Entry Procedures 9 - C

These procedures are for entry of data for differential gap of event.

(1) The purpose of these procedures are to enter differential gap with respect to the limit value of event specified with Entry Procedures 5 - 8. For the OFF type of events, these procedures are skipped and the prompter jumps to subsequent entry procedures.

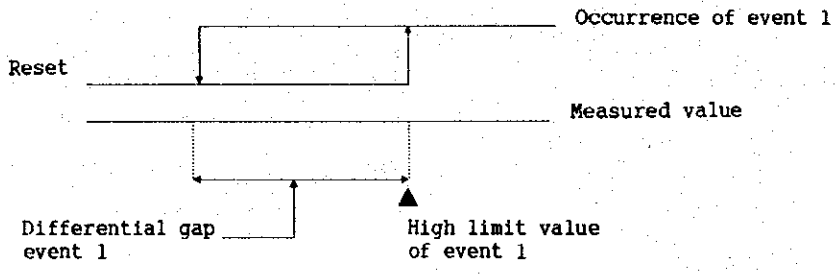
(2) The differential gap is to provide an allowance for resetting of event occurred (event 1 in the below illustration).

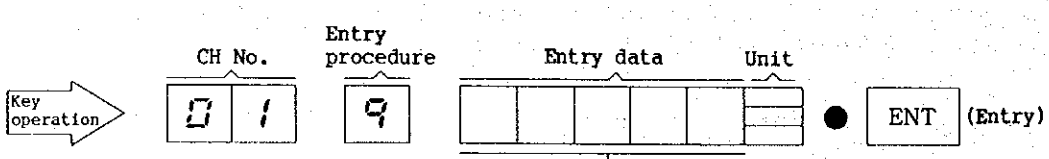
Note: Entry Procedure 9: To specify a differential gap with respect to the limit value of event specified with Entry Procedure 5.

Entry Procedure A: To specify a differential gap with respect to the limit value of event specified with Entry Procedure 6.

Entry Procedure B: To specify a differential gap with respect to the limit value of event specified with Entry Procedure 7.

Entry Procedure C: To specify a differential gap with respect to the limit value of event specified with Entry Procedure 8.





Specify a differental gap (positive value) for event specified with Entry Procedure 5.

(Valid range: 0 to 29999)

Tenkeys

Note: The place of decimal point is determined by the range code, or identical with that of engineering range.

- As you press the [ENT] key, a prompter for proceeding to Entry Procedure 6 will appear on the readout. For Entry Procedures 6 - 8 also, enter data in the same manner as above.

  As you press the [ENT] key when Entry Procedure C is over, event data entry for channel 1 is complete and a prompter for proceeding to Entry Procedure 1 for event data entry for channel 2 will appear on the readout. For channel 2 and subsequent channels, repeat Entry Procedures 1 - C for event data entry.

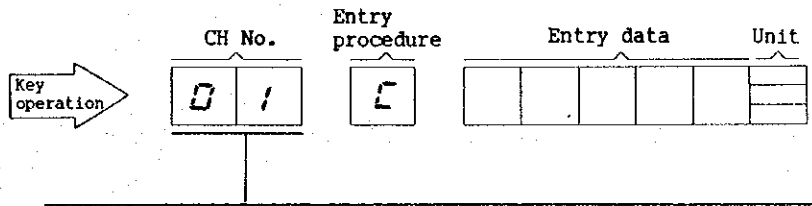
> Note: Configuration data entered for a certain channel can be copied onto other channels to rapidly accomplish configuration data entry. (Refer to Section 8.4.11 "Copying of Configuration Data.")

Key operation → Re-entry Procedure

(1) To modify the data to be entered, move the cursor to the required position with the [◀] and [▶] keys and then modify the data.

(2) To modify the data which has been entered by pressing the [ENT] key with Entry Procedures 9 - B, return to the preceding entry procedure by pressing the [SHIFT] and [ENT] keys and then modify the data with the procedure of (1).

(3) To modify the data which has been entered by pressing the [ENT] key with Entry Procedure C by pressing the keys as mentioned below and then modify the data with the procedure of (1).



- o Move the cursor (blinking column) to the CH No. position with the [◀] key and then press tenkeys [0] and [1].
- o Press the [ENT] key for the required number of times until the prompter Entry Procedure C appears on the readout.

8.4.4 Entry of Tag Name

A tag name can be entered for each channel with Entry Procedures 1 - 8. A prompter to let you follow the procedures in the correct order is displayed at the EVENT section of the readout. A tag name can be given with up to eight characters with hexadecimal data.

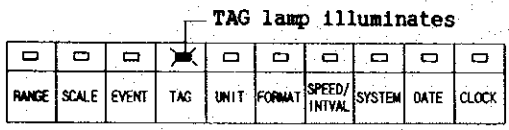
Readout / Item	CH NO.	EVENT		DATA
	8 8	8		8 8 8 8 8
TAG	CH NO.	Entry procedure No. (Prompter No.)	1	1st character
			2	2nd character
			3	3rd character
			4	4th character
			5	5th character
			6	6th character
			7	7th character
			8	8th character

Key Operation Before Starting Data Entry Procedures

(1) Selecting the "TAG" Mode

Key operation

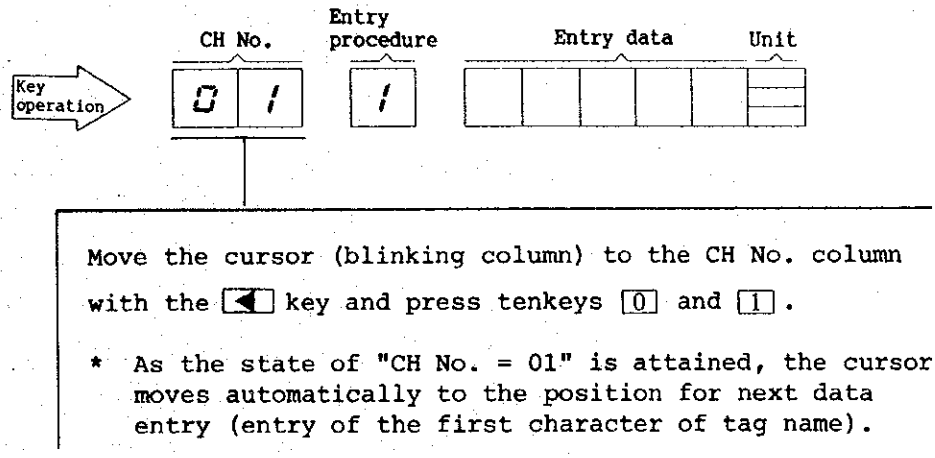
Press the DATA SET key to select the "TAG" mode. The corresponding data entry status lamp (TAG lamp) will illuminate.



(2) Selecting a Channel

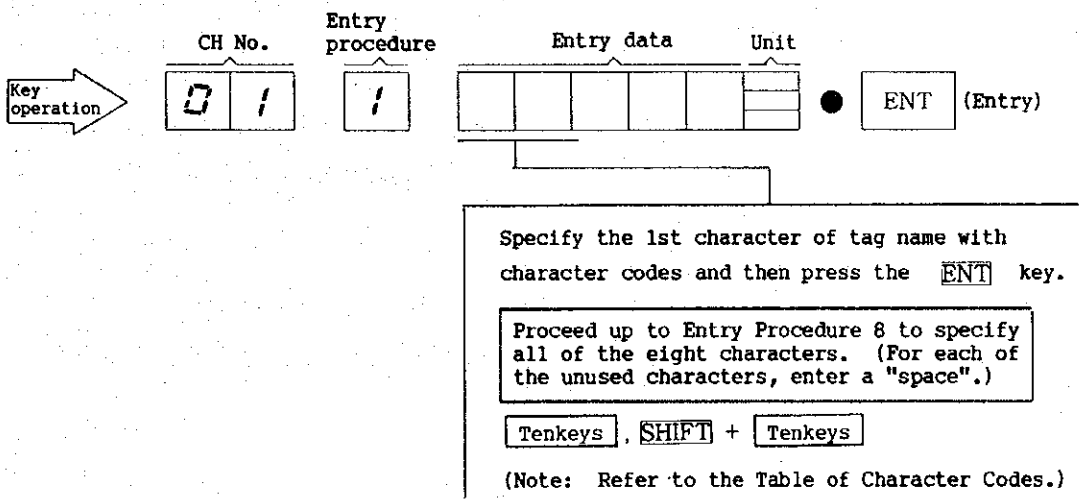
Select a channel number for data entry. (Channel No. 01 is assumed here.)

- If the channel number displayed on the readout is 01, go to Entry Procedure 1 which follows.
- If the channel number displayed on the readout is not 01, modify it to 01 with the following procedure:



Entry Procedures 1 - 8

(1) These procedures are for entry of a tag name (tag number) which can be printed out for each channel on the recording chart paper. Each tag name can be given with eight characters.



- As you press the ENT key, a prompter for proceeding to Entry Procedure 2 will appear on the readout. Execute Entry Procedures 2 - 8 to enter data for all of the eight characters.

  As you press the ENT key when Entry Procedure 8 is over, tag name entry for channel 1 is complete and a prompter for proceeding to Entry Procedure 1 for tag data entry for channel 2 will appear on the readout. For channel 2 and subsequent channels, repeat Entry Procedures 1 - 8 for tag name entry.

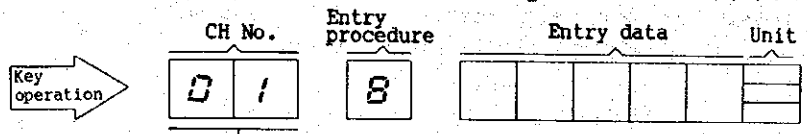
Note: Configuration data entered for a certain channel can be copied onto other channels to rapidly accomplish configuration data entry. (Refer to Section 8.4.11 "Copying of Configuration Data".)

Key operation Re-entry Procedure

(1) To modify the data to be entered, move the cursor to the required position with the ◀ and ▶ keys and then modify the data.

(2) To modify the data which has been entered by pressing the ENT key with Entry Procedures 1 - 7, return to the preceding entry procedure by pressing the SHIFT and ENT keys and then modify the data with the procedure of (1).

(3) To modify the data which has been entered by pressing the ENT key with Entry Procedure 8 by pressing the keys as mentioned below and then modify the data with the procedure of (1).



- o Move the cursor (blinking column) to the CH No. position with the ◀ key and then press tenkeys 0 and 1.
- o Press the ENT key for the required number of times until the prompter Entry Procedure 8 appears on the readout.

Example of Tag Name Entry: Tag Name "TIC-001" for Channel 1

Character order	Tag name	Character code
1	T	54
2	I	49
3	C	43
4	-	2D
5	0	30
6	0	30
7	1	31
8	(BLANK)	20

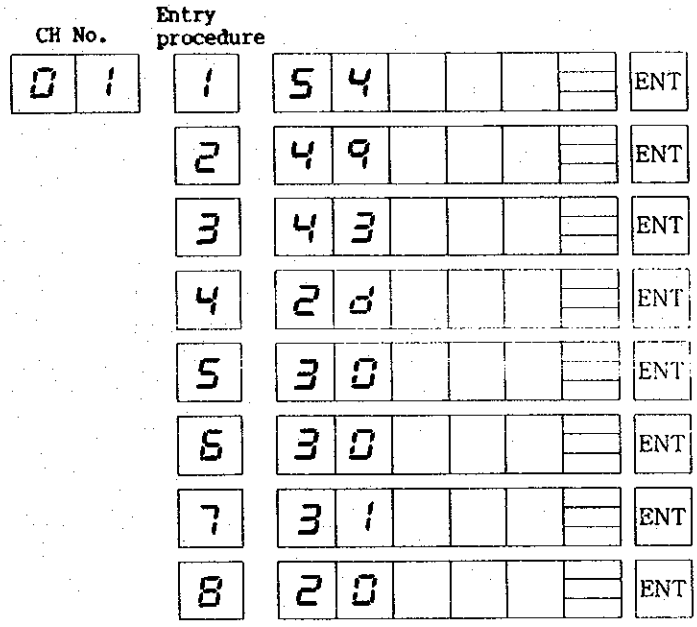


Table of Character Codes

Bottom / Top	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
2		!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
3	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5	P	Q	R	S	T	U	V	W	X	Y	Z	[	¥	]	^	_
6	`	a	b	c	d	e	i	g	h	i	j	k	l	m	n	o
7	p	q	r	s	t	u	v	w	x	y	z	Ω	Ö	μ	[2]	[2]
8	[3]	[3]	[3]	[3]												

8.4.5 Entry of Engineering Unit of Measure

An engineering unit of measure can be specified for each channel with Entry Procedures 1 - 6. The entry procedure numbers (prompter numbers) are automatically displayed at the EVENT section (prompter display section) of the readout. The name for each unit can be given with up to six characters by entering hexadecimal codes.

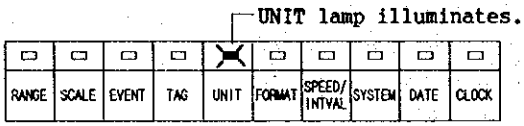
Readout / Item	CH NO.	EVENT		DATA
	8 8	8		8 8 8 8 8
TAG	CH NO.	Entry procedure No. (Prompter No.)	1	1st character
			2	2nd character
			3	3rd character
			4	4th character
			5	5th character
			6	6th character

Key Operation Before Starting Data Entry Procedures

(1) Selecting the "UNIT" Mode

Key operation

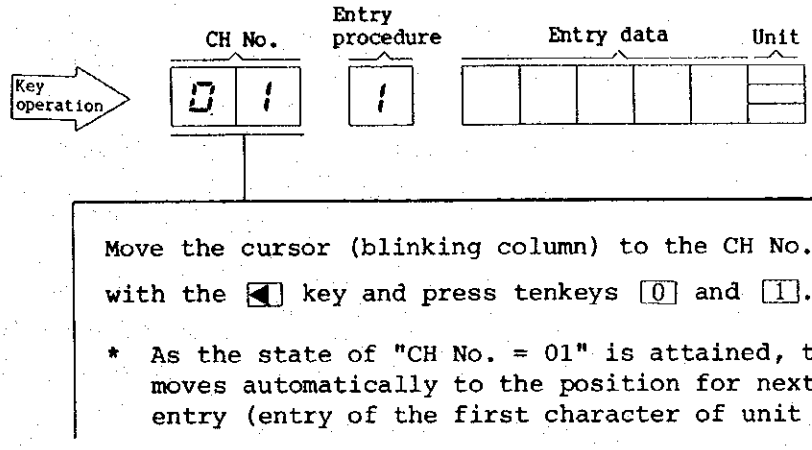
Press the DATA SET key to select the "UNIT" mode. The corresponding data entry status lamp (UNIT lamp) will illuminate.



(2) Selecting a Channel

Select a channel number for data entry. (Channel No. 01 is assumed here.)

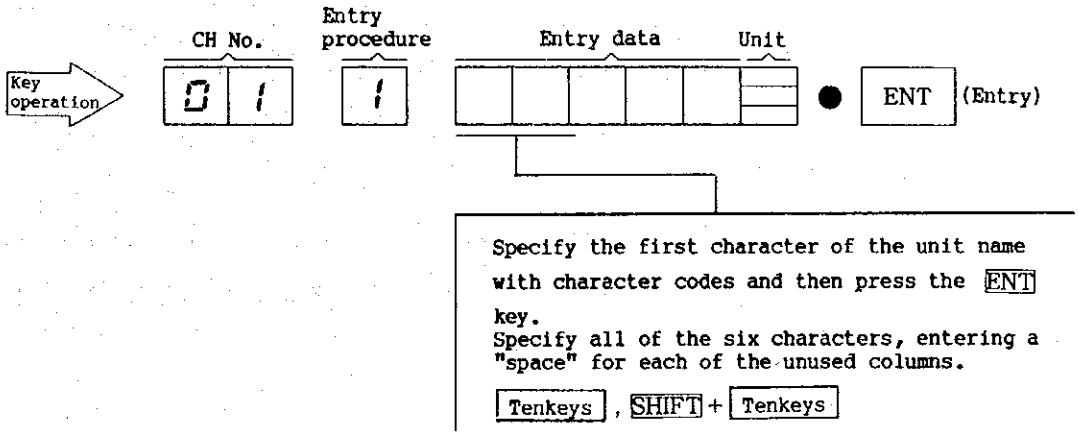
- If the channel number displayed on the readout is 01, go to Entry Procedure 1 which follows.
- If the channel number displayed on the readout is not 01, modify it to 01 with the following procedure:



Entry Procedures 1 - 6

(1) Entry of an engineering unit of measure is effective only for voltage or current input (linear scaling). The entered units can be printed out for respective channels. Each unit name can be given with six characters.

(2) For temperature Inputs, °C is automatically selected for measurement and recording.



- As you press the ENT key, a prompter for proceeding to Entry Procedure 2 will appear on the readout. Enter six characters by executing Entry Procedures 2 - 6 also in the same manner as above.

  As you press the ENT key when Entry Procedure 6 is over,entry for channel 1 is complete and a prompter for Entry Procedure 1 for entry of engineering unit for channel 2 will appear on the readout. Repeat Entry Procedures 1 - 6 for each of the channels.

