULL value: -1

Range: lineno > 0

–

Name: *loc*

Relation: **schanloc dlcalwf dlchannel**

Description: This is the location code from SEED which may need to be combined with the channel code to be unique in a css3.0 database.

NULL value: -

–

Name: *location*

Relation: **stassoc**

Description: This character string describes the location of an event identified from data recorded at a single station. Two examples are Fiji-Tonga and Semipalatinsk.

NULL value: -

–

Name: *logat*

Relation: **arrival**

Description: This measurement (logarithm of amplitude/period) of signal size is often reported instead of the amplitude and period separately. This attribute is only filled if the separate measurements are not available.

NULL value: -999.00

Units: Log (Nanometers/seconds)

–

Name: *lon*

Relation: **centryd origin site stassoc dlsite gps q330comm**

Description: This attribute is the geographic longitude in degrees. Longitudes are measured positive east of the Greenwich meridian.

NULL value: -999.0000

Units: Degrees

Range: lon >= -180.0 && lon <= 180.0

–

Name: *magid*

Relation: **netmag stamag**

Description: This key is assigned to identify a network magnitude in the netmag relation. It is required for every network magnitude. Magnitudes given in origin must reference a network magnitude with magid = mbid, mlid or msid, whichever is appropriate. See mbid, mlid, or msid.

NULL value: -1

Range: magid > 0

–

Name: *magnitude*

Relation: **netmag stamag**

Description: This gives the magnitude value of the type indicated in attribute magtype. It is derived in a variety of ways, which are not necessarily linked directly to an arrival. See imb, iml, ims, magtype, mb, ml and ms.

NULL value: -99.99

–

Name: *magtype*

Relation: **netmag stamag**

Description: This character string is used to specify whether the magnitude value represents mb (body wave magnitude), ms (surface wave magnitude), ml (local magnitude) or other appropriate magnitude measure. See imb, iml, ims, magnitude, mb, ml, ms.

NULL value: -

–

Name: *manu*
Relation: **digitizer seismometer**
Description: This string identifies a manufacturer.

NULL value:

–
Name: *maxlat*
Relation: **qgrid**
Description: This is the highest latitude of a dbgme grid

NULL value: -999.0000
Units: maxlat >= -90.0 && maxlat <= 90.0

–
Name: *maxlon*
Relation: **qgrid**
Description: This is the easternmost longitude of a dbgme grid

NULL value: -999.0000
Units: maxlon >= -180.0 && maxlon <= 180.0

–
Name: *maxrate*
Relation: **ratechange**
Description: This attribute is the sample rate in samples/second. In the instrument relation this is specifically the nominal sample rate, not accounting for clock drift. In wfdisc, the value may vary slightly from the nominal to reflect clock drift.

NULL value: -1.0000000
Units: 1/seconds
Range: maxrate > 0.0

–
Name: *maxval*
Relation: **qgrid**
Description: This is the maximum absolute value of a measurement that is stored in a given ground-motion grid. The maxval has the same units as the stored grid, as

specified in the 'units' field.

NULL value: -9999999.000

–

Name: *mb*

Relation: **origin**

Description: This is the body wave magnitude of an event. Associated with this attribute is the identifier mbid which points to magid in the netmag relation. The information in that record summarizes the method of analysis and data used. See imb, iml, ims, magnitude, magtype, ml and ms.

NULL value: -999.00

–

Name: *mbid*

Relation: **origin**

Description: This stores the magid for a record in netmag. Mbid is a foreign key joining origin to netmag where origin. mbid = netmag. magid. See magid, mlid and msid.

NULL value: -1

Range: mbid > 0

–

Name: *mean*

Relation: **latency**

Description: This is the mean difference in seconds between local time and the computed last time in the latest packet for this channel.

NULL value: -89999999999

Units: seconds

–

Name: *meastype*

Relation: **wfmeas**

Description: This field describes the type of measurement performed on a waveform, for example "amplitude" or "rms". This determines how to interpret the other fields in the wfmeas table.

NULL value:

–

Name: *mechid*

Relation: **fplane predmech**

Description: Each focal mechanism needs to assigned a unique mechanism id. A seperate key from orid is necessary because it is possible for different methods to be used to produce different solutions from the same first motion data. Note this key is for traditional focal mechanism solutions only. The moment table is used for moment tensor solutions and each moment tensor solution will have a unique orid.

NULL value: -1

Range: mechid > 0

–

Name: *method*

Relation: **specdisc**

Description: Descriptive word describing spectral estimation method used to estimate this spectral file. e.g. multitaper, maximum likelihood, etc.

NULL value: -

–

Name: *mexpon*

Relation: **moment**

Description: Exponet of Moment Scale Factor; The power of 10 by which scalar moment (bestdc) or moment tensor components (mrr, mtt, etc.) and their corresponding errors are to be multiplied to give their actual values. As an example, if mexpon=17 and bestdc=1.3, then the scalar moment is given by 1.3x10**17 N.-m.

NULL value:

–

Name: *mff*

Relation: **moment**

Description: Moment Tensor Components; Given in a spherical coordinate system - for conventions and conversion to a Cartesian (x,y,z) system, see Aki & Richards, 1980,p. 118). In units given by mexpon (which see).

NULL value:

–

Name: *mfferr*

Relation: **moment**

Description: Moment Tensor Components; Given in a spherical cooridnate system - for conventions and conversion to a Cartesian (x,y,z) system, see Aki & Richards, 1980, p. 118). In units given by mexpon (which see).

NULL value:

–

Name: *minlat*

Relation: **qgrid**

Description: This is the lowest latitude of a dbgme grid

NULL value: -999.0000

Units: minlat >= -90.0 && minlat <= 90.0

–

Name: *minlon*

Relation: **qgrid**

Description: This is the westernmost longitude of a dbgme grid

NULL value: -999.0000

Units: minlon >= -180.0 && minlon <= 180.0

–

Name: *minrate*

Relation: **ratechange**

Description: This attribute is the sample rate in samples/second. In the instrument relation this is specifically the nominal sample rate, not accounting for clock drift. In wfdisc, the value may vary slightly from the nominal to reflect clock drift.

NULL value: -1.0000000

Units: 1/seconds

Range: minrate > 0.0

–

Name: *ml*

Relation: **origin**

Description: This is the local magnitude of an event. Associated with this attribute is the identifier mlid, which points to magid in the netmag relation. The information in that record summarizes the method of analysis and the data used. See imb, iml, ims, magnitude, magtype, mb and ms.

NULL value: -999.00

–

Name: *mlid*

Relation: **origin**

Description: This stores the magid for a record in netmag. Mlid is a foreign key joining origin to netmag where origin. mlid = netmag. magid. See magid, sid and mbid.

NULL value: -1

Range: mlid > 0

–

Name: *model*

Relation: **digitizer dlacq dlcalwf dlchannel dlsite seismometer**

Description: This string identifies a model.

NULL value:

–

Name: *mrf*

Relation: **moment**

Description: Moment Tensor Components; Given in a spherical coordinate system - for conventions and conversion to a Cartesian (x,y,z) system, see Aki & Richards, 1980,p. 118). In units given by mexpon (which see).

NULL value:

–

Name: *mrferr*

Relation: **moment**

Description: Moment Tensor Components; Given in a spherical cooridnate system - for conventions and conversion to a Cartesian (x,y,z) system, see Aki & Richards, 1980, p. 118). In units given by mexpon (which see).

NULL value:

–

Name: *mrr*

Relation: **moment**

Description: Moment Tensor Components; Given in a spherical coordinate system - for conventions and conversion to a Cartesian (x,y,z) system, see Aki & Richards, 1980,p. 118). In units given by mexpon (which see).

NULL value:

–

Name: *mrrerr*

Relation: **moment**

Description: Moment Tensor Components; Given in a spherical cooridnate system - for conventions and conversion to a Cartesian (x,y,z) system, see Aki & Richards, 1980, p. 118). In units given by mexpon (which see).

NULL value:

–

Name: *mrt*

Relation: **moment**

Description: Moment Tensor Components; Given in a spherical coordinate system - for conventions and conversion to a Cartesian (x,y,z) system, see Aki & Richards, 1980,p. 118). In units given by mexpon (which see).

