The S87 data format was developed to standardize the handling of ascii station data. The main parts of the S87 format file are the header line containing all pertinent station information, an id line with two character minimum mnemonics describing the data in the columns below and the data, the first two characters being unique.

The first line must be the header line and contain all the information needed to identify the station, as described below:

```
TPPCC SSSS CC SDD.DDDD SDDD.DDDD YY/MM/DD YDA HH:MM  CRUISE_ID
```

T - data type (C: ctd, B: bottle, A: axbt, X: xbt)

PP - NODC platform code

CC - NODC country code of the platform

SSSS - station number

CC - cast number

SDD.DDDD - latitude in decimal degrees (S; sign, + optional)

SDDD.DDDD - longitude in decimal degrees

YY/MM/DD - date, year/month/day

YDA - year-day for year of collection

HH:MM - time, hour:minutes

CRUISE_ID - optional cruise identifier, one word

Following the header line can be an optional secondary header line for other cast information. There may also be an optional line describing important physical characteristics at the station location. This line must begin with the character '&' in the first column. These mnemonics are: CS for PC02 insitu, CL for PC02 at lab T (15 degrees C), TC for total C02, TK for total Alkalinity, ZZ for bottom depth in meters, ZM for distance from bottom, SS for bucket surface salinity, TA for air temperature in degrees C, PA for air pressure in millibars (hectopascals), TS for bucket surface temperature in degrees C, WS for wind speed in meters per second, and WD for wind direction in degrees. Fields are separated by tabs or spaces. A line to denote this would be:

```
&ZZ=4766 TA=-4.2 PA=0990 WS=0.6 WD=122
```

There may be as many comment lines as desired that do not start with an '&' or an '@'. It is suggested that any program used to create or modify an s87 format file add a new line with the date, user name, the program name and the input file name.

The column identification line contains mnemonics of at least two unique characters that identify the data in the columns below. This line must start with an '@' in the first column. A list of present id's is included below. Tabs are used to separate mnemonics and data columns to conserve disk space (it is suggested that the %g format specifier be used when rewriting data to kill trailing 0's).
Regretfully, fortran programs do not accept tabs.

1s	freon-11 saturation (see f1)
2s	freon-12 saturation (see f2)
AG	adiabatic temperature gradient
AN	specific volume anomaly
BU	buffer count
BV	Brunt Vaisalla frequency
C3	delta C-13
C4	Delta C-14
CA	chlorophyll a
CC	total CO2 by gas cromatograph
CL	pCO2 @ lab temperature
CO	conductivity
CS	pCO2 @ insitu temperature
DE	depth (meters)
DF	density flux
DO	delta_oc/delta_t
DR	density ratio
F1	freon 11 (see 1s)
F2	freon 12 (see 2s)
FL	flags (from ctd78 format)
FR	freon ratio
FS	freon saturation
GV	geostrophic velocity
HE	helium
HZ	dynamic height
IT	ice thickness (cm)
LT	percent of light transmitted through water
N2	nitrite (stability)
N3	nitrate (nitrite + nitrate)
NH	ammonia
OC	oxygen current
OS	% oxygen saturation
OT	oxygen temperature
OX	oxygen (ml/l)
PA	air pressure
PH	pH
PO	phosphate
PR	pressure (decibars)
PT	potential temperature
RH	rosette potential temperature (rosette salinity and ctd temp)
RN	record number (bottle number)
RO	rosette oxygen
RP	rosette pressure
RS	rosette salinity
RT	rosette temperature
S0	sigma theta
S1	sigma 1
S2	sigma 2
S3	sigma 3

S4 sigma 4
SA salinity
SE sea state
SI silicate
ST sigma t
SV sound velocity (also VE)
SW swell

T1 tritium (TU)
T2 tritium (TU-81)
TA air temperature
TC total CO2 by titration
TE temperature
TF temperature above freezing
TG temperature gradient
TI time
TK total alkalinity (titration)

VE sound velocity (also SV)

WD wind direction
WE weather
WS wind speed (m/s)

ZM distance off bottom (meters)
ZZ bottom depth (meters)

this file is /turf/ouzel/fizocean/docs/s87.doc

ADDENDUM

The above information was obtained from Lamont-Doherty Earth Institute in 1994. As currently used at SFRI the data format is not strictly S87 format. Several possibly fatal shortcuts have been taken through expedience, ignorance and laziness.

- The records are not strictly kept to 64 columns wide. Records are not padded with blank characters.

- The cruise identifier field in the first record is not always one word.

- The data type FL has been taken away from flags and give to fluorescence.

- The data type LT has been taken to mean the ratio of subsurface light to surface light

- The following additional data types have been used or redefined :

DS -
FL - Fluorescence
FU -
LS - Surface light
LT - Light ratio
LU - Light sensor
MS - Mean salinity
MT - Mean tempoerature
NU - Number of observations
O2 - Oxygen concentration

SC - Scan number
SN - Scan number
TR - Transmittance (transmissometer)
VS - Variance in salinity
VT - Variance in temperature
WO - Wire out

Platform identifiers for South Africa are 91??

91AE - Africana I (unfortunately also been used for the latest Africana)
91AF - Africana II
9191 - Aircraft
91BA - Bellatrix
91BB - Benguela
91DB - Drifting buoy
91FS - Fixed stations
91FR - Fraay R/K
91FH - Frank Harvey
91JG - J.D. Gilchrist
91KU - Kunene
91LT - Lady Theresa
91MN - Meiring Naude
9190 - Multiple ships
91NA - Natal
91PA - Palinurus
91PI - Pickle
91PR - Protea
91RA - RFA
91AA - S.A. Agulhas
91CA - S.A. Constantia
91SG - S.A. Sederberg
91WB - S.A. Waterberg
91SA - Sardinops
91SC - Schipa
91DT - Thomas B. Davie R/V
91TR - Trachurus
9199 - UNKNOWN
91VC - Victory
91VR - Vrystaat

Added: 2000/07/12 CMDR