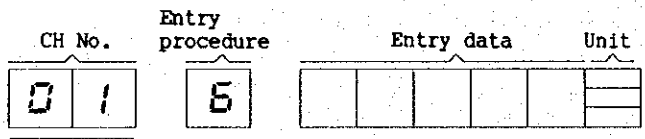
Note: Configuration data entered for a certain channel can be copied onto other channels to rapidly accomplish configuration data entry. (Refer to Section 8.4.11 "Copying of Configuration Data.")

Key operation Re-entry Procedure

(1) To modify the data to be entered, move the cursor to the required position with the ◀ and ▶ keys and then modify the data.

(2) To modify the data which has been entered by pressing the ENT key with Entry Procedures 1 - 5, return to the preceding entry procedure by pressing the SHIFT and ENT keys and then modify the data with the procedure of (1).

(3) To modify the data which has been entered by pressing the ENT key with Entry Procedure 6 by pressing the keys as mentioned below and then modify the data with the procedure of (1).



- o Move the cursor (blinking column) to the CH No. position with the ◀ key and then press tenkeys 0 and 1.
- o Press the ENT key for the required number of times until the prompter Entry Procedure 6 appears on the readout.

Example of Unit Entry: To Enter "kg/cm²" for Channel 1

Character order	Unit of measure	Character code
1	k	6B
2	g	67
3	/	2F
4	C	63
5	m	6D
678	^{2}	7E

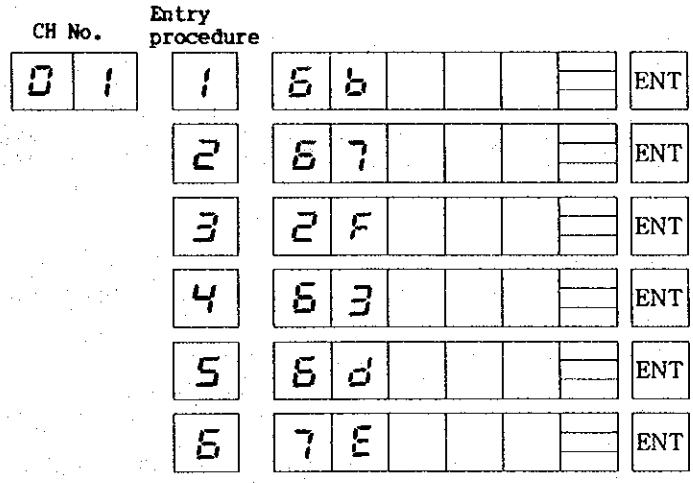


Table of Character Codes

Bottom / Top	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
2		!	"	#	$	%	&	'	(	)	*	+	,	−	.	/
3	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4	ⓐ	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5	P	Q	R	S	T	U	V	W	X	Y	Z	[	¥	]	^	−
6	`	a	b	c	d	e	i	g	h	i	j	k	l	m	n	o
7	p	q	r	s	t	u	v	w	x	y	z	Ω	℧	μ	^{2}	$_2$
8	^{3}	°	$_\circ$	•												

8.4.6 Entry of Recording Format Data

This entry is for selecting one of the three recording format. The recording format is identical for all channels and no channel specifications are required to be entered.

Readout / Item	CH NO.	EVENT	DATA				
	8 8	8	8	8	8	8	8
FORMAT			Recording format *				

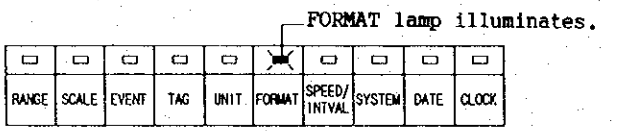
* 1: Trend, 2: Trend + Log, 3: Log

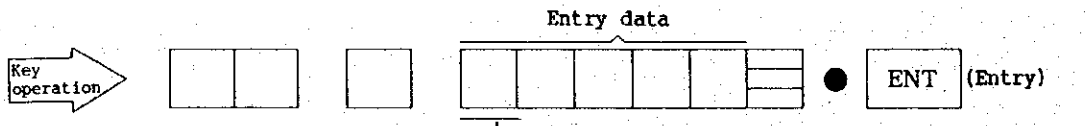
Key Operation Before Starting Data Entry Procedures

(1) Selecting the "FORMAT" Mode

Key operation

Press the DATA SET key to select the "FORMAT" mode. The corresponding data entry status lamp (FORMAT lamp) will illuminate.





Specify a format (1 - 3).

Tenkeys

[1]: Trend: Analog recording plus digital print out of time and scale data

[2]: Trend + Log: Analog recording plus digital logging at every 75 mm interval *1

*1: Printing cycle time differs by the chart speed.

Chart feed speed	Printing cycle time	
12.5 mm/h	Every 6 hours	
25 mm/h	Every 3 hours	75 mm intervals
50 mm/h	Every 1.5 hours	
70 mm/h	Every hour	
150 mm/h	Every hour	150 mm intervals

[3]: Log: Tabulating print out of digital data at certain time intervals *2

*2: Print out intervals are dictated by the interval timer of Section 8.4.7.

Key operation Re-entry Procedure

(1) To modify the entered data, specify the required one of the recording format (1 - 3) and then press the ENT key.

8.4.7 Entry of Chart Feed Speed/Interval Timer Data

Entry of chart feed speed/interval timer data is common for all channels, and can be accomplished by executing Entry Procedures 1 - 4. The entry procedure numbers (prompter numbers) are automatically displayed at the EVENT section (prompter section) of the readout. Irrelevant data entry items are automatically skipped by the prompter.

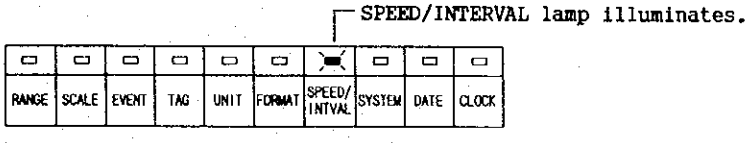
Readout / Item	CH No.	EVENT		DATA		
	8 8	8		8 8 8 8 8		
SPEED/ INTVL		Entry procedure No. (Prompter No.)	1	Chart speed		Chart speed (typical)
			2	Chart speed *1		Chart speed (typical)
			3	Interval timer		Interval timer (typical)
			4	Interval timer *1		Interval timer (typical)

*1: This data entry procedure is effective only for the instrument which is incorporated with the remote-control signal input circuit (optional). For the instrument which is not incorporated with the optional provision circuit, this entry procedure is skipped automatically.

Key Operation Before Starting Data Entry Procedures

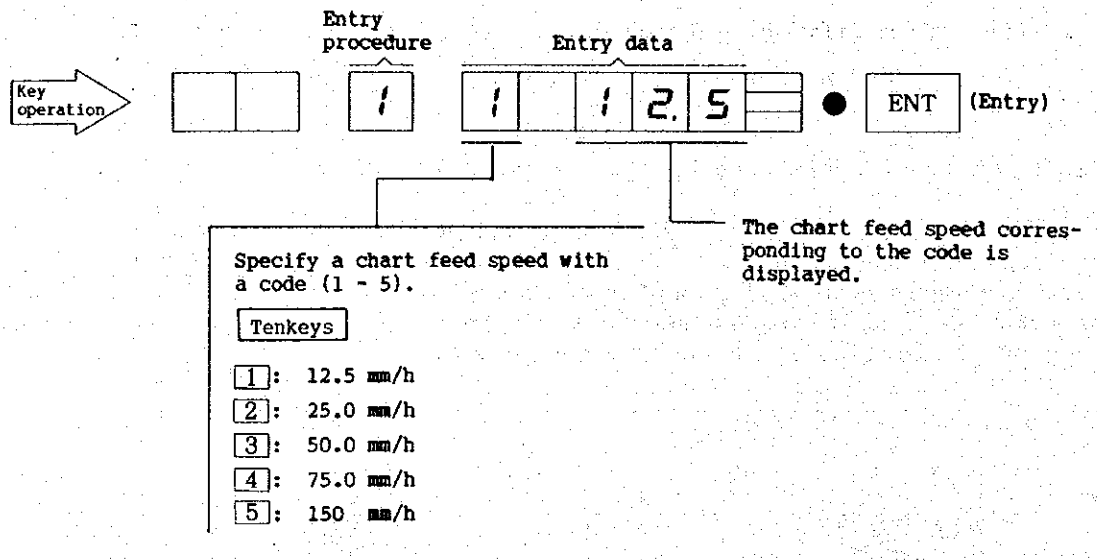
(1) Selecting the "SPEED/INTERVAL" Mode

Key operation Press the DATA SET key to select the "SPEED/INTERVAL" mode. The corresponding configuration data entry Mode lamp (SPEED/INTERVAL lamp) will illuminate.



Entry Procedure 1

This procedure is for entry of data for chart feed speed No. 1.



- As you press the ENT key, a prompter for proceeding to Entry Procedure 2 will appear if the instrument is with the remote control signal input circuit (optional) or that for proceeding to Entry Procedure 3 will appear if the instrument is without the optional circuit.

Key operation → Re-entry Procedure

(1) To modify the entry data, specify the required chart feed speed with the corresponding code (1 - 5).

(2) To modify the data which has been entered by pressing the ENT key, return to the preceding Entry Procedure by pressing the SHIFT and ENT keys and then modify the data with the procedure of (1).

Entry Procedure 2

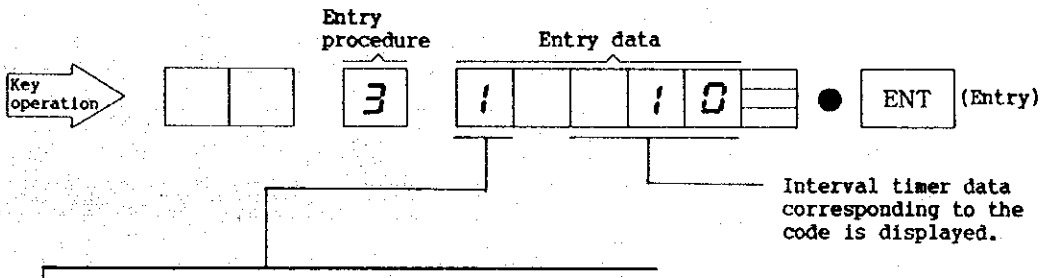
This procedure is for entry of data for chart feed speed No. 2 (optional).

(1) The procedure of data entry is identical with that of Entry Procedure 1.

(2) If the instrument is not provided with the remote control signal input circuit (optional), this procedure is skipped an the prompter for proceeding to Entry Procedure 3 appears on the readout.

Entry Procedure 3

This procedure is for entry of data for interval timer No. 1.



Specify interval timer data with a code (1 - 9).

Tenkeys	(Display)	(Printing occurs with the following timing.)	
1: 10 min	10	XX o'clk 00 min.	Every 10 min., such as XX o'clk 10 min.
2: 20 min	20	XX o'clk 00 min.	Every 20 min., such as XX o'clk 20 min.
3: 30 min	30	XX o'clk 00 min.	Every 30 min., such as XX o'clk 30 min.
4: 1 hr	1h	XX o'clk 00 min.	Every hour on the hour
5: 2 hr	2h	00 o'clk 00 min.	Every 2 hours, such as 2 o'clk 00 min.
6: 3 hr	3h	00 o'clk 00 min.	Every 2 hours, such as 3 o'clk 00 min.
7: 6 hr	6h	00 o'clk 00 min.	Every 2 hours, such as 6 o'clk 00 min.
8: 12 hr	12h	00 o'clk 00 min.	Twice a day (12 o'clk 00 min.)
9: 24 hr	24h	00 o'clk 00 min.	Once a day at 00 o'clk 00 min.

- As you press the ENT key, a prompter for proceeding to Entry Procedure 2 will appear if the instrument is with the remote control signal input circuit (optional) or that for proceeding to Entry Procedure 3 will appear if the instrument is without the optional circuit.

Key operation → Re-entry Procedure

(1) To modify the entry data, specify the required interval timer data with code (1 - 9) and then press the ENT key.

(2) To modify the data which has been entered, call out the required Entry Procedure number (prompter number) and then execute the procedure of (1).

Entry Procedure 4

This procedure is for entry of data for interval timer No. 2 (optional).

(1) The procedure of data entry is identical with that for interval timer No. 1 with Entry Procedure 3.

(2) If the instrument is not incorporated with the remote control signal input circuit (optional), this procedure is skipped and a prompter for returning to Entry Procedure 1 appears on the readout.

8.4.8 Entry of Key Lock Level Data

Keys can be locked to protect against inadvertent or unauthorized pressing. Three levels of key lock are possible. This procedure is to enter data to specify one of these levels.

Item \ Readout	CH No.	EVENT	DATA
	8 8	8	8 8 8 8 8
SYSTEM		1	Key lock level

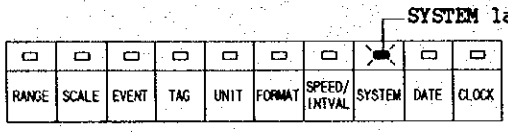
Key Operation Before Starting Data Entry Procedures

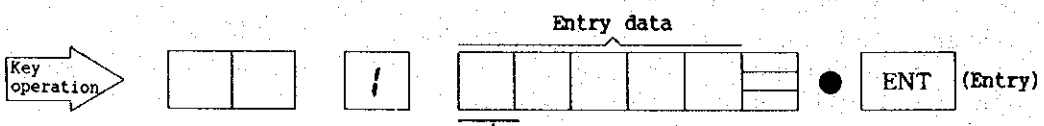
(1) Selecting the "SYSTEM" Mode

Key operation

Press the DATA SET key to select the "SYSTEM" mode.

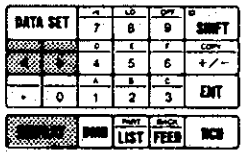
The corresponding configuration data entry status lamp (SYSTEM lamp) will illuminate.



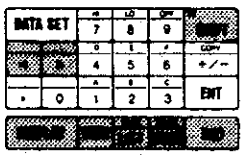


Specify a key lock level (1 - 3).

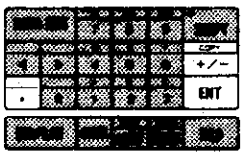
The keys of the shaded sections (■) remains unlocked.

1: 

The keys for display change when in the operation mode and those for channel number change for fixed channel display when in the MAN mode remain unlocked.

2: 

The keys for operation mode remains unlocked, in addition to those which remain unlocked with level 1.

3: 

The keys for event, chart speed/interval timer, and recording format when in the configuration mode remain unlocked, in addition to those which remain unlocked with level 2.

Note: The key lock function is not effected simply by specifying a key lock level. It is effected when the KEY-LOCK key is pressed.

⇨ For details, refer to Section 9 "RUNNING OPERATION."

Key operation → Re-entry Procedure

(1) To modify the entry data, specify the required key lock level (1 - 3) and then press the [ENT] key.

8.4.9 Entry of Date Data

This procedure is to enter that date can be printed out on the recording chart.

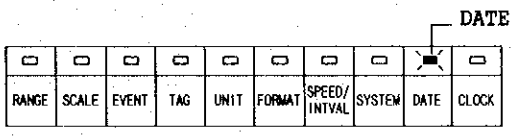
Readout / Item	CH No.	EVENT	DATA				
	8 8	8	8	8	8	8	8
DATE	Year		Month		–	Day	

Key Operation Before Starting Data Entry Procedures

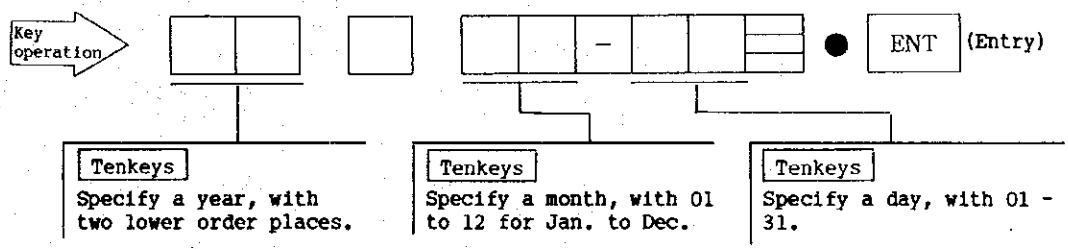
(1) Selecting the "DATE" Mode

Key operation → Press the [DATA SET] key to select the "DATE" mode.

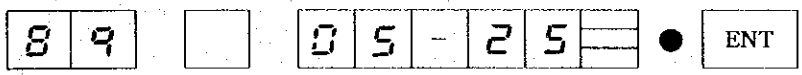
The corresponding configuration entry status lamp (DATE lamp) will illuminate.



Note: As a data item is entered, the cursor automatically moves to the position for the next data item.



Example of date data: "89 05-25" for May 25, '87



Key operation → Re-entry Procedure

(1) To modify the data, move the cursor to the required position with the ◀ and ▶ keys and then enter the required data following the above procedure.

8.4.10 Entry of Time Data

This procedure is to enter time data (or for time synchronization) in order that correct time can be printed out on the recording chart.