NULL value:

–

Name: *mrterr*

Relation: **moment**

Description: Moment Tensor Components; Given in a spherical cooridnate system - for conventions and conversion to a Cartesian (x,y,z) system, see Aki & Richards, 1980, p. 118). In units given by mexpon (which see).

NULL value:

–

Name: *ms*

Relation: **origin**

Description: This is the surface wave magnitude for an event. Associated with this attribute is the identifier msid, which points to magid in the netmag relation. The information in that record summarizes the method of analysis and the data used. See imb, iml, ims, magnitude, magtype, mb and ml.

NULL value: -999.00

–

Name: *msdinfo*

Relation: **balerlist**

Description: was a listing of miniseed files downloaded: yes or no

NULL value: -

–

Name: *msdsecs*

Relation: **balerlist**

Description: Number of seconds from first command to baler to list miniseed contents until completes or fails.

NULL value: -1

Units: Seconds

Range: msdsecs >= 0

–

Name: *msid*

Relation: **origin**

Description: This stores the magid for a record in netmag. Msid is a foreign key joining origin to netmag where origin. msid = netmag. magid. See magid, mlid and mbid.

NULL value: -1

Range: msid > 0

–

Name: *mtf*

Relation: **moment**

Description: Moment Tensor Components; Given in a spherical coordinate system - for conventions and conversion to a Cartesian (x,y,z) system, see Aki & Richards, 1980,p. 118). In units given by mexpon (which see).

NULL value:

–

Name: *mtferr*

Relation: **moment**

Description: Moment Tensor Components; Given in a spherical cooridnate system - for conventions and conversion to a Cartesian (x,y,z) system, see Aki & Richards, 1980, p. 118). In units given by mexpon (which see).

NULL value:

–

Name: *mtt*

Relation: **moment**

Description: Moment Tensor Components; Given in a spherical coordinate system - for conventions and conversion to a Cartesian (x,y,z) system, see Aki & Richards, 1980,p. 118). In units given by mexpon (which see).

NULL value:

–

Name: *mtterr*

Relation: **moment**

Description: Moment Tensor Components; Given in a spherical cooridnate system - for conventions and conversion to a Cartesian (x,y,z) system, see Aki & Richards, 1980, p. 118). In units given by mexpon (which see).

NULL value:

–

Name: *nass*

Relation: **origin**

Description: This attribute gives the number of arrivals in this database which are associated with the origin.

NULL value: -1

Range: nass > 0

–

Name: *naxazm*

Relation: **moment**

Description: Null Axis Azimuth and Plunge; Obtained by rotation of the moment tensor into the principal axes system. Associated with the small intermediate eigen value. In degrees, for conventions see Aki & Richards (1980).

NULL value:

–

Name: *naxplg*

Relation: **moment**

Description: Null Axis Azimuth and Plunge; Obtained by rotation of the moment tensor into the principal axes system. Associated with the small intermediate eigen value. In degrees, for conventions see Aki & Richards (1980).

NULL value:

–

Name: *naxval*

Relation: **moment**

Description: Length of Null-Axis Vector; Obtained by rotation of the moment tensor into the principal axes system. Units given by mexopon (which see).

NULL value:

–

Name: *ncalib*

Relation: **instrument**

Description: This is the conversion factor that maps digital data to earth displacement. The factor holds true at the oscillation period specified by ncalper. A positive value means ground motion increasing in component direction (up, north, east) is indicated by increasing counts. A negative value means the opposite. Actual calibration for a particular recording is determined using the wfdisc and sensor relations. See calratio.

NULL value: -99.999999

Units: Nanometers/digital count

–

Name: *ncalper*

Relation: **instrument**

Description: This attribute is the period for which ncalib is valid.

NULL value: -1.000000

Units: seconds

Range: ncalper >= 0.0

–

Name: *nchans*

Relation: **q730b**

Description: This integer is the number of physical channels within a digitizer.

NULL value: 999

–

Name: *ndef*

Relation: **origin**

Description: This attribute is typically the number of arrivals used to locate an event. See timedef. However, for catalogs from which arrivals are not available (e.g., the PDE catalog), ndef is filled in from the catalog, but nass is the number of arrivals in this database which come from this event.

NULL value: -1

Range: ndef > 0

–

Name: *ndp*

Relation: **origin**

Description: This attribute gives the number of depth phases used in calculating depth and/or depdp. See depdp.

NULL value: -1

Range: ndp >= 0

–

Name: *ne*

Relation: **fkgrid**

Description: Number of east-west values.

NULL value: -1

Range: ne > 0

–

Name: *net*

Relation: **affiliation netmag network calresult calwf deployment digitizer dmcseed gps nominalresp rrdcache rrdgraph seismometer**

Description: This character string is the name of a seismic network. One example is WWSSN.

NULL value: -

–

Name: *netname*

Relation: **network**

Description: String containing the name of a network."

NULL value: -

–

Name: *nettype*

Relation: **network**

Description: This 4 character string specifies what type of network (ar = array), (lo = local area), (ww = world-wide) for the given value of net.

NULL value: -

–

Name: *nfreq*

Relation: **specdisc**

Description: Actual number of frequency samples in spectral files. Note contrast to rayleigh.

NULL value: -1

Range: nfreq > 0

–

Name: *nlat*

Relation: **qgrid**

Description: This attribute gives the number of grid points in the latitude direction for the dbgme grid.

NULL value: -1

Units: -

Range: nlat > 0

–

Name: *nlon*

Relation: **qgrid**

Description: This attribute gives the number of grid points in the longitude direction for the dbgme grid.

NULL value: -1

Units: -

Range: nlon > 0

–

Name: *nn*

Relation: **fkgrid**

Description: Number of north-south values.

NULL value: -1

Range: nn > 0

–

Name: *npchan*
Relation: **netperf**
Description:
NULL value: 0
Range: npchan > 0

–
Name: *npsta*
Relation: **netperf**
Description:
NULL value: 0
Range: npsta > 0

–
Name: *nrlpb*
Relation: **centryd**
Description: Number of mantle wave records. The number of records used in inversion. See also nslpb.

NULL value:

–
Name: *nrmw*
Relation: **centryd**
Description: The number of records used in inversion. See also nsmw.

NULL value:

–
Name: *ns*
Relation: **stgrid**
Description: Number of slowness values.

NULL value: -1
Range: ns > 0

–
Name: *nsamp*
Relation: **wfdisc wftape wftar dmcwf wfsrb**
Description: This quantity is the number of samples in a waveform segment.

NULL value: -1
Range: nsamp > 0

–

Name: *nsat*

Relation: **gps**

Description:

NULL value: -1

–

Name: *nslpb*

Relation: **centryd**

Description: Number of stations supplying mantle wave records. Refers to number of stations used in inversion. (There may be several records per station -see nrlpb).

NULL value:

–

Name: *nsmw*

Relation: **centryd**

Description: Refers to number of stations used in inversion. (There may be several records per station - see nrmw).

NULL value:

–

Name: *nsta*

Relation: **netmag**

Description: This quantity is the number of stations used to compute the magnitude of the event.

NULL value: -1

Range: nsta > 0

–

Name: *nt*

Relation: **fkgrid stgrid**

Description: Number of time values.

NULL value: -1

Range: nt > 0

–

Name: *nwin*

Relation: **specdisc**

Description: Number of windows used to produce specta.

NULL value: -1

Range: nwin > 0

–

Name: *offdate*

Relation: **site sitechan**

Description: This attribute is the Julian Date on which the station or sensor indicated was turned off, dismantled, or moved. See ondate.

NULL value: -1

Range: offdate >= 1900001 && offdate <= 2100000

–

Name: *offset*

Relation: **specdisc**

Description: This parameter is relevant for Welsh averaged spectra . Other spectral estimates would set this value to null.

NULL value: -1.00

Range: offset > 0.0

–

Name: *ondate*

Relation: **site sitechan**

Description: This attribute is the Julian Date on which the station or sensor indicated began operating. Offdate and ondate are not intended to accommodate temporary downtimes, but rather to indicate the time period for which the attributes of the station (lat, lon, elev) are valid for the given station code. Stations are often moved, but with the station code remaining unchanged.