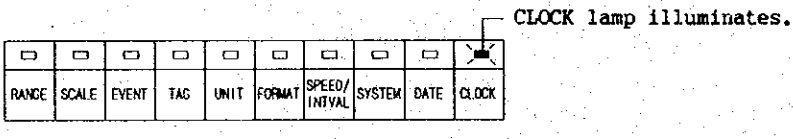
Readout / Item	CH No.	EVENT	DATA				
	8 8	8	8	8	8	8	8
CLOCK			Hour		-	Minute	

Key Operation Before Starting Data Entry Procedures

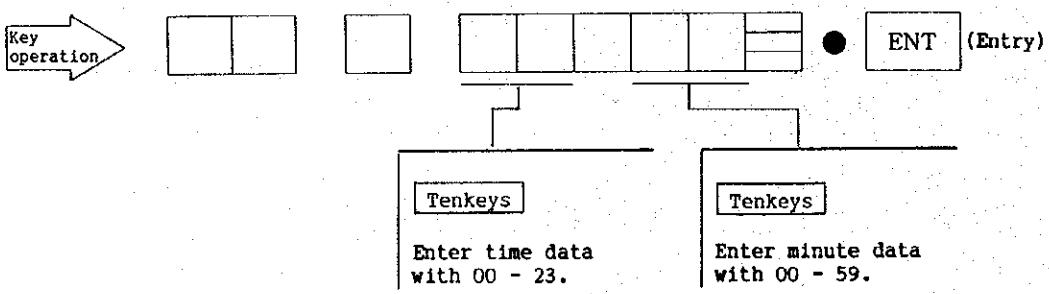
(1) Selecting the "CLOCK" Mode

Key operation

Press the DATA SET key to select the "CLOCK" mode. The corresponding configuration data entry status lamp (CLOCK lamp) will illuminate.

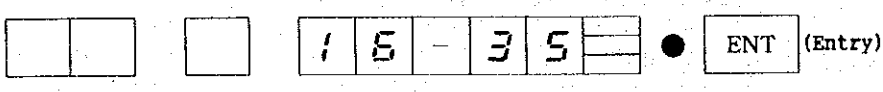


Note: As your enter data for hour, the cursor automatically moves to the next entry position (minute data entry position).



Note: At the instant the ENT key is pressed, second data is reset to 00.

Example of time data entry: 16 o'clock 35 minutes



Key operation

Re-entry Procedure

(1) To modify the data, move the cursor to the required position with the ◀ and ▶ keys and then enter the required data following the above procedure.

8.4.11 Copying of Configuration Data

This function allows to copy, totally or partially, the configuration data of a certain channel onto another channel(s).

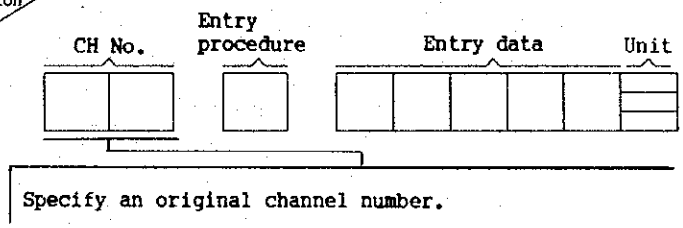
Total Copy

(1) This function allows to copy the entire configuration data (range, recording scale, event, tag, and unit) onto another channel at one time.

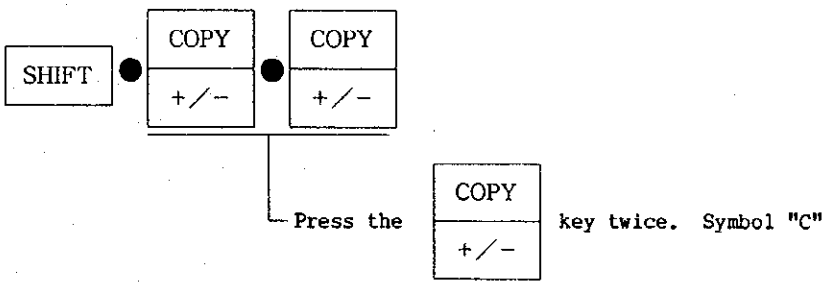
Note: Do not turn off the POWER switch immediately after starting the copying operation. Note that, although other key operation may be made immediately after starting the total copy operation, the total copy operation itself takes about three minutes before it is completed.

Key operation

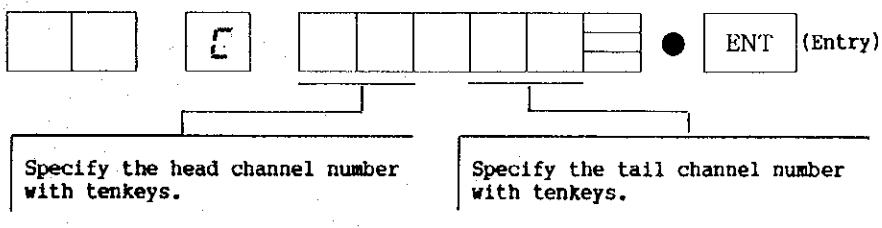
1) Specify a channel number before starting copying.



2) For total copying, proceed as follows:



3) Specify the range of channel.



Note: When the head channel is specified, the tail channel is specified displayed in synchronization with the head channel. The head channel number must be the same with or smaller than the tail channel number.

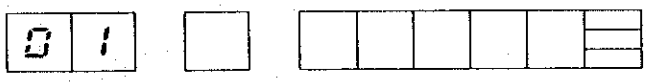
4) To return to the configuration mode:

As you press the COPY / +/- key again, the instrument is reset to the configuration mode which existed before the copy key was pressed.

Example of Total Copy

■ To copy the total configuration data of channel 1 onto channels 2 - 6.

Display the channel number of original channel (channel 1)



If other channel number is being displayed, modify it to channel number 1 by moving the cursor with the ◀ key and pressing tenkeys [0] and [1].

Press the [SHIFT] ● [COPY +/-] ● [COPY +/-] keys to set the instrument into the total copy mode.

Specify channel number 2 by pressing tenkeys [0] and [2].

Specify channel number 6 by pressing tenkeys [0] and [6].

Press the [ENT] key. Total copy will be executed.

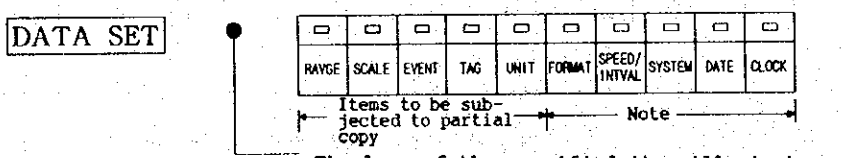
Press the [COPY +/-] key to return to the configuration mode.

Partial Copy

(1) This function allows to copy a certain items of the configuration data of a certain channel onto another channel(s). The items which can be copied in this mode are RANGE, SCALE, EVENT, TAG, and UNIT.

Key operation

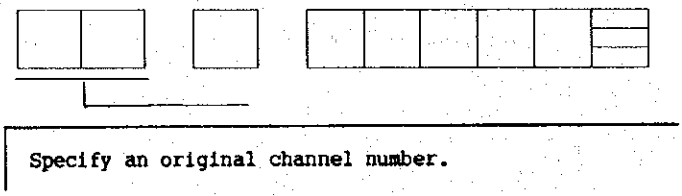
1) Specify the configuration item to be copied, with the [DATA SET] key.



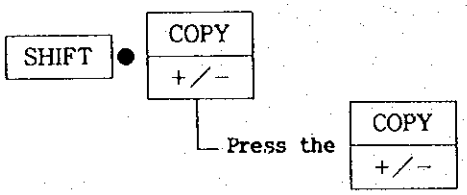
The lamp of the specified item illuminates.

Note: Copying which involves FORMAT, SPEED/INTERVAL, SYSTEM, DATE and CLOCK can be done only in the total copy mode.

2) Specify a channel number before starting copying.

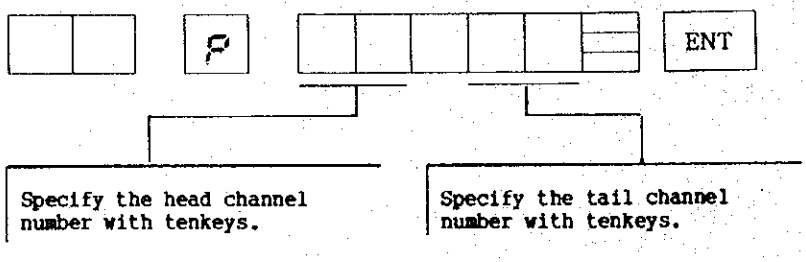


3) For partial copying, proceed as follows:

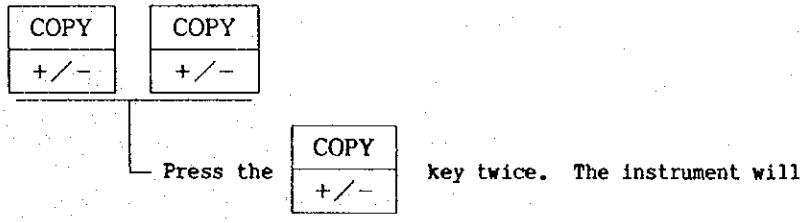


Press the [COPY +/−] key once. Symbol "P" will appear at the EVENT section of the display, indicating that the instrument is in the "partial copy" mode.

4)



5) To return to the configuration mode:

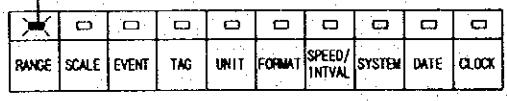


Example of Partial Copy

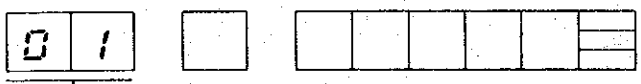
■ To copy the range data of channel 1 onto channels 2 - 6.

(1) Select the "RANGE" mode with the [DATA SET] key.

RANGE lamp illuminates.



(2) Display the channel number of original channel (channel 1)



Of other channel number is being displayed, modify it to channel number 1 by moving the cursor with the ◀ key and pressing tenkeys [0] and [1].

(3) Set the instrument to the "partial copy" mode by pressing the [SHIFT] ● [COPY +/−] keys.

(4) Specify channel number 2 by pressing tenkeys [0] and [2].

(5) Specify channel number 6 by pressing tenkeys [0] and [6].

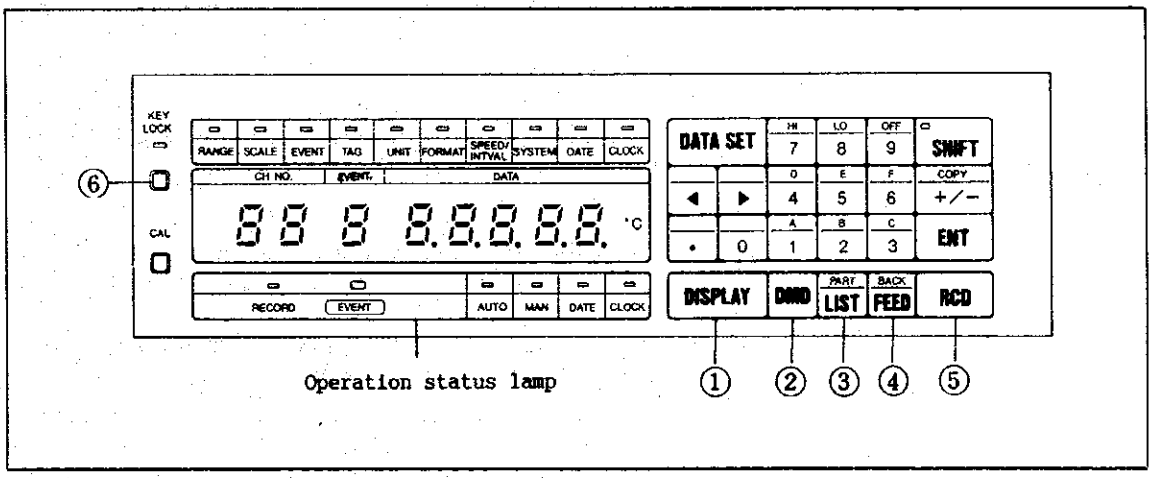
(6) Press the [ENT] key. Partial copy will be executed.

(7) Press the [COPY +/−] ● [COPY +/−] key twice to return to the configuration mode.

9. RUNNING MODE OF OPERATION

9.1 Key Operation

This section describes the key operation procedures when the DPR500 is in the running mode. Set data can be changed even when the DPR500 is in the recording mode of operation.



1) DISPLAY Operation mode display selector key

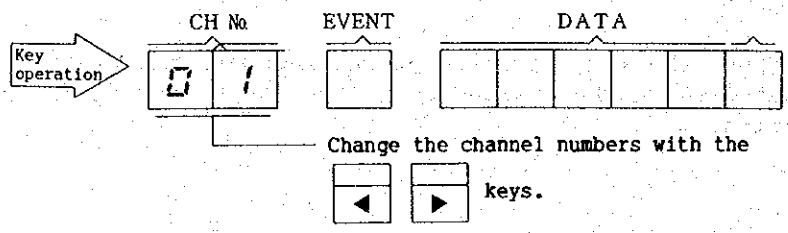
Key operation → DISPLAY

Each time as you press this key, the operation modes are changed in the sequence of → AUTO → MAN → DATE → CLOCK → and the corresponding one of the operation status lamps illuminates. The readout displays the data corresponding to the selected mode.

AUTO: The channel number, event status, PV value (differential value), and unit of each channel are displayed at 4-second intervals, with automatic scanning of all channels.

MAN: The channel number, event status, PV value (differential value), and unit of a manually selected channel are constantly displayed.

To select a channel manually



Note: Recording is omitted for the channel for which the recording mode is set for OFF. Refer to Section 8.4.1 "Entry of Range Data."

DATA: Display of year, month, and day
(Year is with two lower order places.)

CLOCK: Display of time of clock and minutes.
The "–" blinks at every 0.5 sec.

2) DMD Demand record key

Key operation

(1) If you press the DMD key when in the trend recording mode or in the trend recording plus logging mode of operation, the measured data is digitally printed in the logging format, overlapping on the analog record. When printing out the list, all key operations are ignored. If key operation is required, terminate the log print out operation by pressing again the PART/LIST key.

(2) If you press the DMD key when in the log print out operation, logging is terminated and the demand record is done.

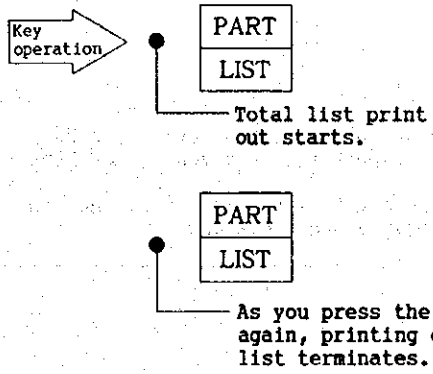
(3) To terminate the demand record, press the DMD key again.

3) PART / LIST List print out key

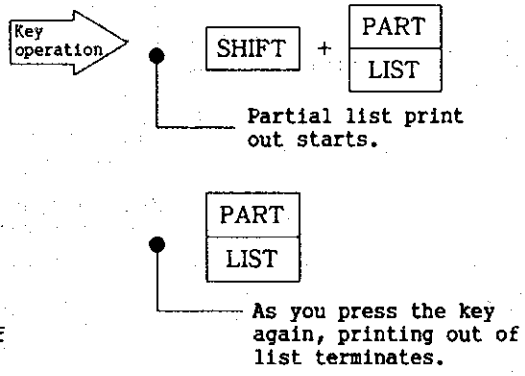
The entered configuration data is printed out, either (1) in a total print out mode or (2) in a partial print out mode (only for items which are frequently changed when in running operation.)

Note: When in the demand record operation, the key entry is ignored. To make the key entry effective, terminate the demand record.

(1) Total list print out



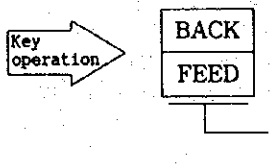
(2) Partial list print out



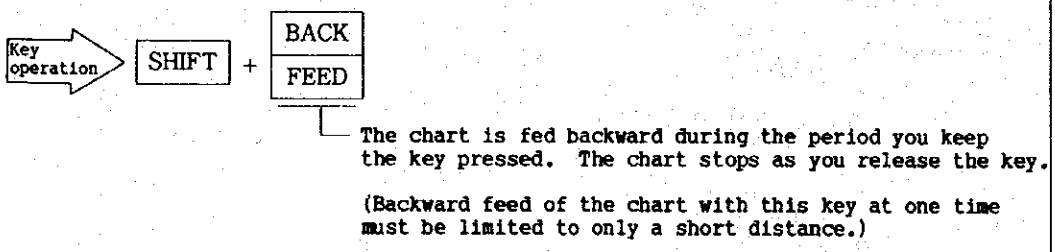
4) BACK / FEED Chart feed key

The chart feed key remains disabled when in demend record print out, total or partial list print out, or recording operation.

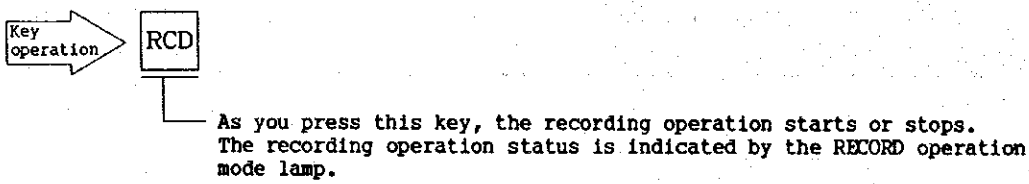
(1) To feed chart forward



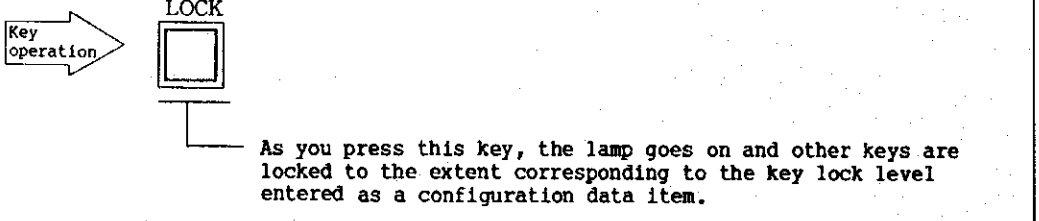
(2) To feed chart backward



5) RCD Record on/off key



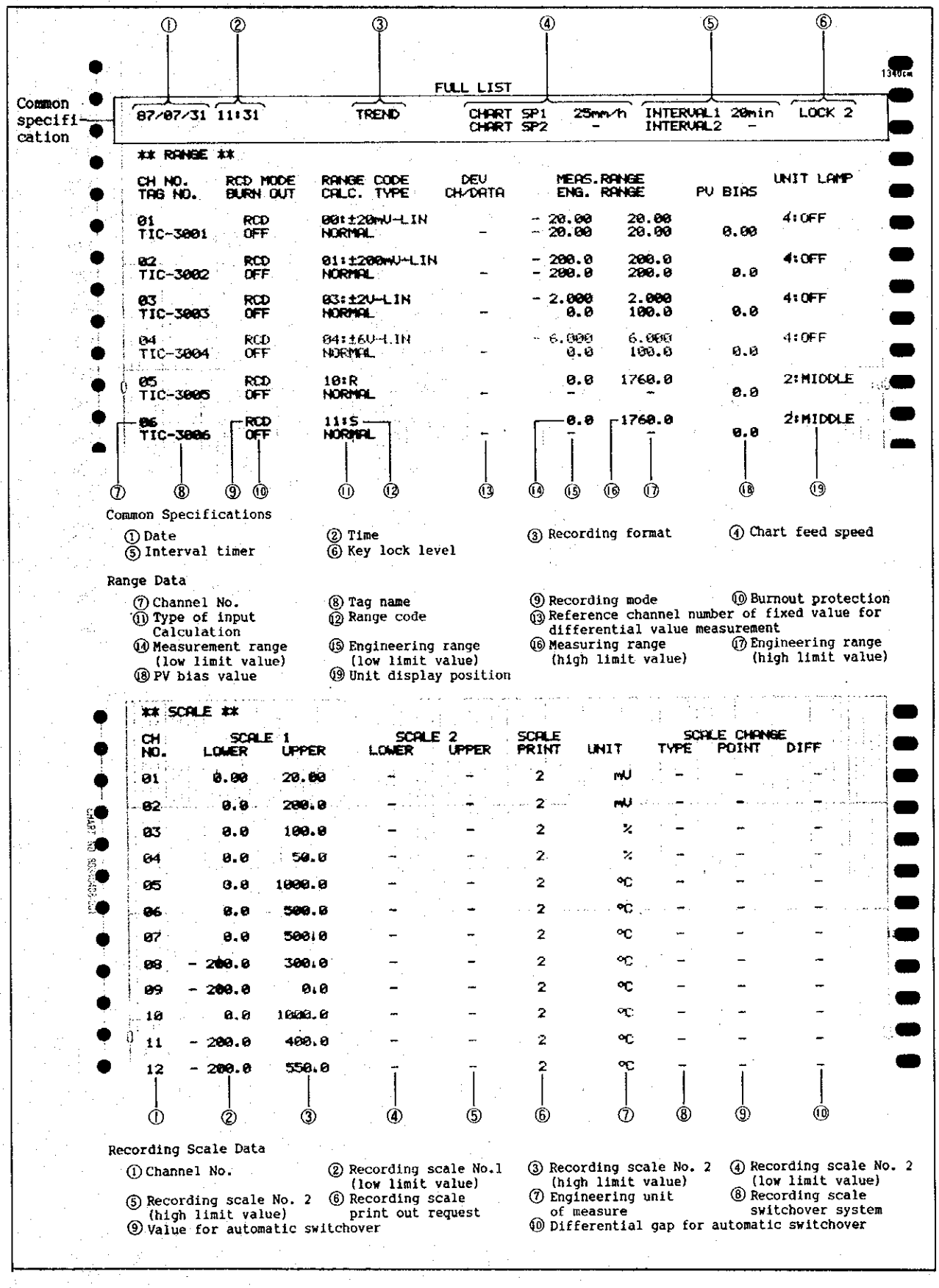
6) KEY LOCK KEY-LOCK key



To release the locked keys

The locked keys can be released by pressing the KEY LOCK key for approximately 3 seconds. The lamp goes off when the unlocked state.

9.2 Example of Total List Print Out



Common Specifications

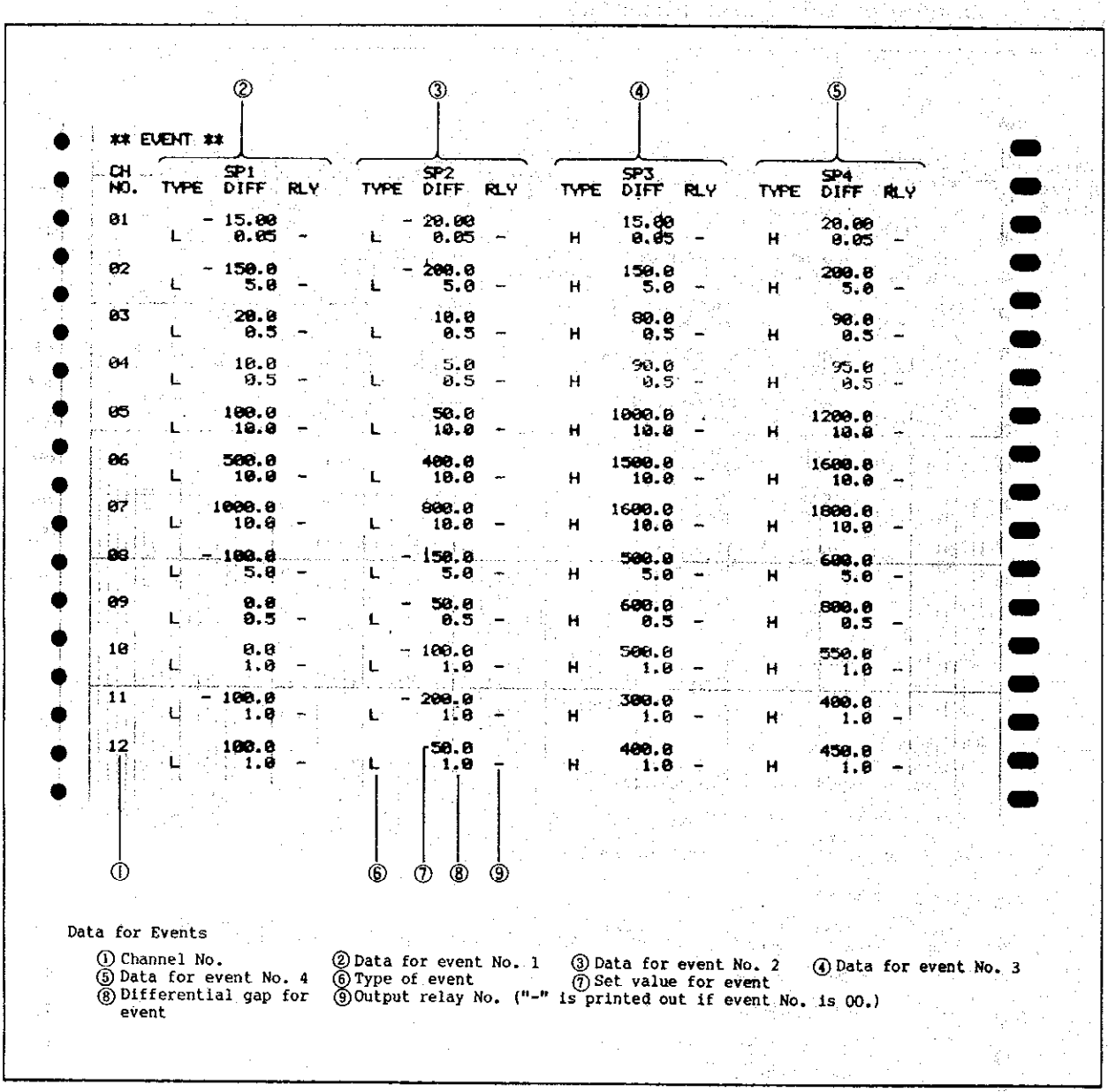
① Date
② Time
③ Recording format
④ Chart feed speed
⑤ Interval timer
⑥ Key lock level

Range Data

⑦ Channel No.
⑧ Tag name
⑨ Recording mode
⑩ Burnout protection
⑪ Type of input Calculation
⑫ Range code
⑬ Reference channel number of fixed value for differential value measurement
⑭ Measurement range (low limit value)
⑮ Engineering range (low limit value)
⑯ Measuring range (high limit value)
⑰ Engineering range (high limit value)
⑱ PV bias value
⑲ Unit display position

Recording Scale Data

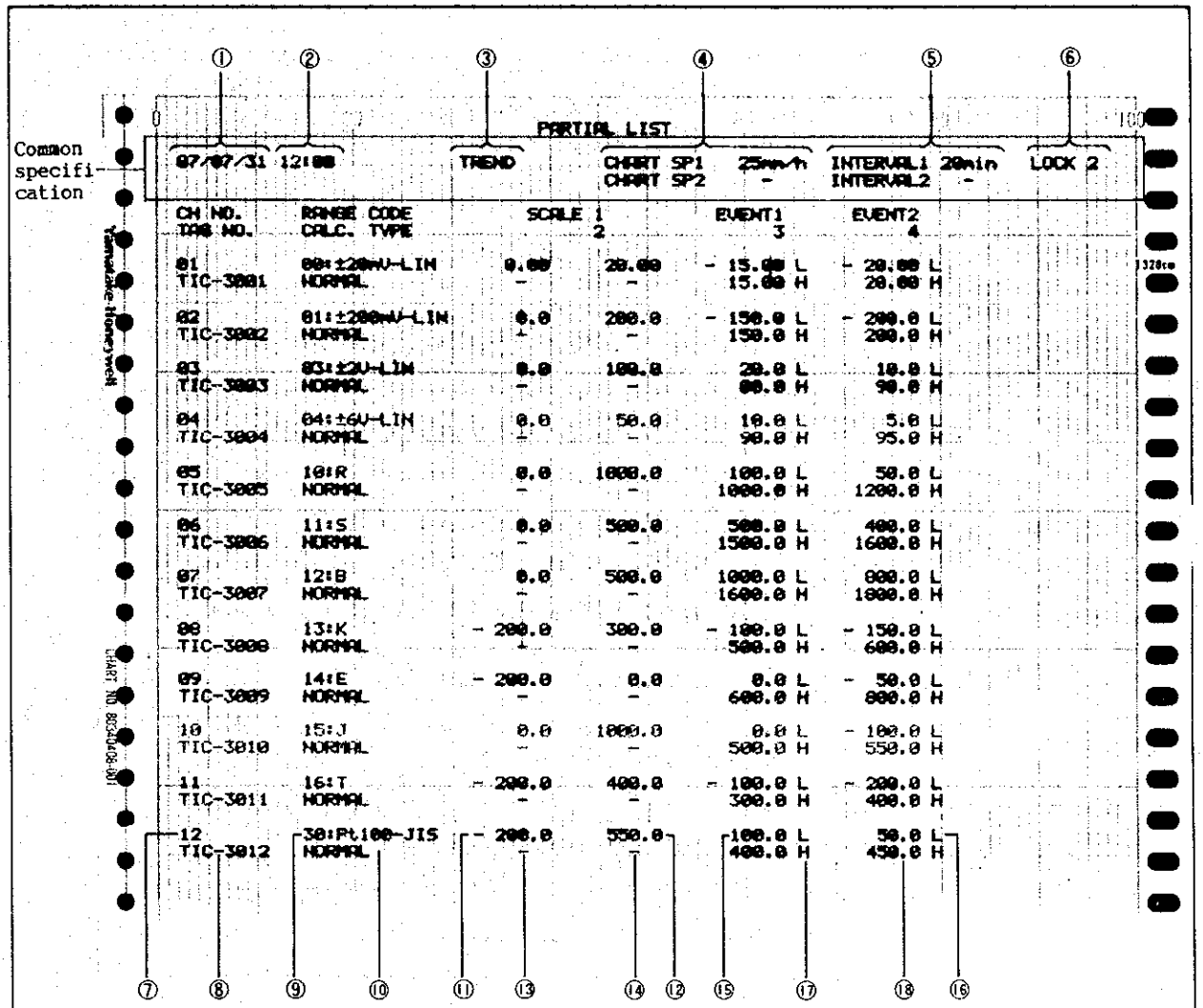
① Channel No.
② Recording scale No.1 (low limit value)
③ Recording scale No. 2 (high limit value)
④ Recording scale No. 2 (low limit value)
⑤ Recording scale No. 2 (high limit value)
⑥ Recording scale print out request
⑦ Engineering unit of measure
⑧ Recording scale switchover system
⑨ Value for automatic switchover
⑩ Differential gap for automatic switchover



Data for Events

① Channel No.
② Data for event No. 1
③ Data for event No. 2
④ Data for event No. 3
⑤ Data for event No. 4
⑥ Type of event
⑦ Set value for event
⑧ Differential gap for event
⑨ Output relay No. ("-" is printed out if event No. is 00.)

9.3 Example of Partial List Print Out



Common Specifications

① Date ② Time ③ Recording format ④ Chart feed speed
⑤ Interval timer ⑥ Key lock level

Set Data

⑦ Channel No. ⑧ Tag name

Range Setting

⑨ Range code ⑩ Type of input calculation

Recording Scale

⑪ Recording scale No. 1 (low limit value) ⑫ Recording scale No. 1 (high limit value)
⑬ Recording scale No. 2 (low limit value) ⑭ Recording scale No. 2 (high limit value)

Data for Event

⑮ Value for event No. 1, type of event (H/L) ⑯ Value for event No. 2, type of event (H/L)
⑰ Value for event No. 3, type of event (H/L) ⑱ Value for event No. 4, type of event (H/L)

10. DIAGNOSIS

The DPR500 is incorporated with diagnostic functions and its functions are automatically checked. The checked items are as shown in Table 10.2. When an abnormal state is detected, it is displayed with a code. This display has the highest priority and remains displayed until the state is remedied.

Table 10.1. Diagnosed Items

Diagnosed item	Content of diagnosis
1. ROM	Check-sum diagnosis for each 1K bytes
2. E²PROM	Verification when writing data
3. RAM	Read-after-write check (except the stack areas)
4. RTC	Busy flag check for clock LSI (check for abnormally long busy)
5. Selector	Check of zero reset position
6. Printer	Check of zero position detect
7. Calibration	Verification of calibration data (verification with three data values)
8. Auto zero input	Check of auto zero input range
9. Reference junction input	Check of reference junction input value
10. Configuration data	Verification of range code data
11. Communication diagnosis	When the communication function is included, communication protocols are checked.
12. RAM diagnosis (for semi-standard ranges)	Semi-standard range data is loaded from EEPROM onto RAM for check-sum diagnosis.