NULL value: -1

Range: ondate >= 1900001&& ondate <= 2100000

–

Name: *onsecs*

Relation: **balerlist**

Description: Number of seconds from first command to turn baler on until either turned on or turn on fails.

NULL value: -1

Units: Seconds

Range: onsecs >= 0

–

Name: *orb*

Relation: **replayed**

Description: This is the name of the orbserver where the data were replayed to.

NULL value: -

–

Name: *orid*

Relation: **assoc centryd emodel fplane moment netmag origerr origin predarr predmech stamag alarms eids qgrid**

Description: Each origin is assigned a unique positive integer which identifies it in a data base. The orid is used to identify one of the many hypotheses of the actual location of the event.

NULL value: -1

Range: orid > 0

–

Name: *original_endtime*

Relation: **wfdisc_tshift**

Description: the original time found in the wfdisc record before correction.

NULL value: 9999999999.99900

Units: Seconds

–

Name: *original_samprate*

Relation: **wfdisc_tshift**

Description: original samprate before time correction

NULL value: -1.0000000

Units: 1/seconds

Range: original_samprate >= 0.0

–

Name: *original_time*

Relation: **arrival_tshift wfdisc_tshift**

Description: the original endtime found in the wfdisc record before correction.

NULL value: -9999999999.99900

Units: Seconds

–

Name: *ounits*

Relation: **stage**

Description: This is the output units which are appropriate for the stage. For a seismometer the output units will be V, for a analog-to-digital converter the output units will be counts.

NULL value: -

–

Name: *outdev*

Relation: **dmcseed**

Description: Output device where file was sent.

NULL value: -

–

Name: *param*

Relation: **changed**

Description: This indicates what parameter changed at the station/chan: calib packet "nominal" sample rate

NULL value: -

Range: param =~ /c|r|s|t/

–

Name: *paxazm*

Relation: **fplane moment**

Description: Compression Axis Azimuth and Plunge; In fplane, as determined. In moment, obtained by rotation of the largestt positve eigenvalue. In degrees, for conventions see Aki & Richards (1980).

NULL value:

–

Name: *paxplg*

Relation: **fplane moment**

Description: Compression Axis Azimuth and Plunge; In fplane, as determined. In moment, obtained by rotation of the largestt positve eigenvalue. In degrees, for conventions see Aki & Richards (1980).

NULL value:

–

Name: *paxval*

Relation: **moment**

Description: Length of Compressional Axis Vector; Obtained by rotation of the moment tensor into the principal axes system. Units given by mexpon (which see).

NULL value:

–

Name: *pc_1*

Relation: **gsnspec**

Description: 1 percentile of acceleration specta in dB relative to 1 ((m/sec**2)**2)/Hz

NULL value: -999.000

–

Name: *pc_25*
Relation: **gsnspec**
Description: 25 percentile of acceleration specta in dB relative to 1 ((m/sec**2)**2)/Hz

NULL value: -999.000

–
Name: *pc_5*
Relation: **gsnspec**
Description: 5 percentile of acceleration specta in dB relative to 1 ((m/sec**2)**2)/Hz

NULL value: -999.000

–
Name: *pc_50*
Relation: **gsnspec**
Description: 50 percentile of acceleration specta in dB relative to 1 ((m/sec**2)**2)/Hz

NULL value: -999.000

–
Name: *pdcc*
Relation: **deployment**
Description: Name of primary data collection center for station (AZ, SCECDC, NCEDC, IRIS DMC,...)

NULL value: -

–
Name: *per*
Relation: **arrival**
Description: This attribute is the period of the signal described by the arrival record.

NULL value: -1.00
Units: Seconds
Range: per > 0.0

–
Name: *perdac*
Relation: **calwf**
Description: This is the digitizer calibrator DAC period parameter in seconds that is sent to the digitizer for certain calibration sequences.

NULL value: 0.00000
Units: seconds
Range: perdac > 0.0

–

Name: *perf*
Relation: **chanperf netperf**
Description:
NULL value: -1.00
Range: perf >= 0 && perf <= 100.

–
Name: *period*
Relation: **gsnspec latency**
Description: This is the period in seconds over which measurments are taken and saved into the table.

NULL value: -89999999999
Units: seconds

–
Name: *phase*
Relation: **assoc specdisc stamag**
Description: This field holds the identity of a seismic phase which has been associated to an event. Standard seismological labels for phases are used (e.g., P, PKP, PcP, pP, etc.). Both upper and lower case letters are available and should be used when appropriate, for example, pP or PcP. See iphase.

NULL value: -

–
Name: *phchan*
Relation: **digitizer dlcalwf dlchannel**
Description: This integer is the physical channel number within a digitizer.

NULL value: 999

–
Name: *pktid*
Relation: **retransmit**
Description: Each packet in an orb ring buffer has a unique packet id

NULL value: -1
Range: pktid >= 0

–
Name: *ppower*
Relation: **fkgrid**
Description: This is the observed peak beam power normalized relative to single station power.

NULL value: -1.0000
Range: ppower >= 0.0

–

Name: *preamp*

Relation: **q730b**

Description: This string identifies whether or not a digitizer contains a preamp board yes - yes, it does no - no, it does not

NULL value: -

Range: preamp =~ /yes|no/

–

Name: *preampgain*

Relation: **q730b**

Description: This number expresses the gain of the preamp.

NULL value: 0.000

–

Name: *prefor*

Relation: **event**

Description: This attribute holds the origin identifier, orid, that points to the preferred origin for a seismic event.

NULL value: -1

Range: prefor > 0

–

Name: *probtype*

Relation: **wfedit**

Description: Each wfedit record is assigned an eight character string identifying the alleged problem associated with the specified waveform data.

NULL value: -

–

Name: *provider*

Relation: **comm dlsite**

Description: This is a brief textual description that would allow specifications like: Hughes, Verizon, SBC, etc.

NULL value: -

–

Name: *pva*

Relation: **wfmgme**

Description: This is the measure of the peak absolute value of the vector acceleration for a 3-component sensor.

NULL value: -9.000000e+99

Units: mg

Range: pva >= 0.0

–

Name: *pvv*

Relation: **wfmgme**

Description: This is the measure of the peak absolute value of the vector velocity for a 3-component sensor.

NULL value: -9.000000e+99

Units: nm/sec

Range: pvv >= 0.0

–

Name: *q330sn*

Relation: **balerlist**

Description: q330 serial number

NULL value: -

–

Name: *qdlat*

Relation: **qgrid**

Description: The qdlat field specifies the spacing of the dbgme qgrid along meridians, in radial degrees.

NULL value: -999.000000

Range: qdlat > 0

–

Name: *qdlon*

Relation: **qgrid**

Description: The qdlon field specifies the spacing of the dbgme qgrid across meridians in radial degrees.

NULL value: -999.000000

Range: qdlon > 0

–

Name: *qgridfmt*

Relation: **qgrid**

Description: The qgridfmt field specifies the format of the externally- stored qgrid file. Currently the main format is 'raw' indicating a file of network-byte-order, double-precision floating point grid values

NULL value: -

–

Name: *qgridname*

Relation: **qgrid**

Description: The qgridname field is intended to summarize the configuration of a particular grid. This is used to keep grids unique, which may have overlapping time

periods but different geographical areas or intent.

NULL value: -

–

Name: *qgridtype*

Relation: **qgrid**

Description: This field describes the type of ground-motion measurement contained in a qgrid, for example pga, pgv, mmi (for Peak Ground Acceleration, Peak Ground Velocity, and Modified Mercali Intensity, respectively). While this

information may be implicit from the units and should be implicit from the recipe name, the explicit specification aids applications that may use several different ground-motion measures for the same hypocenter or time window.

NULL value:

–

Name: *qual*

Relation: **arrival**

Description: This single-character flag is used to denote the sharpness of the onset of a seismic phase. This relates to the timing accuracy as follows: i (impulsive) - accurate to +/ 0.2 seconds e (emergent) - accuracy between +/ (0.2 to 1.0 seconds) w (weak) - timing uncertain to > 1 second.

NULL value: -

Range: qual =~ /i|e|w/

–

Name: *radamp*

Relation: **predmech**

Description: A source has a body wave radiation pattern whose predicted magnitude is to be stored in this field. Because it is a radiation pattern effect it should be scaled from 0 to 1. This is useful for conventional focal mechanism, but less useful for moment tensor solutions.