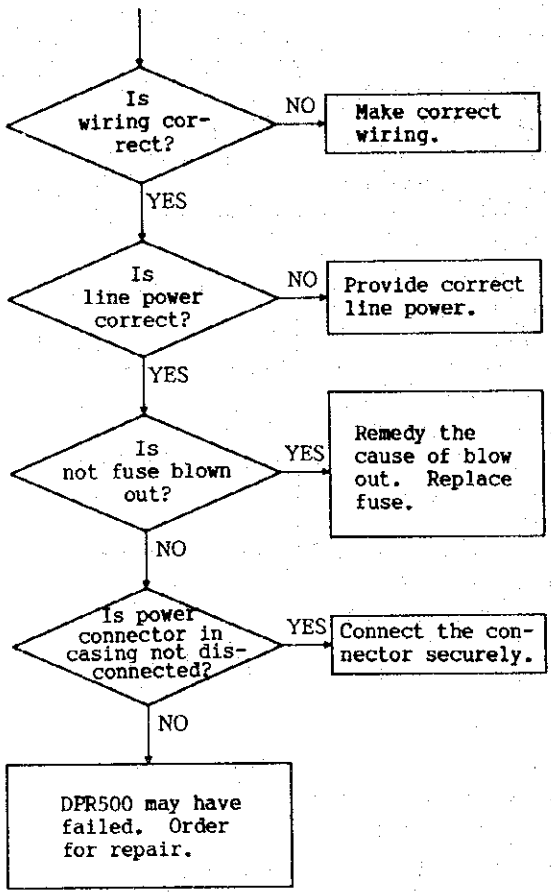
Table 10.2. Measure Taken When Abnormality Is Detected

Abnormal item	Measure taken	Error code
1. ROM	Error code is displayed. Operation is continued.	Err 01 (blinks)
2. E²PROM	Error code is displayed. Operation is continued.	Err 02 (blinks)
3. RAM	Error code is displayed. Operation is continued.	Err 03 (blinks)
4. RTC	Error code is displayed. Operation is continued.	Err 04 (blinks)
5. Selector	When abnormality is detected, the item is checked for 10 times. If still abnormal, error code is displayed and operation is halted.	Err 05 (illuminates)
6. Printer	Error code is displayed and recording is terminated. Input processing (including alarm processing) is continued.	Err 06 (blinks)
7. Calibration data	Data is judged to be abnormal if all of three data values stored on E²PROM do not conform. Error code is displayed. The 2nd value is used for the data item.	Err 07 (blinks)
8. Auto zero input	Input value is checked for each gain and judged to be error if it is not within the range. Error code is displayed. For the auto zero input value, the high or low limit value is used.	Err 8 (blinks)
9. Reference junction input	Input value is checked for a range of -30 to 80°C, and judged to be error if it is not within the range. Error code is displayed. For the input value, the high or low limit value is used.	Err 9 (blinks)
10. Configuration data	When an invalid range code data is detected, error code is detected, error code is displayed. For the range code, a default value (± 6 V range) is used.	Err 10 (blinks)
11. Communication abnormal	Error code is displayed. Operation is continued.	Err 11 (blinks)
12. RAM diagnosis (for semi-standard ranges)	Error code is displayed. Operation is continued.	Err 12 (blinks)

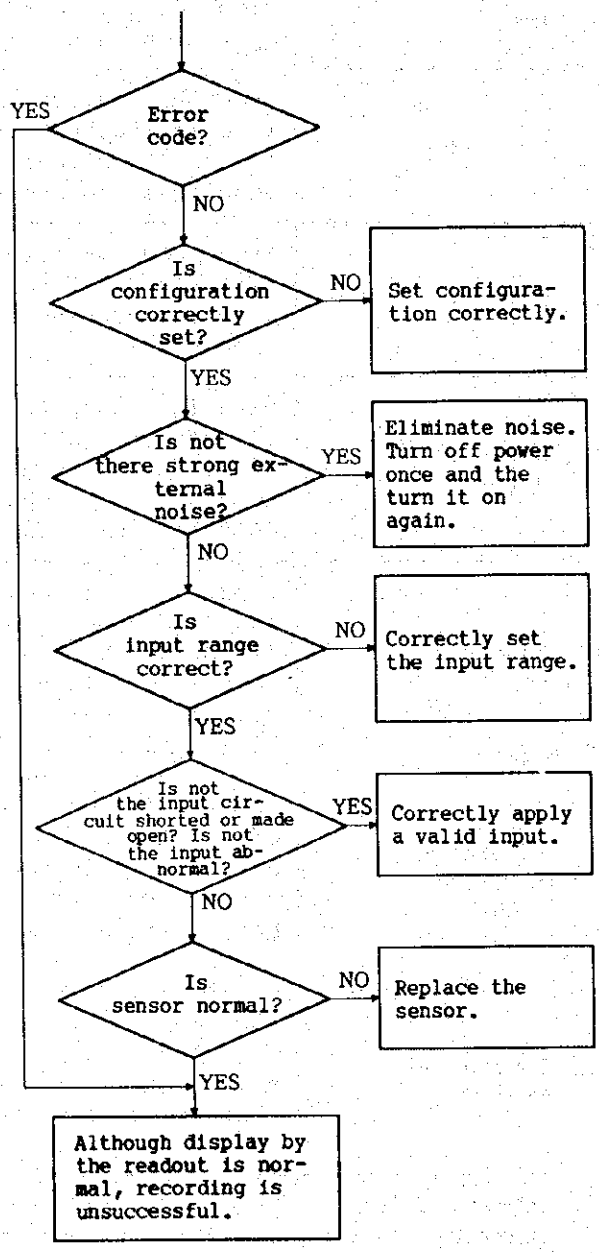
11. TROUBLESHOOTING

Simple troubleshooting procedures are given with a flowchart below. When the DPR500 has become seemingly in operative, check it referring to the chart. If the trouble is not remedied with these procedures, please order your Yamatake-Honeywell agent for repair.

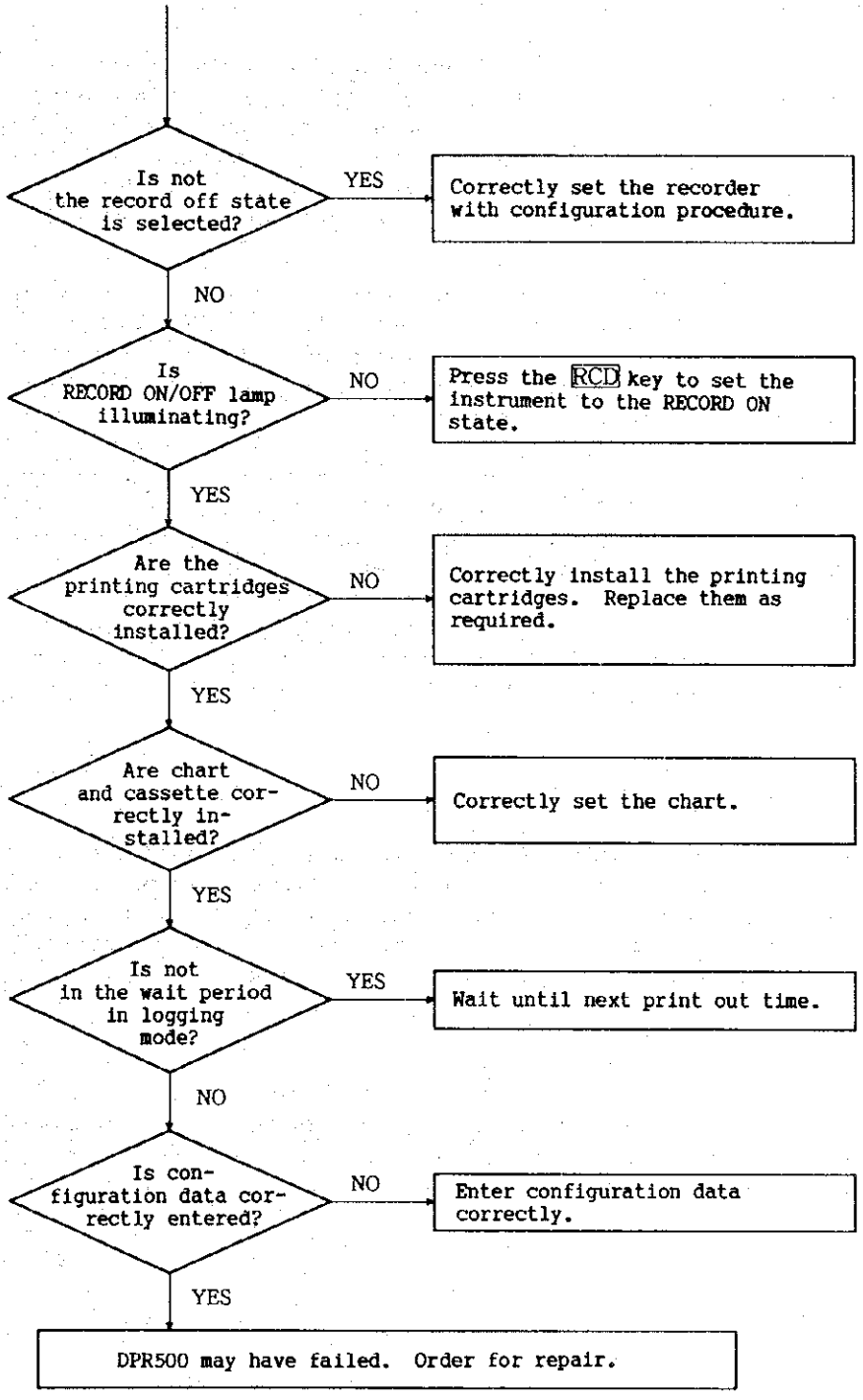
① Utterly inoperative (no display and no recording at all)



② Display is abnormal



③ Although display by the readout is normal, recording is unsuccessful.



12. MAINTENANCE

12.1 Replacement of Chart Paper

When the chart paper has run out and its remaining length has become 1.5 m, a red alarm mark appears at the right hand side on the chart. It is most recommendable to replace the chart soon after the red mark has appeared. Note that the printing tips and printing mechanism are adversely affected if recording is made with chart paper run out. for the chart paper loading procedure, refer to Section 6.2 "Loading the Recorder with Chart Paper."

Chart feed speed	Per book of paper	Per 1 m
12.5 mm/hr	Approx. 66.6 days	80 hr
25 mm/hr	Approx. 33.3 days	40 hr
50 mm/hr	Approx. 16.6 days	20 hr
75 mm/hr	Approx. 11.1 days	Approx. 13.3 hr
150 mm/hr	Approx. 5.5 days	Approx. 6.6 hr

Length of a book: Approx. 20 m

12.2 Replacement of Printing Cartridges

When recording has become unclear, replace the printing cartridges with fresh ones. For the printing cartridge replacement procedure, refer to section 6.3 "Preparation for Recording." The ink capacity of the printing cartridge is such that it last for about 2 months when the chart feed speed is 25 mm/hr, at normal ambient temperature and humidity.

12.3 Replacement of Clock Backup Battery

It is recommendable to replace the battery earlier, as recommended by the battery manufacturer. One year may be a most recommendable period. For the replacement procedure, refer to Section 6.4 "Clock Backup Battery."

13. REPLACEMENT OF WEARABLE COMPONENT (SELECTOR UNIT)

The selector unit selects the input signals to be measured. It is directly connected to the input terminal board connector.

The selector unit is a wearable component and it should be replaced at every 5 years or thereabout.

13.1 Removing the Selector Unit

To remove the selector unit, proceed as follows:

(1) If the instrument is in the RECORD ON state, turn it to OFF by pressing the RCD key. (The RECORD ON/OFF lamp will go off.)

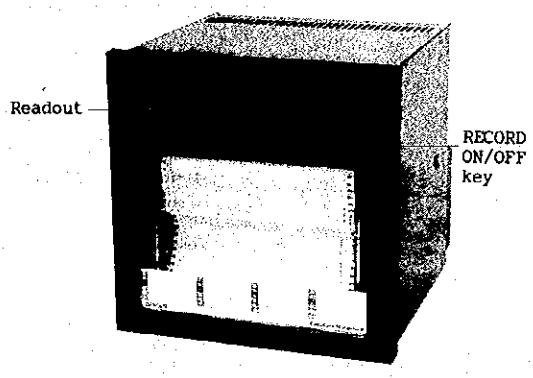


Fig. 12.1

(2) Keeping the chassis latch (1) pressed, pull out the chassis from the casing. Turn off the POWER switch.

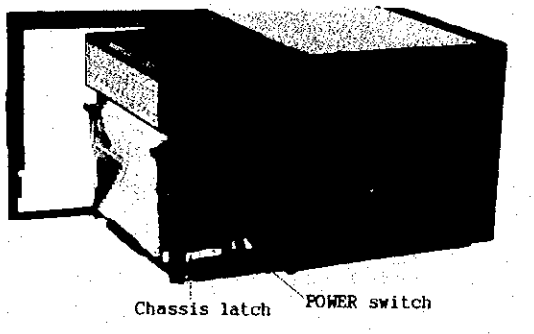


Fig. 12.2

(3) Keeping the chassis latch (2) pressed, remove the chassis from the casing.

Note: As the chassis is detached from the casing, be careful not to drop the chassis.

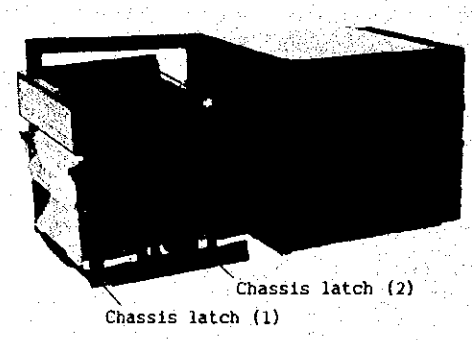
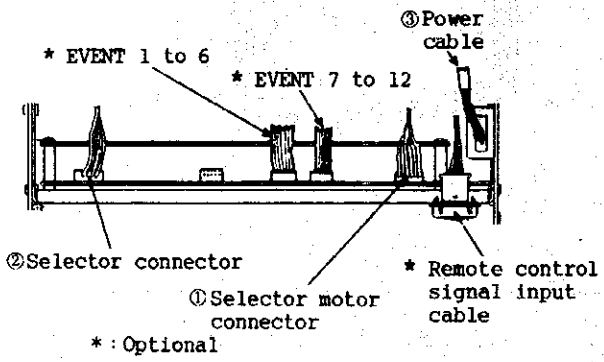


Fig. 12.3

(4) Disconnect ① selector motor connector, ② selector connector, and ③ power cable from the chassis. If the instrument is incorporated with the EVENT output circuit (optional), disconnect its connectors (*) also from the chassis.



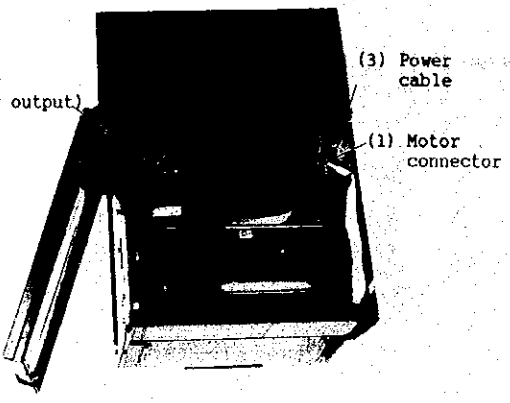


Fig. 12.4

(5) Remove the two screws of the selector cover.

(6) Pull out the cables by releasing it from indents ④ and ⑤ shown in Fig. 12.5.

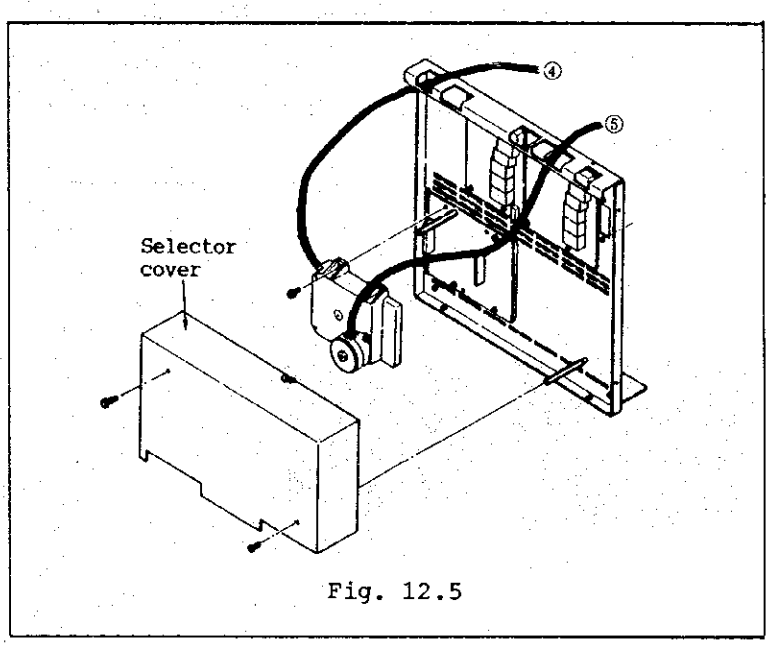


Fig. 12.5

(7) Remove the two mounting-screws of the selector unit. Detach the selector unit from the terminal board by pulling the selector unit in the direction shown with an arrowhead in Fig. 1.26.

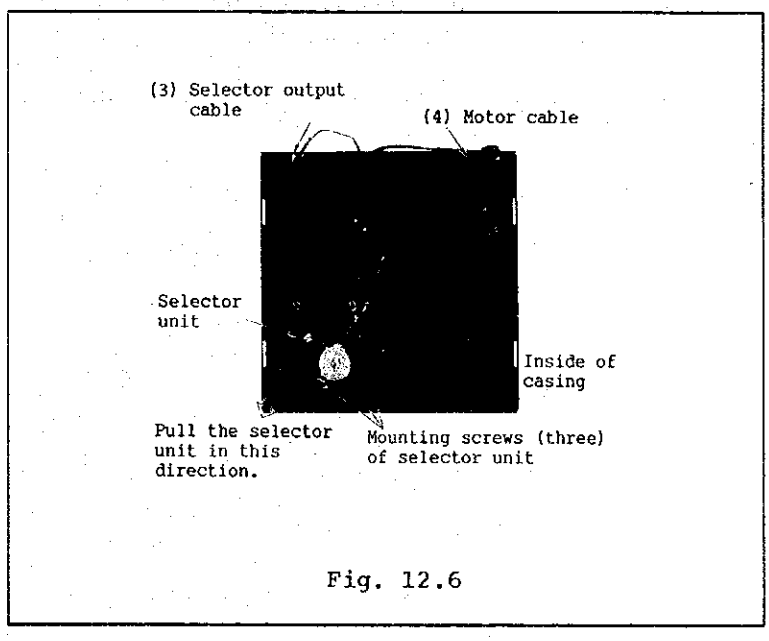


Fig. 12.6

13.2 Installing the Selector Unit

To install the selector unit, proceed as follows:

(1) Connect the two 14-pin connectors which connect the selector unit to the terminal board.

(2) Fix the selector unit to the terminal board with the three mounting screws. (See Fig. 12.6.)

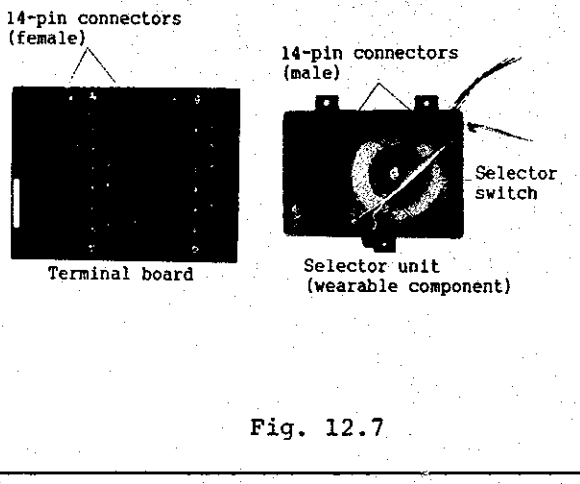


Fig. 12.7

(3) Pass the motor cables through the indent of the cover and fix the selector cover with the two screws.

(4) Pass the motor and selector output cables through indents ⑦ and ⑧ shown in Fig. 12.8.

(5) Connect the cable connectors to the chassis. (See Fig. 12.4.)

(6) Put back the chassis into the casing.

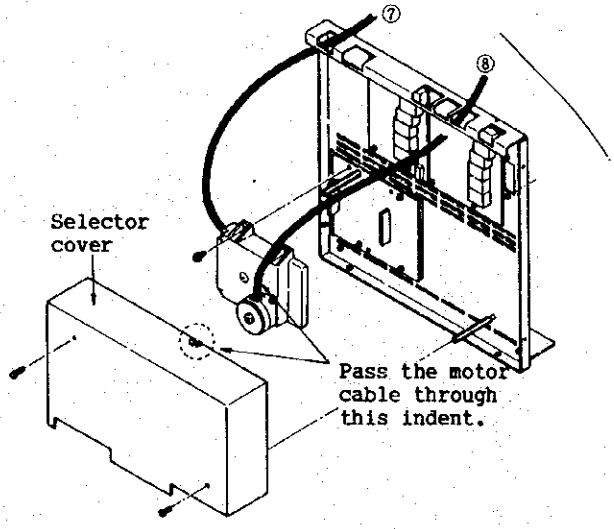


Fig. 12.8

14. DEFAULT VALUES FOR CONFIGURATION DATA

Default values as shown below have been entered for respective configuration items.

Digital Process Reporter (DPR500) Configuration Sheet

Entry item			Channel No. 8	8	8	8	8	8	8	8
RANGE	①Record mode ②Range code ③Unit of measure					① 3		② 00		③ 1
	①Input calculation type ②Reference channel ③Burn-out p.					① 1	② 01			④ 1
	Measuring range	Lower limit value			Entry procedure	-20.00	Default value differs depending on range code. (See Note 1.)			
		Upper limit value				20.00				
	Engineering range	Lower limit value				-20.00				
		Upper limit value				20.00				
	Fixed value for difference calculation					00.00	Place of decimal point and the number of digits differ depending on range code and engineering range.			
	PV bias value					00.00				
SCALE	Scale #1	Lower limit value				-20.000				
		Upper limit value				20.00				
	Scale #2	Lower limit value				*1 -20.00				
		Upper limit value			Entry procedure	*1 20.00				
	①Scale print out requirement ②Switching system					① 1		② *1		
	Value for automatic switchover					*1 00.00				
	Differential value for automatic switchover					*1 00.00				
EVENT	① Type of event ② Relay No.					① OFF		② *1 01		
						① OFF		② *1 01		
						① OFF		② *1 01		
						① OFF		② *1 01		
	Value for event					00.00				
						00.00				
					Entry procedure	00.00				
						00.00	Place of decimal point and the number of digits differ depending on range code and engineering range.			
	Differential value for event					00.00				
						00.00				
						00.00				
TAG	Character code (8-character: hexadecimal)(*2)				Entry procedure = Character No.	(01 □□□□□□□□) 1. 30 2. 20 3. 20 4. 20 5. 20 6. 20 7. 20 8. 20				
UNIT	Character code (6-character: hexadecimal)					(□□□□□ mV) 1. 20 2. 20 3. 20 4. 20 5. 60 6. 56				
FORMAT	Recording format					1	—			
SPEED/ INTVL	Chart feed speed interval timer				Entry procedure	2	Chart speed (typical)			
						*2	Chart speed (typical)			
						3	Interval timer (typical)			
						*3	Interval timer (typical)			
SYSTEM	Key-lock level					1				
DATE	①Year ②Month ③Day		①JUST for fill			② JUST for fill			③ JUST for fill	
CLOCK	①Hour ②Minute					① JUST for fill			② JUST for fill	

Note 1) Measuring Range Upper/Lower Default Value

Range \ Code No.	00	01	03	04
Lower limit value	-20.00	-2.000	-2.000	-6.000
Upper limit value	20.00	2.000	2.000	6.000

(*1): Effective only when the optional provision is incorporated.
(*2): A channel number is entered for each of the channels.

Record mode	Range								Input calculation type	Scale print out requirement
1: OFF (OFF mode) 2: DISP (Display mode) 3: RCD (Display and record mode)	Range code	Type of input	Range	Remark	Range code	Type of input	Range	Remark	1: PV (direct) 2: Difference between channels (Reference - own) 3: Difference between channels (Own - reference) 4: Difference from fixed value (Fixed - own) 5: Difference from fixed value (Own - fixed)	1: #1 - OFF, #2 - OFF 2: #1 - ON, #2 - OFF 3: #1 - OFF, #2 - ON 4: #1 - ON, #2 - ON
	00	mV	±20	DC voltage (Linear scaling)	16	T	-200~400	Thermocouple °C		Switching system
	01		±200		17	W5Re26	0~2315			1: No switchover 2: Auto 3: Remote
	03	V	±2		18	NiNiMo*	0~1200*			
	04		±6		30	JPt100	-200~550	Reference temperature sensor °C		
Unit of measure	10	R	0~1780	Thermocouple °C	31	JPt50	-200~550		Burnout protection	Type of event
1: Top 2: Center (°C) 3: Bottom 4: No indication	11	S	0~1780		32	Ni508	-50~150		1: Off 2: Upscale 3: Downscale	HI (H): HIGH LO (L): LOW OFF (-): OFF
	12	B	400~1820		* When a semi-standard input is involved, the tye of input specified with a code number replaces the Ni-NiMo type (Range Code 18). That is, for a semi-standard type of input, configuration should be made by means of Range code = 18.					
	13	K	-200~1370							
	14	E	-200~800							
	15	J	-200~1100							

Recording format	Chart speed	Interval timer	Key-lock level
1: Trend 2: Trend + Log 3: Log	1 : 12.5mm/h 2 : 25mm/h 3 : 50mm/h 4 : 75mm/h 5 : 150mm/h	1 : 10min 2 : 20min 3 : 30min 4 : 1h 5 : 2h 6 : 3h 7 : 6h 8 : 12h 9 : 24h	To be operated 1 : DISPLAY ◀ ▶ 2 : Furthermore + SHIFT DMD PART LIST BACK FEED RCD 3 : Furthermore + Tenkeys DATA SET

Table of Characters

Bottom / Top	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
2		!	"	#	$	%	&	'	(	)	*	+	,	−	.	/
3	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4	ⓐ	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5	P	Q	R	S	T	U	V	W	X	Y	Z	[	¥	]	^	—
6	`	a	b	c	d	e	i	g	h	i	j	k	l	m	n	o
7	p	q	r	s	t	u	v	w	x	y	z	Ω	Ω	μ	^{2}	$_2$
8	^{3}	°	$_\circ$	•												

Note: The character codes are for entry of tag name and engineering units of measure with 2-digit codes.

Specifications are subject to change without notice.

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Saveration
Helping You Control Your World

Printed in Japan. (H)

5.2 Datalogger

LANDSCALE

MDL-1000

Ver.1.8

MANUAL

KARTER ART LANDSCAPE Inc.

TABLE OF CONTENTS

Introduction

Research of natural sciences requires a lot of data. However, collecting environment data is expensive and labor intensive. For example, an observation and recording device is necessary to collect data over a long period of time. It is also necessary to find space for the instruments and to change the recording paper once a month. Even if data collection is successful, more months of manpower are necessary to analyze the data. To analyze data, the researcher needs to be able to visualize and experience natural climatic conditions while relaxing over a cup of coffee.

LANDSCALE MDL-1000 II was designed to collect and analyze environmental data and assist in the development of environmental sciences.

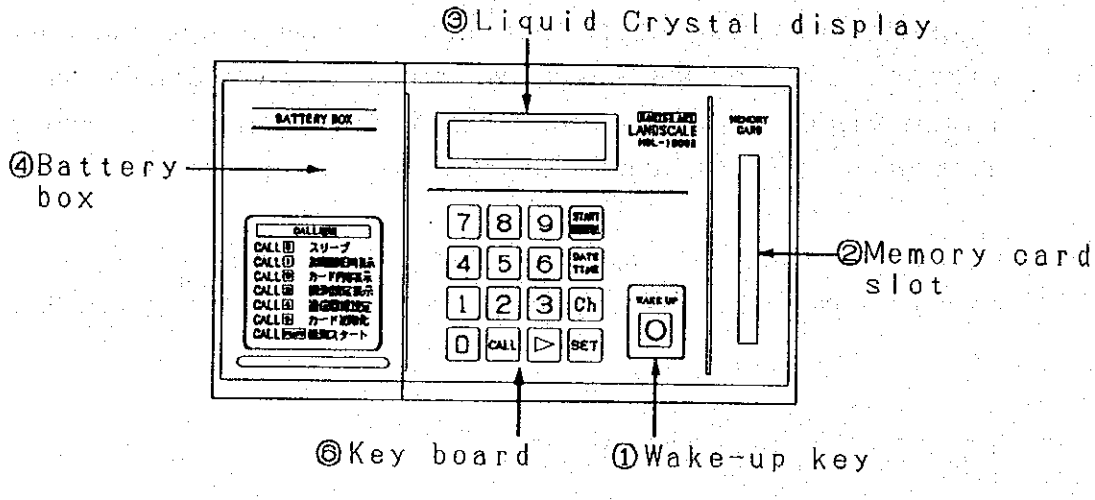
This manual is divided into two sections:

I Overview
The functions of each part of the LANDSCALE are explained.

II Operation
Programming of the LANDSCALE is explained.

I Overview

1. Identifying parts I (the panel)



(1) Wake-up key 

This key turns on the main battery of the LANDSCALE. When pressed, the liquid crystal display should read LANDSCALE MDL-1000 II V1.8, indicating that the LANDSCALE is operating.

(2) Memory card slot

This is where memory card records information. Additionally, when the memory card is inserted, information can be retrieved using the keyboard.

(3) Liquid crystal display

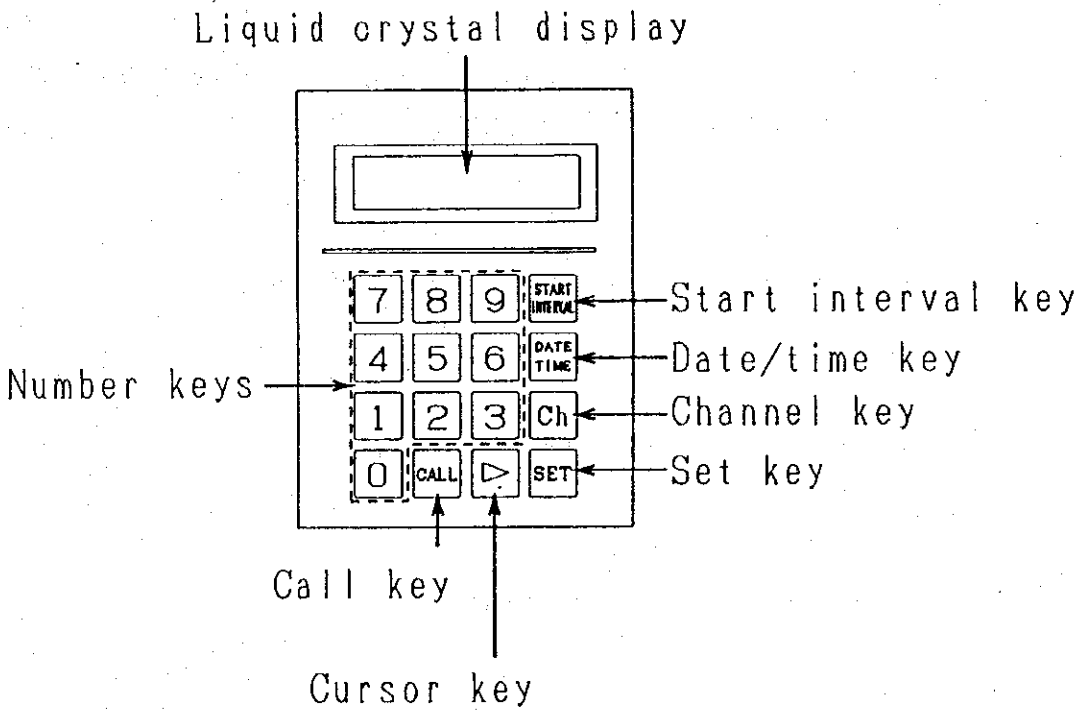
The 16-character/2-line liquid crystal display enables the user to confirm commands and settings. When the display is functioning, the machine is operational and consuming electricity. In low temperatures, the function is slow to display information. In temperatures near 0℃, the display may shut off but there will be no damage to the machine.

(4) Battery box

A lithium battery (sold separately) is placed in the battery box. Do not crush or tamper with the battery.

(5) Keyboard

The keyboard contains 16 keys which can be used to display each function. The date time key, channel key and call key are the "hot keys" and are used for most functions.



START INTERVAL Start interval key

When operation begins, this key can be used to set or adjust the starting time or the observation interval.

DATE TIME Date/time key (hot key)

Within the body of the instrument is a real-time clock that displays the time.

Ch Channel key (hot key)

To see the current observation value, push the channel key followed by the channel number. Alternatively, push the channel key continuously and the channel number will appear beginning with 0 and ending with 9.

SET Set key

The set key is used to operate all of the settings of the LANDSCALE.
This key is also used to switch to the sensor setting mode.

CALL Call key (hot key)

This key is used to call the function of the LANDSCALE.

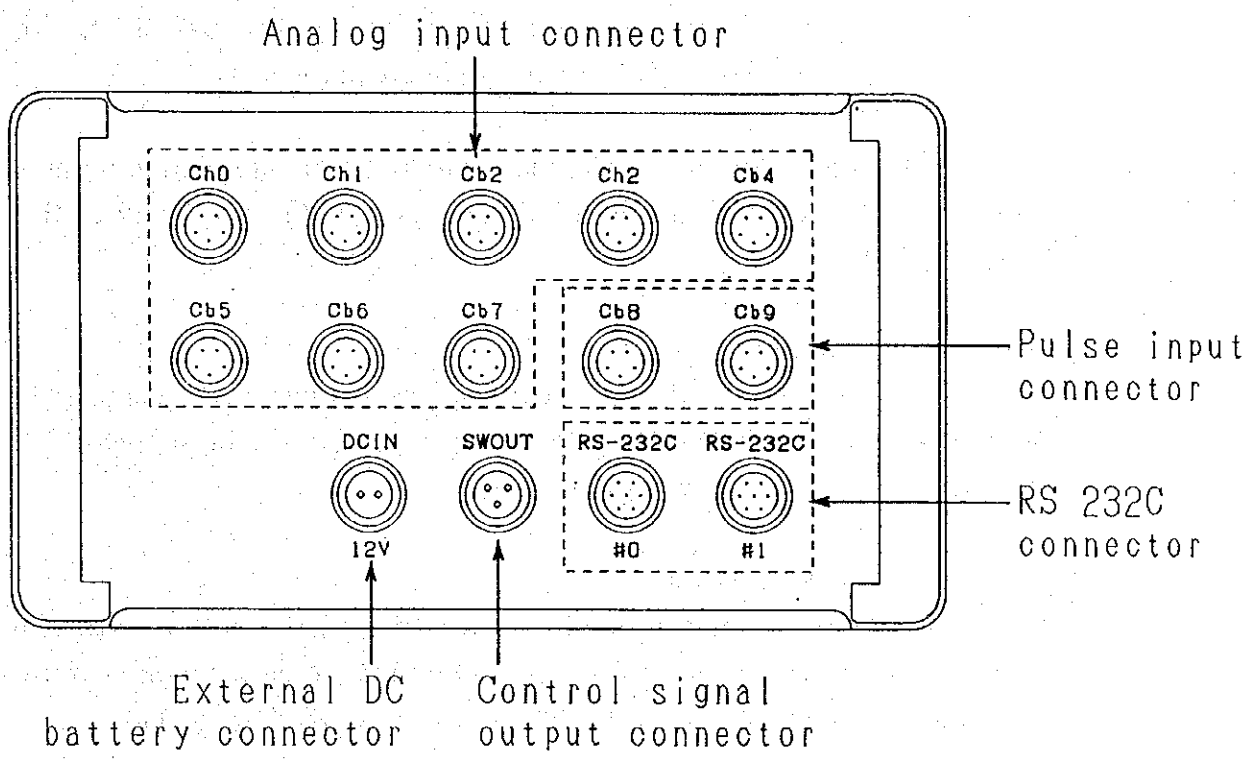
▶ Cursor key

This key is used to move the cursor.