NULL value: -1.0000000

Units: nondimensional

Range: 1.0 >= amp >= 0.0

–

Name: *rake1*

Relation: **fplane moment**

Description: Slip of First and Second Nodal Planes; In degrees (for sign conventions see Aki and Richards, 1980, p. 106). In fplane, as determied. In moment, refers to best-fitting double couple (see bestdc).

NULL value:

–

Name: *rake2*

Relation: **fplane moment**

Description: Slip of First and Second Nodal Planes; In degrees (for sign conventions see Aki and Richards, 1980, p. 106). In fplane, as determied. In moment, refers to best-fitting double couple (see bestdc).

NULL value:

–

Name: *rayleigh*

Relation: **specdisc**

Description: This parameter is relevant for multitaper spectra which have well defined properties in terms of the time-bandwidth product and this parameter. The rayleigh bin size differs from the number of delta frequency when zero padding is used or when the time series are tapered. Rayleigh bins are determined by the

of actual length of the time series and the time-bandwidth product of the taper while the number of frequency interval size is dependent upon the amount of zero padding used.

NULL value: -1

Units: Hertz

Range: rayleigh > 0.0

–

Name: *rcurrent*

Relation: **q730b**

Description: This number expresses the series resistance in ohms of the fixed resistor used in calibrator DAC output circuit during current mode calibrations.Note that this does not include the sensor cal coil impedence.

NULL value: -1.000000e+00

Units: ohm

–

Name: *recipe*

Relation: **beam qgrid**

Description: This is the name of a recipe that was used for data processing, such as to compute a beam.

NULL value: -

–

Name: *recipient*

Relation: **alarmcomm**

Description: This message records a recipient of an email alarm.

NULL value: -

–

Name: *rect*

Relation: **arrival**

Description: This attribute is a measure of signal rectilinearity. The value is obtained from polarization analysis of 3-component data.

NULL value: -1.000

Range: rect >= 0.0 && rect <= 1.0

–

Name: *refsta*

Relation: **fkgrid site stgrid**

Description: This string specifies the reference station with respect to which array members are located. See deast, dnorth.

NULL value: -

–

Name: *remark*

Relation: **remark**

Description: This single line of text is an arbitrary comment about a record in the database. The comment is linked to its parent relation only by forward reference from commid in the tuple of the relation of interest. See commid and lineno.

NULL value: -

–

Name: *review*

Relation: **origin stassoc**

Description: This indicates the level of review for an origin. A value of "y" indicates the origin has been inspected. Higher levels of review indicate a higher degree of confidence in the location. Typical levels might be "auto" or null for

automatic (no human review) locations, "pre"liminary and "fin"al.

NULL value: -

–

Name: *rfdamp*

Relation: **q730b**

Description: This number expresses the series resistance in ohms of the fixed damping shunt resistor.

NULL value: -1.000000e+00

Units: ohm

–

Name: *rms*

Relation: **wfrms**

Description: This is the root-mean-square value of a time segment of (optionally) filtered waveform data.

NULL value: -9.000000e+99

Range: rms >= 0.0

–

Name: *rpreamp*

Relation: **q730b**

Description: This number expresses the series resistance in ohms of the preamplifier."

NULL value: -1.000000e+00

Units: ohm

–

Name: *rrdgraphname*

Relation: **rrdgraph**

Description: The rrdgraphname field lists the name of a type of graph for a round-robin database

NULL value:

–

Name: *rrdvar*

Relation: **rrdcache rrdgraph**

Description: The rrdvar field lists the name of a variable used in a round-robin database

NULL value:

–

Name: *rsettings*

Relation: **q730b**

Description: This integer contains a bitmap of the normal default calibrator relay settings. These are the settings that should be in effect whenever the digitizer is in its normal operational mode with no active calibration sequences. The bits are mapped as follows (bit 0 is LSB): bits bank 0-3 bank 0 (bit 0 -> relay 0, etc.) 4-7 bank 1 8-11 bank 2 12-15 bank 3 16-19 bank 4 20-23 bank 5

NULL value: -1

–

Name: *rspcmp*

Relation: **calresult sensorcal**

Description: This string identifies how a measured response function compares to a nominal response function; nn - no nominal value ok - comparison within acceptable limits oor - comparison out of range

NULL value: -

–

Name: *rsprm*

Relation: **specdisc**

Description: This flag indicates whether the instrument response was removed from the spectra ('y') or not ('n') ;

NULL value: -

Range: rsprm =~ /y|n/

–

Name: *rsptype*

Relation: **instrument specdisc calresult nominalresp seismometer sensorcal**

Description: Originally, this field characterized the response information specified by the neighboring attribute dir and dfile. However, in Antelope datasets, it is used to indicate the "natural" units for the instrument -- ie, 'A' (acceleration),

NULL value: -

–

Name: *rterm*

Relation: **q730b**

Description: This number expresses the series resistance in ohms of the termination resistor.

NULL value: -1.000000e+00

Units: ohm

–

Name: *runtime*

Relation: **calresult sensorcal**

Description: This refers to the actual time when a particular processing function was executed.

NULL value: 9999999999.99900

Units: Epochal seconds

–

Name: *rvdampmax*

Relation: **q730b**

Description: This number expresses the series resistance in ohms of the variable damping resistor when set to its maximum value (corresponding to a count of 255).

NULL value: -1.000000e+00

Units: ohm

–

Name: *rvdampmin*

Relation: **q730b**

Description: This number expresses the series resistance in ohms of the variable damping resistor when set to its minimum value (corresponding to a count of 0).

NULL value: -1.000000e+00

Units: ohm

–

Name: *rvfdamp*

Relation: **q730b**

Description: This number expresses the series resistance in ohms of the fixed variable damping shunt resistor.

NULL value: -1.000000e+00

Units: ohm

–

Name: *samprate*

Relation: **calibration instrument stage wfdisc wftape wftar calresult digitizer dlcalwf dlchannel dmcwf nominalresp seismometer sensorcal wfsrb**

Description: This attribute is the sample rate in samples/second. In the instrument relation this is specifically the nominal sample rate, not accounting for clock drift. In wfdisc, the value may vary slightly from the nominal to reflect clock drift.

Some special channels, like log channels, have this set to zero.

NULL value: -1.0000000

Units: 1/seconds

Range: samprate >= 0.0

–

Name: *scalib*

Relation: **specdisc**

Description: Scale factor of this spectral file required to convert spectra to unspecified standard units. Included to allow individual spectral codes to not worry heavily about scaling.

NULL value: 0

Range: scalib > 0.0

–

Name: *sdcc*

Relation: **deployment**

Description: Name of secondary data collection center for station (AZ, SCECDC, NCEDC, IRIS DMC,...)

NULL value: -

–

Name: *sdepth*

Relation: **origerr**

Description: This is the maximum error of a depth estimate for a level of confidence given by conf. See smajax, sminax, stx.

NULL value: -1.0000

Units: Kilometers

Range: sdepth >= 0.0

–

Name: *sdobs*

Relation: **origerr**

Description: This attribute is derived from the discrepancies in the arrival times of the phases used to locate an event. It is defined as the square root of the sum of the squares of the time residuals, divided by the number of degrees of freedom. The latter is the number of defining observations (ndef in origin) minus the dimension of the system solved (4 if depth is allowed to be a free variable, 3 if depth is constrained).

NULL value: -1.0000

Range: sdobs > 0.0

–

Name: *seaz*

Relation: **assoc predarr**

Description: This attribute is calculated from the station and event locations. It is measured clockwise from North.

NULL value: -999.00

Units: Degrees

Range: seaz >= 0.0 && seaz < 360.0

–

Name: *seed_class*

Relation: **b051 b059**

Description: A single letter code, assigned by the user, that determines to what the code refers.

NULL value:

–

Name: *seed_comment*

Relation: **b051 b059**

Description: Station operators, data collection centers and data management centers can add descriptive comments to data to indicate problems encountered or special situations.