0 ~ 9 Number keys

These keys are used to input numbers.

2. Identifying parts Ⅱ (the backside)



(1) Channel connector

This is the connector used for connecting the sensor. There are 10 connectors, of which 8 are analog input connectors and 2 are pulse input connectors.

Channels 0 through 7 – Analog input connectors (5 pin)

Analog input refers to the direct current sent from the sensor signal. The input range is direct current from 0–+/–5 V.

Channel 8 and 9 - Pulse input connectors (5 pin)

Channel 8 and 9 are the pulse input channels. Pulse input is possible by using the point of contact method or the pulse method.

The point of contact method counts the number of times the LANDSCALE's power has been directly accessed. The pulse method uses the LANDSCALE's sensor to determine the number of pulses. The pulse voltage swing is +5V. The signal's maximum frequency is 50 Hz.

The maximum number that can be input within the observation interval is 65536 (this is determined by the 16-bit counter in the body of the LANDSCALE).

(2) External DC connector (2 pin)

This is the connector used to access external power sources. Please use the DC power source as indicated by Karter Art. To output stable regulated DC 12 V, use a power source with 1A or above.

(3) RS-232C connector (7 pin)

This is a connector used to hook up the LANDSCALE with a personal computer or other devices. To transfer the information on the memory card to a personal computer, use this connector and a RS-232C connector.

(4) Control signal output connector (3 pin)

This connector is used to externally operate the on/off switch. This is used to attach other external controls such as amps and integrating meters.

3 . Power sources for the LANDSCALE

Depending on the conditions of use, there are three possible power sources for the LANDSCALE. Decide on a power source based on the conditions in which the LANDSCALE will be operating.

(1) Lithium battery

Sold separately, the lithium battery is placed in body of the LANDSCALE and provides a power source for the machine. This lithium battery has a maximum capacity of 7 Ah.

Do not use the lithium battery as backup power source, when you use the external power supply or DC power.

(2) External power source

Standard 12V batteries may also be used. If this method is used, we suggest a inner battery(dry batteries) be installed as backup power source. Do not use a lithium battery as backup.

(3) DC power

Regulated DC power supply may also be used. If DC power is used, please use the recommended device (for an output of DC 12V , use a source of 1Ah or above). If this method is used, we recommend a inner battery(dry batteries) be used as a backup power source.Do not use a lithium battery as backup.

4. Memory card

The output signal of the sensor is stored on the memory card. There are four ways to store information on the memory card.

	Memory Capacity	Data Quantity
1.	128KB	25,000
2.	256KB	50,000
3.	512KB	100,000
4.	1024KB	200,000

A lithium battery is included in the memory card. The duration of the backup provided by this battery varies with the make of the battery. Check the maker's catalog for more information.

Caution:
Only eject the memory card when the LANDSCALE has been turned off.
Push the memory card completely into the slot.
Avoid getting water, sand or dust on the memory card.

Ⅱ OPERATION

1. Starting the LANDSCALE

To minimize electrical costs, turn the LANDSCALE off when not in use.
To turn off it on,

① Push the wake-up key [WAKEUP O]

The display should read as follows:

LANDSCALE
MDL−1000Ⅱ V1.8

If the machine is currently operating, an asterisk(*) will appear before the line that reads MDL-1000 Ⅱ V1.8

LANDSCALE
*MDL−1000Ⅱ V1.8

2. Turning off the LANDSCALE (power off)

When use of the keyboard has been completed and the LANDSCALE is to be turned off,

① First push the call key [CALL] followed by the 0 key [0]

When the display turns off, the power is off.

3. Displaying the current time and making adjustments

A quartz clock is included in the LANDSCALE. This is the clock used for observation. Before setting the observation time, always check the current time with the clock.

① Push the date/time key [DATE TIME]

The first line of the display should show the date. The second line should show the time in hours, minutes and seconds.

```
DATETIME  93-03-01
          08:45:30
```

② To adjust the current time, push the cursor key [▶]

The setting message will appear and the cursor will appear under the first character on the display.

```
          93-03-01
SETTING   08:45:30
```

③ Use the number key to change the date or time.

④ Finally, push the set key [SET] to lock in the new time.

The display will now read the current time.

4. Changing the settings of sensor

Necessary settings are already set up at the shipping.
Set the sensors for each channel.
Every time you change the settings of sensor, to exchange the card are required. After exchanging the card, do as follows.

① Push the channel key [Ch]

Ch0 will appear on the display.

② Next push either the channel key [Ch] or the number keys 0–9 to the desired channel. This is now the channel to be used for observation.

```
Ch3 WATER LEVEL
          10.0m
```

[Ch3 has been set to the WATER LEVEL.]

③ Next, push the set button [SET]

The display will indicate the types of sensors that can be used for the given channel.

```
Ch3 WATER LEVEL
SENSOR    10.0m
```

④ Next, push the cursor key [▶] to show the possible settings.

⑤ Once again push the cursor key [▶] to the desired setting.

The settings are as follows:

Ch0 – Ch7

SUBSIDENCE	mm
WATER LEVEL	m
NO SETTINGS SET	

Ch8, Ch9

WIND SPEED (using the pulse calculation)	m／s
RAINFALL	mm
COUNTER	
NO SETTINGS SET	

⑥ Select the sensor, then push the set key [SET]

⑦ After seting the all channel, push the call key [CALL], then the 5 key [5] to inisialize the card.

(See P.13)

⑧ Push the call key [CALL], then the start interval key [START INTERVAL] to start observation.(See P.14)

5. Setting the operation time

The operation time is set the same way the sensors are set, each channel has its own operation time setting.

① Push the channel key [Ch]

Ch0 will be displayed.

② Push the start interval key [START INTERVAL]

The display should show the start date and time.

```
Ch0      93-03-03
START    10:00:00
```

[Ch0 has been set for an observation time of March 3, 1993 at 10:00 am.]

③ Push the cursor key [▶]

The cursor will appear under the first character on the display.

```
 Ch0      93-03-03
SETTING   10:00:00
```

④ Use the number key to change the date or time.

⑤ Push the set key [SET]

⑥ Push the channel key [Ch]

⑦ Push the call key [CALL], then the start interval key [START INTERVAL] to start observation.(See P.14)

6. Setting the observation interval

Set the operation interval in the same way as the sensor, with one setting for each channel.
Every time you change the settings of observation interval, to exchange the card is required. After exchanging the card, do as follows.

① Push the channel key [Ch]

The setting for Ch0 will appear on the display.

② Push the start interval key twice [START INTERVAL] [START INTERVAL]

The display should show the observation interval in hours, minutes and seconds.

```
Ch 0
INTERV  12:00:00
```

③ Push the cursor key [▶]

```
 Ch 0
SETTING  12:00:00
```

The observation interval can be adjusted 1,2,3,4,6,12 and 24 hours.

④ Using the cursor key [▶], sellect the interval time, and push the set button [SET]

⑤ Push the channel key [Ch]

⑥ Push the call key [CALL], then the 5 key [5] to inisialize the card.
(See P.13)

⑦ Push the call key [CALL], then the start interval key [START INTERVAL] to start observation.(See P.14)

7. Initializing the memory card

Initializing the memory card is always required,when changing the observation conditions and exchanging the memory card. Initializing the memory card erases existing data on the card and enables the LANDSCALE to operate under new settings.

① Push the call key [CALL], then the 5 key [5]

The display will ask if initializing is to begin. If the answer is yes,

② push the set key [SET]

When the initializing is complete, the display will read "END".

When the interval of observation or the conditions of observation have been changed, the memory card must be initialized. When the card is initialized, it will erase all existing data. If this data is necessary, store it on a personal computer before beginning the initialization process.

Caution:
Do not fail to initialize the memory card, just before starting the operation or after exchanging the memory card.

8. Copying the settings of the memory card to LANDSCALE

This operation is to copy the settings of memory card to LANDSCALE.

① Push the call key [CALL], the 1 key [1], then the cursor key [▶]

The display will ask if copying is to begin. If the answer is yes,

② Push the set key [SET]

③ Verify the operation time of each channel.

9. Starting observation

When the sensor, observation starting time and the observation interval have been set for each channel and the card has been initialized.

① Push the call key [CALL], then the start interval key [START INTERVAL]

The display will read "START OPERATION?"

② Push the set key [SET]

The liquid crystal display will automatically shut off and observation will begin.

③ To confirm the settings, once more push the wake-up key [WAKEUP ○]

LANDSCALE
*MDL−1000Ⅱ V1.8

If the asterisk appears before the MDL-1000Ⅱ line on the display, the settings are complete.

④ Push the call key [CALL], then 0 key [0] to turn off the machine.

10. Displaying the next period of observation

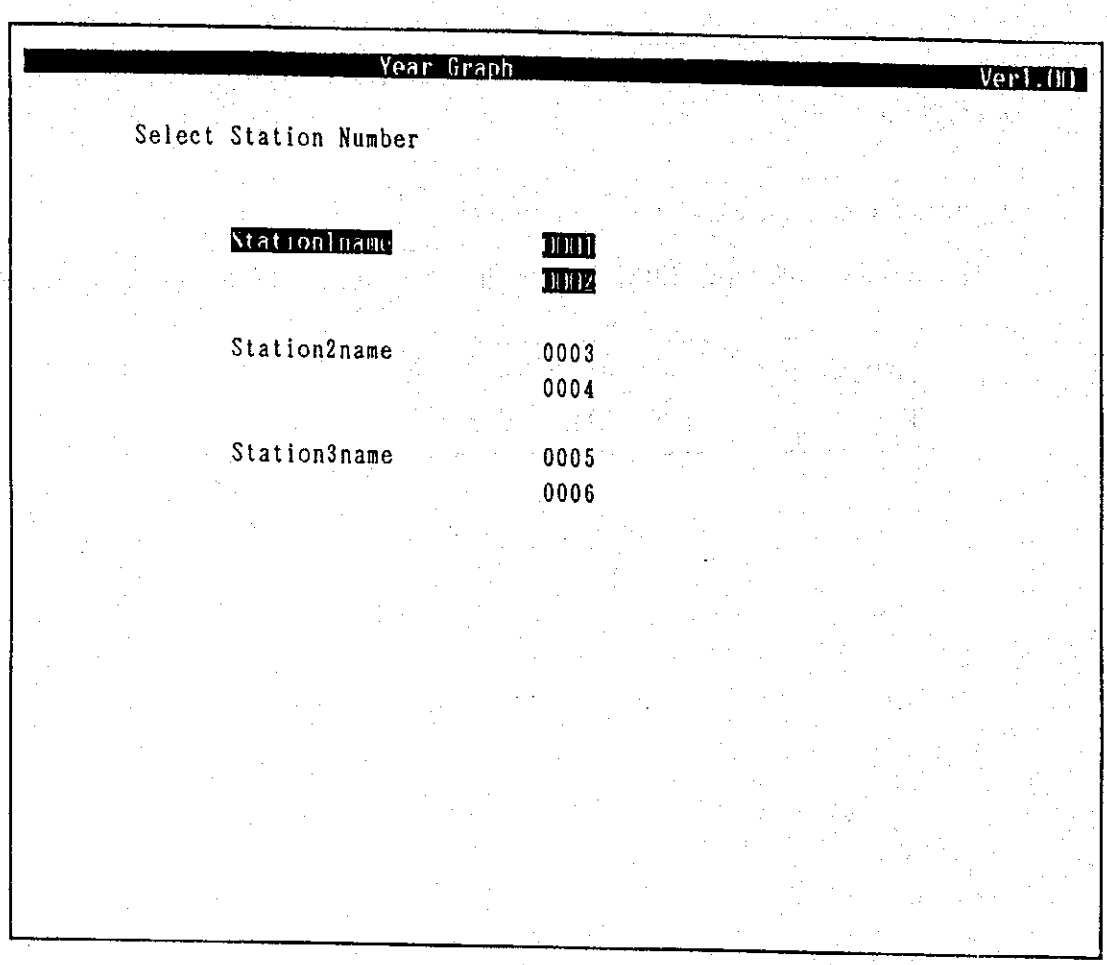
When the LANDSCALE is operating, it can display the next period of observation.

① Push the call key [CALL], then the 1 key [1]

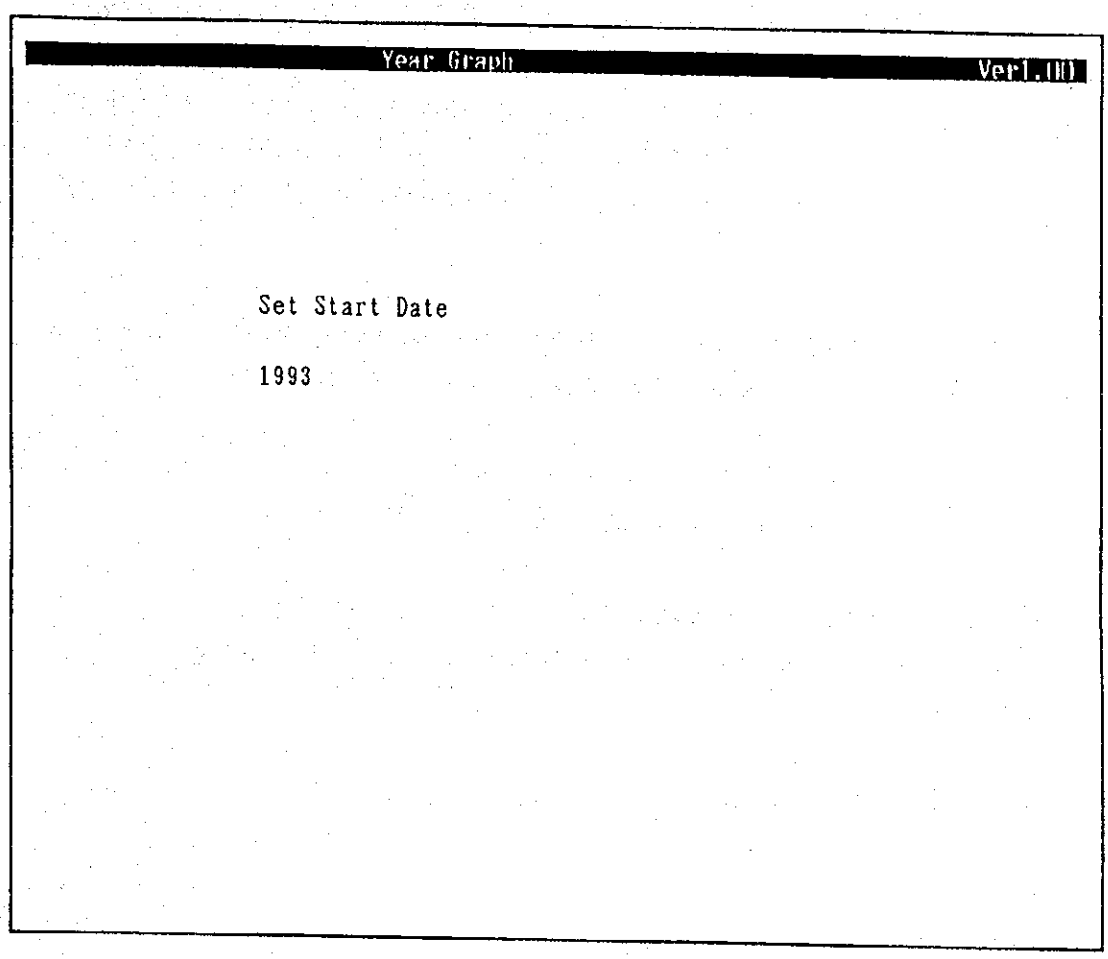
The display will show the data and rime of the next period of observation.

NEXT OP.	93−03−03
	12:00:00

• Year Graph



When selecting Year Graph, the Station Selection screen will be displayed.
Move to the station which you wish to print by pressing the "arrow keys", and press the RETURN key.
The screen will return to the Main Menu by pressing the ESC key or the EXEC key.



Enter the year next. Create a graph of the assigned year's data. Enter the year in numbers, and press the RETURN key.

Moving is possible by pressing the "arrow keys".

The screen will return to the Station Selection by pressing the ESC key.

The screen will return to the Main Menu by pressing the EXEC key.

13. Capacity of the memory card and its observation intervals

To reduce the memory needed for programming the memory card, the number of days available for observation has been limited when the observation interval is short. To choose the day of observation, follow the proceeding steps.