NULL value:

–

Name: *seed_units*

Relation: **b051 b059**

Description: The basic unit name, formatted as FORTRAN like equations. (Db2sd converts this to all caps to conform to SEED requirements.) Use parentheses sparingly, only when normal FORTRAN precedence would not be correct. Use standard exponential notation (eg, 1e-9", not "1*10**-9") for powers of 10. Use SI units and their standard SI abbreviations (but capitalized) whenever possible; spell out and do not abbreviate non-SI units.

NULL value:

–

Name: *segtype*

Relation: **calibration wfdisc wfrms wftape wftar dmcwf wfsrb**

Description: Originally, this attribute indicated if a waveform were o(original), v(virtual), s(segmented) or d(duplicate). However, in Antelope datasets, it indicates the "natural" units of the detector -- 'A' (acceleration), 'V' (velocity), 'D' (displacement), 'I' (infrasound), or 'H' (hydroacoustic), and more recently a host of other non-seismic measurements.

segtype units type of data A nm/sec/sec acceleration B 25 mw/m/m UV (sunburn) index (NOAA) D nm displacement H pascal hydroacoustic I pascal infrasound J watts power (Joules/sec) (UCSD) K kilopascal generic pressure (UCSB) M millimeters Wood-Anderson drum recorder P millibar barometric pressure R millimeters rain fall (UCSD) S nm/m strain T seconds time V nm/sec velocity W watts/m/m insolation a degrees azimuth b bits/second bit rate c counts dimensionless integer d meters depth or height (e.g., water) f micromoles/s/m/m photoactive radiation flux h pH hydrogen ion concentration i amperes electric current m bitmap dimensionless bitmap n nanoradians angle (tilt) o milligrams/liter dilution of oxygen (Mark VanScoy) p percent percentage r inches rainfall (UCSD) s meter/second speed (e.g., wind) t degrees_Celsius temperature u microsiemens/cm conductivity v volts electric potential w radians/second rotation rate

NULL value: -

Range: segtype =~ /A|B|D|H|I|J|M|P|R|S|T|V|W|a|b|c|d|f|h|i|m|n|o|p|r|s|t|u|v|x/

–

Name: *semax*

Relation: **fkgrid**

Description: This is a maximum east-west slowness range.

NULL value: -9.9999

Units: Seconds/km

Range: semax > -9.9999 && semax <= 9.9999

–

Name: *semin*

Relation: **fkgrid**

Description: This is a minimum east-west slowness range.

NULL value: -9.9999

Units: Seconds/km

Range: semin > -9.9999 && semin <= 9.9999

–

Name: *sensortype*

Relation: **seismometer sensormodel**

Description: This string identifies what a sensor measures; D - displacement V - velocity A - acceleration

NULL value:

–

Name: *siteimagetype*

Relation: **sitephotos**

Description: This field is intended to show the general category of site image. While the field is free-form, it is expected that several standard categories will be used, for example 'sensor', 'vault', 'surroundings, 'field crew' etc.

NULL value: -

–

Name: *slo*

Relation: **beam fkgrid**

Description: This is the observed slowness of a wave as it sweeps across an array or the slowness used to compute a beam.

NULL value: -1.0000

Units: Seconds/km

Range: slo >= 0.0

–

Name: *slodef*

Relation: **assoc**

Description: This one-character flag indicates whether or not the slowness of a phase is d (defining), or n (non-defining) for the origin associated with this arrival. See azdef and timedef.

NULL value: -

Range: slodef =~ /d|n/

–

Name: *slores*

Relation: **assoc**

Description: This attribute gives the difference between an observed slowness and a theoretical prediction. The prediction is calculated for the related phase and event origin described in the record.

NULL value: -999.00

Units: Seconds/degree

–

Name: *slow*

Relation: **arrival predarr**

Description: This is the observed slowness of a wave as it sweeps across an array.

NULL value: -1.00

Units: Seconds/degree

Range: slow >= 0.0

–

Name: *slowd*

Relation: **fkgrid**

Description: This is the observed slowness width of the peak lobe in a slowness grid.

NULL value: -1.0000

Units: Seconds/km

Range: slowd >= 0.0

–

Name: *smajax*

Relation: **origerr**

Description: This is the length of the semi-major axis of the location error ellipse. It is found by projecting the covariance matrix onto the horizontal plane. The level of confidence is specified by conf. See sdepth, sminax and stx.

NULL value: -1.0000

Units: Kilometers

Range: smajax > 0.0

–

Name: *smax*

Relation: **stgrid**

Description: This is a maximum slowness range.

NULL value: -9.9999

Units: Seconds/km

Range: smax > -9.9999 && smax <= 9.9999

–

Name: *smin*

Relation: **stgrid**

Description: This is a minimum slowness range.

NULL value: -9.9999

Units: Seconds/km

Range: smin > -9.9999 && smin <= 9.9999

–

Name: *sminax*

Relation: **origerr**

Description: This is the length of the semi-minor axis of the location error ellipse. It is found by projecting the covariance matrix onto the horizontal plane. The level of confidence is specified by conf. See sdepth, smajax and stx.

NULL value: -1.0000

Units: Kilometers

Range: sminax > 0.0

–

Name: *snet*

Relation: **snetsta deployment dlcalwf dlchannel latency netperf**

Description: This is a network code from SEED. It may need to be combined with a station code to form a unique key in local databases.

NULL value: -

–

Name: *sngcmp*

Relation: **sensorcal**

Description: This string identifies how a measured sngen value compares to a nominal value; nn - no nominal value ok - comparison within acceptable limits hi - comparison greater than maximum acceptable limit lo - comparison less than minimum acceptable limit

NULL value: -

–

Name: *sngen*

Relation: **sensorcal sensormodel**

Description: This is the sensor generator gain that relates output voltage to sensor shaking. The units are nominally V/cm/sec for a velocity sensor but can also be V/cm, for a displacement sensor, or V/sm/sec**2 for an acceleration sensor.

NULL value: 0

Units: V/cm/sec

Range: sngen > 0.0

–

Name: *sngenerr*

Relation: **sensorcal**

Description: This number expresses the percentage error of a measured sngen value to a nominal sngen value.

NULL value: -1.000

Units: %

–

Name: *snident*

Relation: **dlsensor sensorcal**

Description: This is the serial number of a sensor that should be unique across sensors of a particular model.

NULL value: -

–

Name: *snmax*

Relation: **fkgrid**

Description: This is a maximum north-south slowness range.

NULL value: -9.9999

Units: Seconds/km

Range: snmax > -9.9999 && snmax <= 9.9999

–

Name: *snmin*

Relation: **fkgrid**

Description: This is a minimum north-south slowness range.

NULL value: -9.9999

Units: Seconds/km

Range: snmin > -9.9999 && snmin <= 9.9999

–

Name: *snmodel*

Relation: **dlsensor sensorcal sensormodel**

Description: This string identifies a sensor model.

NULL value:

–

Name: *snname*

Relation: **calibration**

Description: sensor selected within dbbuild

NULL value: -

–

Name: *snr*

Relation: **arrival detection detev**

Description: This is an estimate of the size of the signal relative to that of the noise immediately preceding it.

NULL value: -1

Range: snr > 0.0

–

Name: *snrpva*

Relation: **wfmgme**

Description: This is an estimate of the size of the signal relative to that of the noise for the pva measurement.

NULL value: -1.00

Range: snrpva > 0.0

–

Name: *snrpvv*

Relation: **wfmgme**

Description: This is an estimate of the size of the signal relative to that of the noise for the pvv measurement.

NULL value: -1.00

Range: snrpvv > 0.0

–

Name: *snrwa*

Relation: **wfmgme**

Description: This is an estimate of the size of the signal relative to that of the noise for the wa measurement.

NULL value: -1.00

Range: snrwa > 0.0

–

Name: *specfmt*

Relation: **specdisc**

Description: This attribute describes the format of the spectra file. The intent is to have two allowable values: fap2 - which are the ascii files used by the response library this format allows for representations of spectra with non-constant df.

binary - assumes that the spectra file is stored as real numbers This format may be useful when calculating huge numbers of spectra. No specific I/O routines exist for this yet.

fap2 format is the only one implemented at present.

NULL value: -

Range: specfmt =~ /fap2/

–

Name: *spectype*

Relation: **specdisc**

Description: This attribute describes the type of estimate the file associated with this relation points to. Valid types anticipated at this revision include: sp1c - power spectrum estimate from single component sp3c - total power estimate from 3 components asp1c - amplitude spectrum estimate from single component asp3c - total amplitude estimate from 3 components clow - lower confidence limit chi - upper confidence limit low - lower bound of ensemble of spectral estimates high - upper bound of ensemble of spectral estimates 1_4 - lower quartile of ensemble 3_4 - upper quartile of ensemble response - response spectrum estimate from single component

NULL value:

–

Name: *srcid*

Relation: **detection**

Description: This is the orb source name assigned by the program that writes packets to the orbserver. The convention used for "srcid" is something like NET_STA/TYPE.

NULL value: -

–

Name: *srn*

Relation: **origin sregion**

Description: This is a seismic region number, as given by Flinn, Engdahl and Hill (Bull. Seism. Soc. Amer. vol 64, pp 791-992, 1974). See grn, grname and srname.

NULL value: -1

Range: srn > 0

–

Name: *srname*

Relation: **sregion**

Description: This attribute is the common name of a seismic region, as given in Flinn, Engdahl and Hill (Bull. Seism. Soc. Amer., vol 64, pp 771-992, 1974). Names may have changed due to changing political circumstances (e.g., old RHODESIA = new ZIMBABWE). See srn and grname.

NULL value: -

–

Name: *ssident*

Relation: **stage digitizer dlacq dlcalwf dlchannel dlsite q330comm q730b seismometer**

Description: This is the serial number of the sensor, the software revision level, or other identifier.

NULL value: -

–

Name: *sta*

Relation: **achanaux affiliation anetsta arrival assoc calibration fkgrid schanloc sensor site sitechan snetsta specdisc stage stamag stassoc stgrid wfdisc wfedit wfmeas wfrms wftape wftar b051 b059 calresult calwf changed chanperf comm deployment detection detev digitizer dmcwf gap gps gsnspec latency nominalresp ratechange replayed retransmit rrdcache rrdgraph seismometer sensorcal sitephotos stanotes trigger wfmgme wfoffset wfsrb**

Description: This is the common code-name of a seismic observatory. Generally only three or four characters are used.

NULL value: -

–

Name: *stageid*

Relation: **stage**

Description: The ordered stage number of this discrete stage in the calibration response. Each individual stage corresponds to a sensor, analog filter, A/D converter, or FIR filter. The numbering scheme for a seismic system will generally assign stageid=1 for the sensor, stageid=2 for the anti-alias filter, stageid=3 for the analog-to-digital converter, stageid=4 for the first FIR filter, ...

NULL value: -1

Range: 0 < stageid

–

Name: *staname*

Relation: **site**

Description: This is the full name of the station whose code-name is in sta. As an example, one record in the site relation connects sta = ANMO to staname = ALBUQUERQUE, NEW MEXICO (SRO).

NULL value: -

–

Name: *stassid*

Relation: **arrival stassoc**

Description: The wavetrain from a single event may be made up of a number of arrivals. A unique stassid joins those arrivals believed to have come from a common event as measured at a single station. Stassid is also the key to the stassoc relation, which contains additional signal measurements not contained within the arrival relation, such as station magnitude estimates and computed signal characteristics.

NULL value: -1

Range: stassid > 0

–

Name: *state*

Relation: **detection trigger**

Description: This indicates if a detection is turning "on" or "off".

NULL value: -

Range: state =~ /ON|OFF|on|off|P|S|D1|D2|D3/

–

Name: *statype*

Relation: **site**

Description: This character string specifies the station type. Recommended entries are ss (single station) or ar (array). For autodrm, the only allowed values are 1C = single component 3C = three component hfa = high-frequency array lpa = long period array

NULL value: -

Range: statype =~ /ss|ar|1C|3C|hfa|lpa/

–

Name: *stddev*

Relation: **latency**

Description: This is the standard deviation in seconds for packet latency for this channel over the associated period.

NULL value: -89999999999

Units: seconds

–

Name: *stime*

Relation: **origerr**

Description: This attribute denotes the time uncertainty that accompanies the location. The level of confidence is specified by conf. See smajax, sminax, and sdepth.

NULL value: -1.00

Units: Seconds

Range: stime >= 0.0

–

Name: *str1*

Relation: **fplane moment**

Description: Strike of First Nodal Plane; In degrees (for sign conventions see Aki and Richards, 1980, p. 106). In fplane, as determied. In moment, refers to best-fitting double couple (see bestdc).

NULL value:

–

Name: *str2*

Relation: **fplane moment**

Description: Strike of Second Nodal Plane; In degrees (for sign conventions see Aki and Richards, 1980, p. 106). In fplane, as determied. In moment, refers to best-fitting double couple (see bestdc).

NULL value:

–

Name: *straddle*

Relation: **wfdisc_tshift**

Description: In principle, a wfdisc time shift should probably not straddle time correction point(s), but should fall within one period (between 2 time points). set to y if this wfdisc record straddles a time shift boundary.

NULL value: -

Range: straddle =~ /y|n/

–

Name: *stray*

Relation: **retransmit**

Description: "retransmitted" packets have data which overlaps previous data, or are so out of order that they are not used in the database. packet is just out of order. overlapped a previous packet's time range, rather than exactly duplicating it. This probably indicates a problem with the datalogger. discarded.

NULL value: -

Range: stray =~ /d|n|o|r/

–

Name: *stream*

Relation: **calibration dlchannel**

Description: The data stream identification number. Many dataloggers with internal digital signal processors can generate multiple data streams with different filtering and and/or sample rates using the same sensor as an input. This number is used in the calibration relation.

NULL value: -1

–

Name: *strike*

Relation: **origerr**

Description: This attribute is the strike of the semi-major axis of the location error ellipse, measured in degrees clockwise from North. See smajax.

NULL value: -1.00

Units: Degrees

Range: strike >= 0.0 && strike < 360.0

–

Name: *stt*

Relation: **origerr**

Description: This is an element of the covariance matrix for the location identified by orid. The covariance matrix is symmetric (and positive definite) so that sxy = syx, etc., (x,y,z,t) refer to latitude, longitude, depth and origin time, respectively. These attributes (together with sdobs, ndef and dtype) provide all the information necessary to construct the K-dimensional (K=2,3,4) confidence ellipse or ellipsoids at any confidence limit desired.

NULL value: -999999999.9999

Units: seconds squared,

Range: stt >= 0.0

–

Name: *stx*

Relation: **origerr**

Description: This is an element of the covariance matrix for the location identified by orid. The covariance matrix is symmetric (and positive definite) so that sxy = syx, etc., (x,y,z,t) refer to latitude, longitude, depth and origin time, respectively. These attributes (together with sdobs, ndef and dtype) provide all the information necessary to construct the K-dimensional (K=2,3,4) confidence ellipse or ellipsoids at any confidence limit desired.

NULL value: -999999999.9999

Units: kilometer-second

–

Name: *sty*

Relation: **origerr**

Description: This is an element of the covariance matrix for the location identified by orid. The covariance matrix is symmetric (and positive definite) so that sxy = syx, etc., (x,y,z,t) refer to latitude, longitude, depth and origin time, respectively. These attributes (together with sdobs, ndef and dtype) provide all the information necessary to construct the K-dimensional (K=2,3,4) confidence ellipse or ellipsoids at any confidence limit desired.

NULL value: -999999999.9999

Units: kilometer-second

–

Name: *stype*

Relation: **arrival wfrms**

Description: This single-character flag indicates the event or signal type. The following event types are defined: l (local), r (regional), t (teleseismic), m (mixed or multiple), g (glitch), c (calibration activity upsets the date). l, r, and t are supplied by the reporting station, or as an output of post detection processing. g and c come from analyst comment or from the status bits from GDSN and RSTN data. stype is also used in the wfrms table to indicate signal (s) or noise (n)

NULL value: -

Range: stype =~ /l|r|t|m|g|c|s|n|1|2|3/

–

Name: *stz*

Relation: **origerr**

Description: This is an element of the covariance matrix for the location identified by orid. The covariance matrix is symmetric (and positive definite) so that sxy = syx, etc., (x,y,z,t) refer to latitude, longitude, depth and origin time, respectively. These attributes (together with sdobs, ndef and dtype) provide all the information necessary to construct the K-dimensional (K=2,3,4) confidence ellipse or ellipsoids at any confidence limit desired.

NULL value: -999999999.9999

Units: kilometer-second

–

Name: *subject*

Relation: **alarms**

Description: This message records the subject line of an email alarm sent out.

NULL value: -

–

Name: *sxx*

Relation: **origerr**

Description: This is an element of the covariance matrix for the location identified by orid. The covariance matrix is symmetric (and positive definite) so that sxy = syx, etc., (x,y,z,t) refer to latitude, longitude, depth and origin time, respectively. These attributes (together with sdobs, ndef and dtype) provide all the information necessary to construct the K-dimensional (K=2,3,4) confidence ellipse or ellipsoids at any confidence limit desired.

NULL value: -999999999.9999

Units: kilometers squared,

Range: sxx >= 0.0

–

Name: *sxy*

Relation: **origerr**

Description: This is an element of the covariance matrix for the location identified by orid. The covariance matrix is symmetric (and positive definite) so that sxy = syx, etc., (x,y,z,t) refer to latitude, longitude, depth and origin time, respectively. These attributes (together with sdobs, ndef and dtype) provide all the information necessary to construct the K-dimensional (K=2,3,4) confidence ellipse or ellipsoids at any confidence limit desired.

NULL value: -999999999.9999

Units: kilometers squared,

–

Name: *sxz*

Relation: **origerr**

Description: This is an element of the covariance matrix for the location identified by orid. The covariance matrix is symmetric (and positive definite) so that sxy = syx, etc., (x,y,z,t) refer to latitude, longitude, depth and origin time, respectively. These attributes (together with sdobs, ndef and dtype) provide all the information necessary to construct the K-dimensional (K=2,3,4) confidence ellipse or ellipsoids at any confidence limit desired.

NULL value: -999999999.9999

Units: kilometers squared,

–

Name: *syy*

Relation: **origerr**

Description: This is an element of the covariance matrix for the location identified by orid. The covariance matrix is symmetric (and positive definite) so that sxy = syx, etc., (x,y,z,t) refer to latitude, longitude, depth and origin time, respectively. These attributes (together with sdobs, ndef and dtype) provide all the information necessary to construct the K-dimensional (K=2,3,4) confidence ellipse or ellipsoids at any confidence limit desired.

NULL value: -999999999.9999

Units: kilometers squared,

Range: sxx >= 0.0

–

Name: *syz*

Relation: **origerr**

Description: This is an element of the covariance matrix for the location identified by orid. The covariance matrix is symmetric (and positive definite) so that sxy = syx, etc., (x,y,z,t) refer to latitude, longitude, depth and origin time, respectively. These attributes (together with sdobs, ndef and dtype) provide all the information necessary to construct the K-dimensional (K=2,3,4) confidence ellipse or ellipsoids at any confidence limit desired.

NULL value: -999999999.9999

Units: kilometers squared,

–

Name: *szz*

Relation: **origerr**

Description: This is an element of the covariance matrix for the location identified by orid. The covariance matrix is symmetric (and positive definite) so that sxy = syx, etc., (x,y,z,t) refer to latitude, longitude, depth and origin time, respectively. These attributes (together with sdobs, ndef and dtype) provide all the information necessary to construct the K-dimensional (K=2,3,4) confidence ellipse or ellipsoids at any confidence limit desired.

NULL value: -999999999.9999

Units: kilometers squared,

Range: sxx >= 0.0

–

Name: *tagid*

Relation: **wftag**

Description: This contains the value of a foreign key identified in tagname. For example, if tagname is 'arid', then wftag may be joined to arrival where arrival. arid = wftag. tagid. If tagname is 'orid', then wftag and origin may be joined where origin. orid = wftag. tagid.

NULL value: -1

Range: tagid > 0

–

Name: *tagname*

Relation: **specdisc wftag changed detection gap ratechange retransmit trigger**

Description: This is the name of the foreign key whose value is in tagid.

NULL value: -

Range: tagname =~ /arid|evid|orid|stassid/

–

Name: *tapeblock*

Relation: **wftape**

Description: This attribute gives the first block (in some file of an ANSI-labeled tape) at which a time series begins. The dearchiving program uses this number to skip blocks within a tape file in order to retrieve the waveform specified. See tapefile.

NULL value: -1

Range: tapeblock > 0

–

Name: *tapefile*

Relation: **wftape**

Description: This attribute gives the file number (on a tape) at which a time-series is written. A tape begins with file 1. This number can be used to skip files when retrieving data from the tape. See tapeblock.

NULL value: -1

Range: tapefile > 1

–

Name: *tapename*

Relation: **wftar dmcseed**

Description: This gives the tape volume label information.

NULL value: -

–

Name: *taper*

Relation: **specdisc**

Description: Descriptive word describing taper method applied to time-series before fft used to estimate this spectral file. e.g. boxcar, 4pi-prolate, gaussian, cos-squared, 10%-cos, etc.

NULL value: -

–

Name: *target*

Relation: **balerlist**

Description: q3302orb target name which is acquiring dlname station data.

NULL value: -

–

Name: *taxazm*

Relation: **fplane moment**

Description: Tension Azis Azimuth and Plunge; In fplane, as determined. In moment, obtained by rotation of the moment tensor into the principal axes system. Associated with the largest (in the absolute sense) negative eigenvalue. In degrees, for conventions see Aki & Richards (1980).

NULL value:

–

Name: *taxplg*

Relation: **fplane moment**

Description: Tension Azis Azimuth and Plunge; In fplane, as determined. In moment, obtained by rotation of the moment tensor into the principal axes system. Associated with the largest (in the absolute sense) negative eigenvalue. In degrees, for conventions see Aki & Richards (1980).

NULL value:

–

Name: *taxval*

Relation: **moment**

Description: Length of Tension Axis Vector; Obtained by rotation of the moment tensor into the principal axes system. Units given by mexpon. See also taxval, taxazm.

NULL value:

–

Name: *tbp*

Relation: **specdisc**

Description: This parameter is relevant for multitaper spectra which have well defined properties in terms of the time-bandwidth product. Other spectral estimates would set this value null

NULL value: -1.0

Range: tbp > 0.0

–

Name: *tend*

Relation: **sensorcal**

Description: Epochal time given as seconds and fractions of a second since hour 0 January 1, 1970, and stored in a double precision floating number. Refers to the ending time of a processing time window.

NULL value: -9999999999.99900

Units: Seconds

–

Name: *tfile*
Relation: **wftar**
Description: tapename/tfile specifies a tape-file number-archive file name for a tar archive waveform.

NULL value: -

–
Name: *tfoff*
Relation: **wftar**
Description: This is the byte offset of a waveform segment within a tar data file. It is used when data are multiplexed.

NULL value: 0
Range: foff >= 0

–
Name: *tgap*
Relation: **gap**
Description: This is the length of time data was missing for a station.

NULL value: -9999999999999.99
Units: Seconds

–
Name: *thr*
Relation: **q330comm**
Description: Current Q330 throttle rate.

NULL value: -1
Range: thr > 0

–

Name: *time*

Relation: **arrival calibration fkgrid origin predarr sensor specdisc stage stassoc stgrid wfdisc wfedit wfmeas wfrms wftape wftar alarmcomm alarms arrival_tshift b051 b059 balerlist calresult calwf changed chanperf comm deployment detection detev digitizer dlacq dlcalwf dlchannel dlevent dlsensor dlsite dmcwf eids gap gps gsnspec latency netperf nominalresp q330comm q730b qgrid ratechange replayed retransmit rrdcache rrdgraph seismometer sensorcal sitephotos stanotes trigger wfdisc_tshift wfmgme wfoffset wfsrb**

Description: Epochal time given as seconds and fractions of a second since hour 0 January 1, 1970, and stored in a double precision floating number. Refers to the relation data object with which it is found. E.g., in arrival - arrival time; in origin - origin time; in wfdisc, - start time of data. Where date of historical events is known, time is set to the start time of that date; where the date of contemporary arrival measurements is known but no time is given, then the time attribute is set to the NA value. The double-precision floating point number allows 15 decimal digits. At 1 millisecond accuracy this is a range of 3 years. Where time is unknown, or prior to Feb. 10, 1653, set to the NA value.

NULL value: -9999999999.99900

Units: Seconds

–

Name: *time0*

Relation: **trigger**

Description: In trigger, this attribute is the trigger time for an event. All arrivals for this event should come after this time.

NULL value: 9999999999.99900

Units: Epochal seconds

–

Name: *timecentryd*

Relation: **centryd**

Description: Epoch time. Epochal time given as seconds and fractions of a second since hour 0 January 1, 1970, and stored in a double precision floating number. Refers to the relation data object with which it is found. E.g., in arrival - arrival time; in origin - origin time; in wfdisc, - start time of data. Where date of historical events is known, time is set to the start time of that date; where the date of contemporary arrival measurements is known but no time is given, then the time attribute is set to the NA value. The double-precision floating point number allows 15 decimal digits. At 1 millisecond accuracy this is a range of 3 years. Where time is unknown, or prior to Feb. 10, 1653, set to the NA value.

NULL value: -9999999999.999

Units: Seconds

–

Name: *timedef*

Relation: **assoc**

Description: This one character flag indicates whether the time of a phase is d (defining), or n (non-defining) for this arrival. See azdef and slodef.

NULL value: -

Range: timedef =~ /d|n/

–

Name: *timeres*

Relation: **assoc**

Description: This attribute is a travel time residual, measured in seconds. The residual is found by taking the observed arrival time (saved in the arrival relation) of a seismic phase and subtracting the expected arrival time. The expected arrival time is calculated by a formula based on earth velocity model (attribute vmodel), an event location and origin time (saved in table origin), the distance to the station (attribute dist in table assoc), and the particular seismic phase (attribute phase in table assoc).

NULL value: -999.000

Units: Seconds

–

Name: *timever*

Relation: **dmcwf**

Description: Time of verification data in record when compared to external database or reference. Generally used for data synchronization. Verification time given as seconds and fractions of a second since hour 0 January 1, 1970, and stored in a double precision floating number.

NULL value: -9999999999.99900

Units: Seconds

–

Name: *tmeas*

Relation: **wfmeas**

Description: Epoch time of a discrete measurement made on waveform data

NULL value: -9999999999.99900

Units: Seconds

–

Name: *tmnlpb*

Relation: **centryd**

Description: Minimum period used in mantle wve inversion. The cut-off period of the low pass flter app;oed before inversion. in seconds.

NULL value:

–

Name: *tmnmw*

Relation: **centryd**

Description: The cut-off period of the low pass filter applied before inversion. In seconds.

NULL value:

–

Name: *totbytes*

Relation: **dmcseed**

Description: This is the size of a data file in bytes.

NULL value: -1

Range: totbytes >= 0

–

Name: *totdur*

Relation: **specdisc**

Description: This parameter is relevant for Welsh averaged spectra . For multitaper spectral estimates would set this value to twin or null.

NULL value: -1.00

Range: totdur > 0.0

–

Name: *trecov*

Relation: **calwf**

Description: This is a time pad between when a particular calibration function ends and when the calibrator relays are reset to their pre-calibration state.

NULL value: 0.00000

Units: seconds

Range: recov > 0.0

–

Name: *troff*

Relation: **detev**

Description: In detev, this attribute is the time relative to the "time" attribute for the detection OFF state.

NULL value: 99999.99999

Units: seconds

–

Name: *tron*

Relation: **detev**

Description: In detev, this attribute is the time relative to the "time" attribute for the detection ON state.

NULL value: -99999.99999

Units: seconds

–

Name: *trpva*

Relation: **wfmgme**

Description: In wfmgme, this attribute is the time relative to the "time" attribute for the pva measurement.

NULL value: -99999.99999

Units: seconds

–

Name: *trpvv*

Relation: **wfmgme**

Description: In wfmgme, this attribute is the time relative to the "time" attribute for the pvv measurement.

NULL value: -99999.99999

Units: seconds

–

Name: *trwa*

Relation: **wfmgme**

Description: In wfmgme, this attribute is the time relative to the "time" attribute for the wa measurement.

NULL value: -99999.99999

Units: seconds

–

Name: *tsettle*

Relation: **calwf**

Description: This is a time pad between when the calibrator relays are enabled and when a particular calibration function starts.

NULL value: 0.00000

Units: seconds

Range: tsettle > 0.0

–

Name: *tshift*

Relation: **sensor**

Description: This attribute is designed to accommodate discrepancies between actual time and the numerical time written by data recording systems. Actual time is the sum of the reported time plus tshift.

NULL value: 0.00

Units: Seconds

–

Name: *tstart*

Relation: **sensorcal**

Description: Epochal time given as seconds and fractions of a second since hour 0 January 1, 1970, and stored in a double precision floating number. Refers to the starting time of a processing time window.

NULL value: -9999999999.99900

Units: Seconds

–

Name: *twin*

Relation: **fkgrid specdisc stgrid wfmeas wfrms**

Description: This is a time window in seconds.

NULL value: 0.00

Range: twin > 0.0

–

Name: *uncertainty*

Relation: **netmag stamag**

Description: This is the standard deviation of the accompanying magnitude measurement.

NULL value: -1.00

Range: uncertainty > 0.0

–

Name: *units*

Relation: **calibration specdisc qgrid**

Description: This is the units which the calibration are measured. Normally the units are nm for displacement data, nm/sec for velocity data, nm/sec**2 for acceleration data.

NULL value: -

–

Name: *units1*

Relation: **wfmeas**

Description: This is a description of the units for a measurement on a waveform

NULL value: -

–

Name: *units2*

Relation: **wfmeas**

Description: This is a description of the units for a measurement on a waveform

NULL value: -

–

Name: *val1*

Relation: **wfmeas**

Description: This is a measured value on a waveform. The interpretation and units depend on the type of measurement.

NULL value:

–

Name: *val2*

Relation: **wfmeas**

Description: This is a measured value on a waveform. The interpretation and units depend on the type of measurement.

NULL value:

–

Name: *valoffset*

Relation: **wfoffset**

Description: This field gives the constant-offset value, in user units (i.e. with calib already applied), which must be added to the wfdisc time-series for a given

data stream in order to recover the full-precision, calibrated value.

NULL value: 0

–

Name: *vang*

Relation: **sitechan**

Description: This attribute measures the angle between the sensitive axis of a seismometer and the outward-pointing vertical direction. For a vertically oriented seismometer, vang = 0, or 180 (to reverse the sense of the instrument). For a horizontally oriented seismometer, vang = 90. See hang.

NULL value: -999.9

Units: Degrees

Range: vang >= 0.0 && vang <= 180.0

–

Name: *vd*

Relation: **q730b**

Description: This string identifies whether or not digitizer variable damping is enabled yes - yes, it is no - no, it is not

NULL value: -

Range: vd =~ /yes|no/

–

Name: *vdamprperc*

Relation: **q730b**

Description: This number expresses the series resistance in ohms of the variable damping resistor corresponding to one count.

NULL value: 0.00000000e+00

Units: ohm

–

Name: *vmodel*

Relation: **assoc**

Description: This character string identifies the velocity model of the earth used to compute the travel times of seismic phases. These are required for event location (if phase is defining) or for computing travel-time residuals.

NULL value: -

–

Name: *volname*

Relation: **wftape**

Description: This gives the volume label information for a tape.

NULL value: -

–

Name: *wa*

Relation: **wfmgme**

Description: This is the measure of the peak value from a virtual Wood-Anderson drum recorder.

NULL value: -9.000000e+99

Units: mm

–

Name: *wfid*

Relation: **beam wfdisc wftag wftape wftar wfdisc_tshift wfsrb**

Description: The key field is a unique identifier for a segment of digital waveform data.

NULL value: -1

Range: wfid > 0

–

Name: *wgt*

Relation: **assoc**

Description: This attribute gives the final weight assigned to the allied arrival by the location program. It is used primarily for location programs that adaptively weight data by their residuals.

NULL value: -1.000

Range: wgt >= 0.0 && wgt <= 1.0

–

Name: *yearday*

Relation: **dmcseed**

Description: This attribute is the yearday which is the same as the jdate except it is not dependant on having the filed time in the same relation

NULL value: -1

Range: yearday>1000001 && yearday < 3000001

–