When using the 128 KB memory card (with a recording capacity of 25,000 pieces of data), each channel can record one hour of observation.

One day of observations consists of
10 pieces of data × 24 hours = 240 pieces of data/day

The number of days available equals
the data capacity of the memory card/desired pieces of data a day
25,000/24 = 104 days

The length of observation equals 104 days.

14. Reading the data

Procedure

At the site:

1. Remove the card and replace it (if observation is underway, do not try to remove the card.)
2. Transport the card

Once inside:

3. Turn on the PC
4. Insert the memory card
   Insert the memory card brought from the site
5. Set to MS-DOS A
6. Insert a floppy disk for transfer of the information into the B drive.
7. After A, press CR1 and return.
8. Use information on the screen.

5.3 Data Analysis Program

5.3 Data Analysis Program

Ver. 1.0

Operation Manual

[Program Installation]

Install program on hard disk

An example of a drive configurations is as follows. Begin installation after turning the power ON power or after resetting.

A drive: floppy part 1
B drive: floppy part 2
C drive: hard disk
D drive: JEIDA card drive

Place the original disk in A drive.

A: RETURN

The original disk is the current drive.

INSTALL RETURN

Install Logger Data Program. Are You Ready? (Y or N)
is displayed on the screen.

Enter Y

No need to enter RETURN. If you enter N, the program will be terminated.

Install Directory (ex. C: \LOGGER)
is displayed and enter the directory to be installed.

Do not enter \ afterwards. Do not assign the original disk drive.

C: \LOGGER Return

Next

C: \LOGGER Make OK? (Y or N)

is displayed next.

Enter Y

No need to enter RETURN. If N is entered the program will be terminated. The screen will return to directory entry by pressing the ESC key.

The key operations after this are as follows:

ESC Return to previous

END Suspend program

Enter 1 letter only for 1 letter entry. For a character string entry, press Return after entering. One letter before the cursor will be deleted by press the BS key or the DEL key.

Enter Card Drive? (ex. D)

is displayed and enter 1 letter of the JEIDA card drive.

Enter D

No need to enter Return.

Floppy Drive? (ex. A)

is displayed and enter 1 letter of the card data copy destination floppy.

Enter A

No need to enter Return.
After this, the drive will work briefly. After copying part of the data

Wake Up Drive? (ex. C)

is displayed. Assign the power ON time and drive to start up when resetting.
This is for change of CONFIG.SYS and batch file creation.

Enter C

No need to enter Return.

What Drive FORMAT.COM? (ex. C: \MSDOS)

is displayed. Assign the directory with FORMAT.COM.

C: \MSDOS Return

If FORMAT.COM is not installed on the hard disk, place the disk with FORMAT.COM in drive B and enter B: Return. Do not enter \ afterwards.

After this, the disk operates briefly,

Station 1 Name

is displayed and enter the name Station 1.
Refer to the following explanation for the configuration of the name.

Station 1 Return

This name is used for selection when creating charts, graphs, and titles. In the same way, enter the name Station 2 and 3.
The following is displayed after entering the station name.

Station 1 Logger 1 Number

Enter the 4 digit number of each logger which corresponds to the station.
Correctly enter the station for each Logger.

0001 Return

In the same way, set 6 Loggers, 2 Loggers for 3 stations.
The following is displayed after the Logger number.

Station 1 Logger 1 Ch 0 Name

Enter the name of each Logger based on the channel.
This will be the channel name on charts and graphs.
Up to 5 letters can be entered.

SB50 Return

In the same way, enter the names of 8 channels of 6 loggers. After operating the disk briefly, move to the execution file copy. If during this time a message such as "Disk is Full" or "Directory Assignment is Wrong" is displayed, this indicates an error therefore install again.

Installation is complete.
After resetting, the computer starts up by entering TCARD Return.

[Manual Installation]

The drive names assigned during installation are installed on the file. In the case of manual installation edit part of the file. Ordinary text editor is OK for editing. After installation, confirm what is shown is as follows.

• Directory configuration

Shows installation to C: \LOGGER.
Copy file as follows.

```
C: \
 └── LOGGER\
       ├── EXE (copy all EXE of the original disk)
       ├── ATT.BGI
       ├── UTY.TXT
       ├── FORMAT.COM (copy which attaches to DOS)
       ├── SYSTEM.TXT (content edit is necessary)
       └── STATION.TXT (content edit is necessary)
```

```
C: \(start up drive)
 ├── TCARD.BAT (batch file for start up  new creation)
 ├── NECPRT1.SYS (PCPR201 driver)
 └── CONFIG.SYS  (add DEVICE = NECPTR1.SYS)
```

• SYSTEM.TXT edit

SYSTEM.TXT includes display messages for each program.
The JEIDA card drive and floppy disk drive must match the system accordingly.
The first part of the SYSTEM.TXT is as follows.

```
[DRCAD]: Card Drive Directory
C:
[DRFDD]: Floppy Disk Directory
A:
[NEXE]: umber of exe
8
[EXE1T]
Read Card Data
[EXE1E]
CARDTI
```

And,
C: after [DRCAD: Card Drive Directory] shows that the Card Drive is C.
This C: is used as the JEIDA Card drive.

A: after [DRFDD]: Floppy Disk Directory shows the floppy drive. Change if necessary.

Do not change the letters within [xxxxxxx]. [must be the left end. The corresponding letters must be the next line of [xxxx] and should be without spaces. This is same for STATION.TXT.

- STATION.TXT edit

STATION.TXT includes each station name, each logger number, and each channel name.
These must match the system.
The first part of STATION.TXT is as follows.

[N1STN]: Number 1 station name
Alpha
[S1LG1] : Number 1 station Logger-1 Number
0001
[S1LG2] : Number 1 station Logger-2 Number
0002
[N2STN]: Number 2 station name
Blabo
[S2LG1] : Number 2 station Logger-1 Number
2023
[S2LG2] : Number 2 station Logger-2 Number
0987
[N3STN]: Number 3 station name
Chary
[S3LG1] : Number 3 station Logger-1 Number
0001
[S3LG2] : Number 3 station Logger-2 Number
0002
[C110N] : Number 1 station Logger-1 Ch 0 name
SB50
[C111N] : Number 1 station Logger-1 Ch 1 name
WL50

And,

[N1STN]: Number 1 Station Name

Station 1 name comes after this.

[S1LG1]: Number 1 Station Logger-1 Number

Number 1 Station Logger-1 Number comes after this.

[C110N]: Number 1 Station Logger-1 Ch 0 Name

Number 1 Station Logger-1 Ch 0 Name comes after this.

Change each name. The order is different from that of installation, therefore please edit without location error by referring to each comment.

- TCARD.BAT creation

Create TCARD.BAT for start-up file.
The installed drive is current; create batch to start TMENU.

Example

```
CD C: \LOGGER
C:
TMENU
```

- CONFIG.SYS addition

Add the following line to CONFIG.SYS.

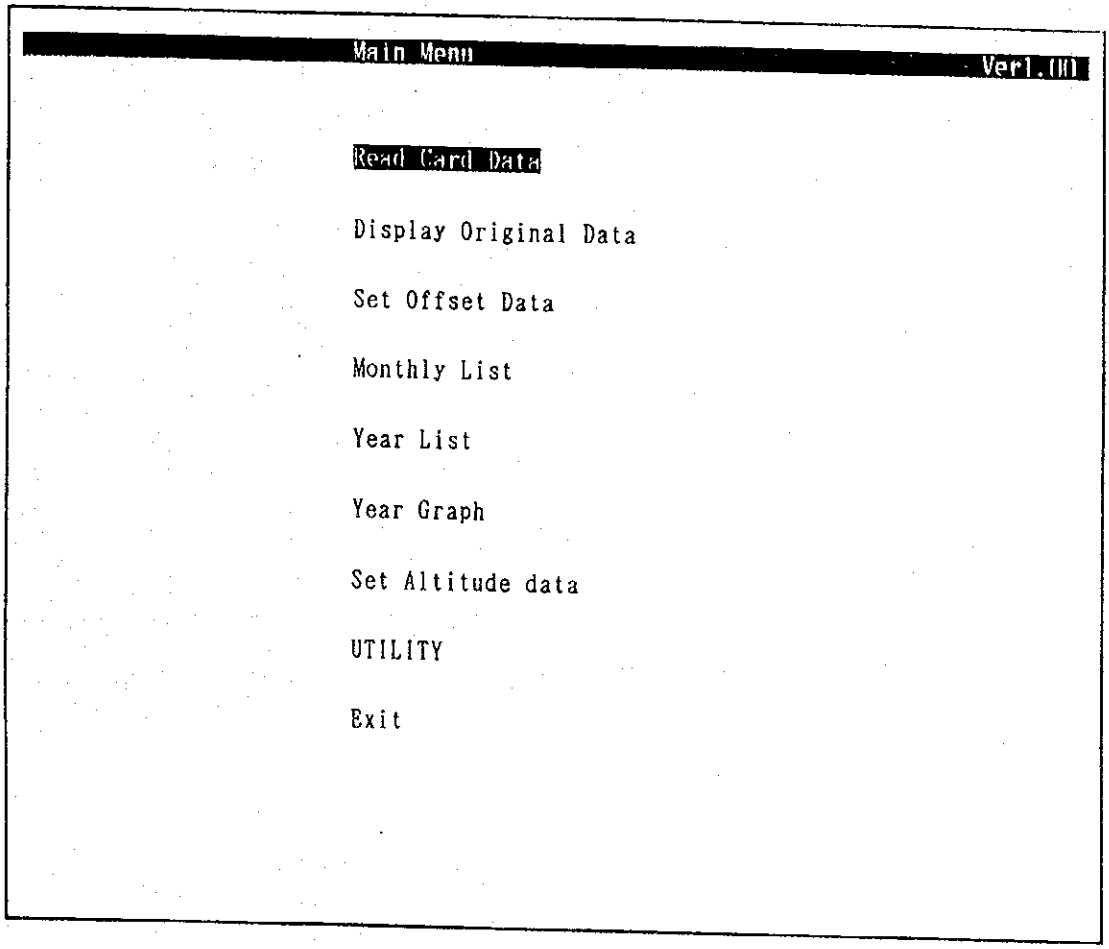
```
DEVICE = NECPRT1.SYS
```

[Program Start Up and Operation Explanations]

After turning the power ON or resetting, execute TCARD RETURN or TMENU RETURN as the installed directory is the current directory.

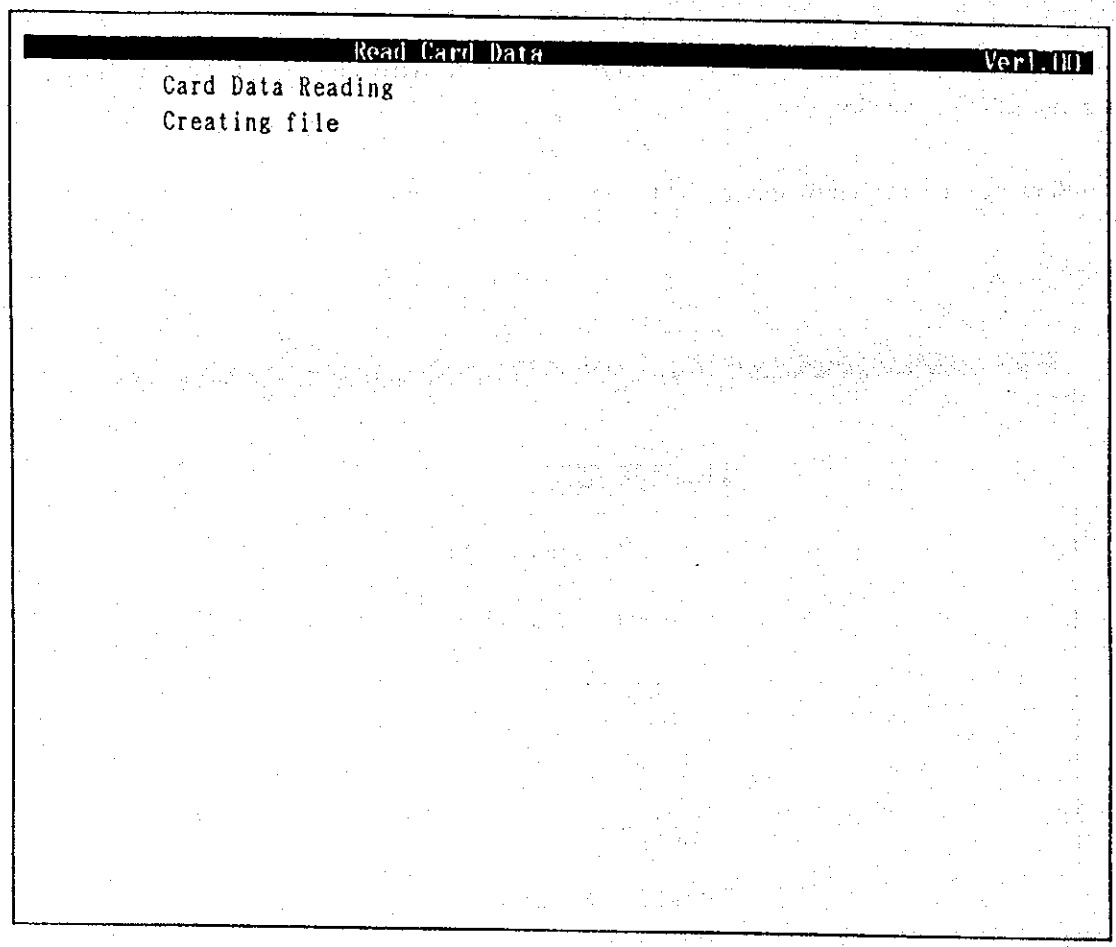
The following screen will be displayed next.

• Main Menu



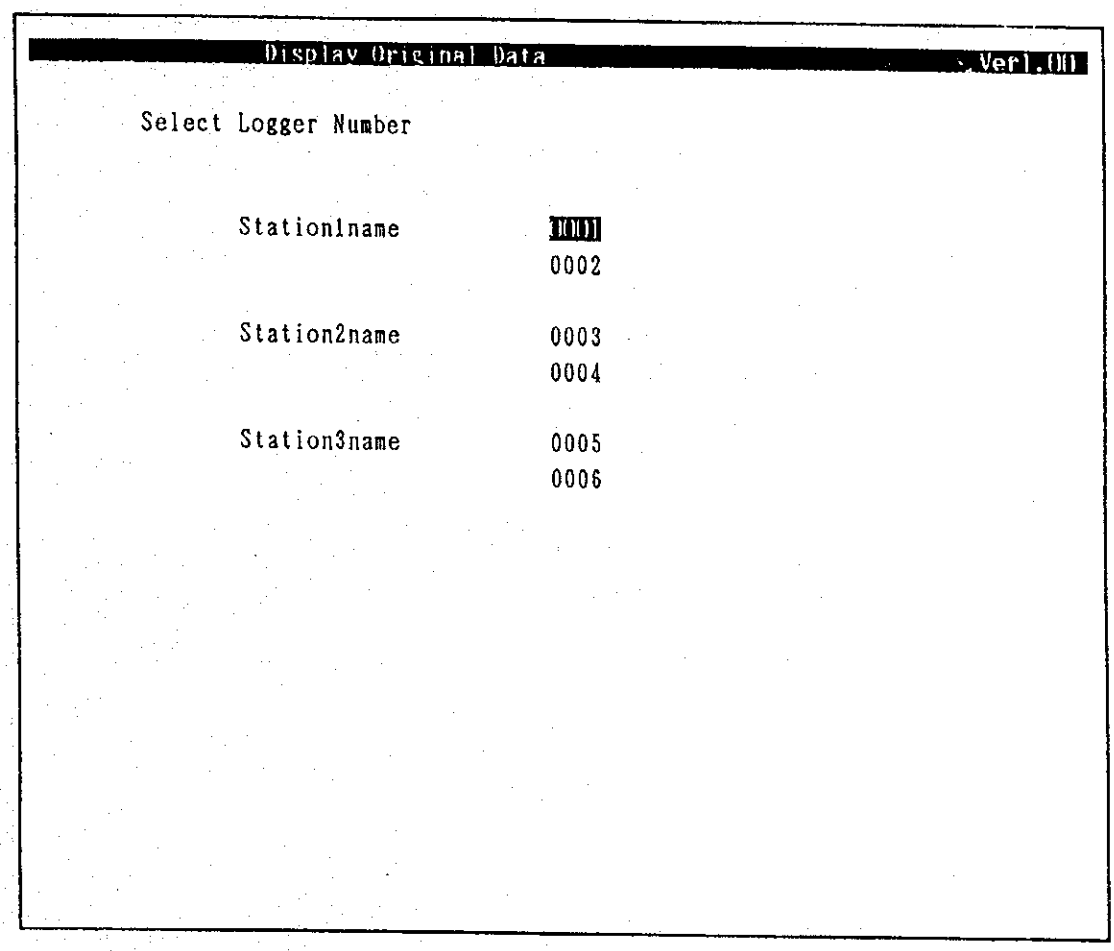
This is the Main Menu screen after the program start up.
Move to the items which you wish to execute by using the "arrow keys", and start each process by pressing the RETURN key.

• Read Card Data

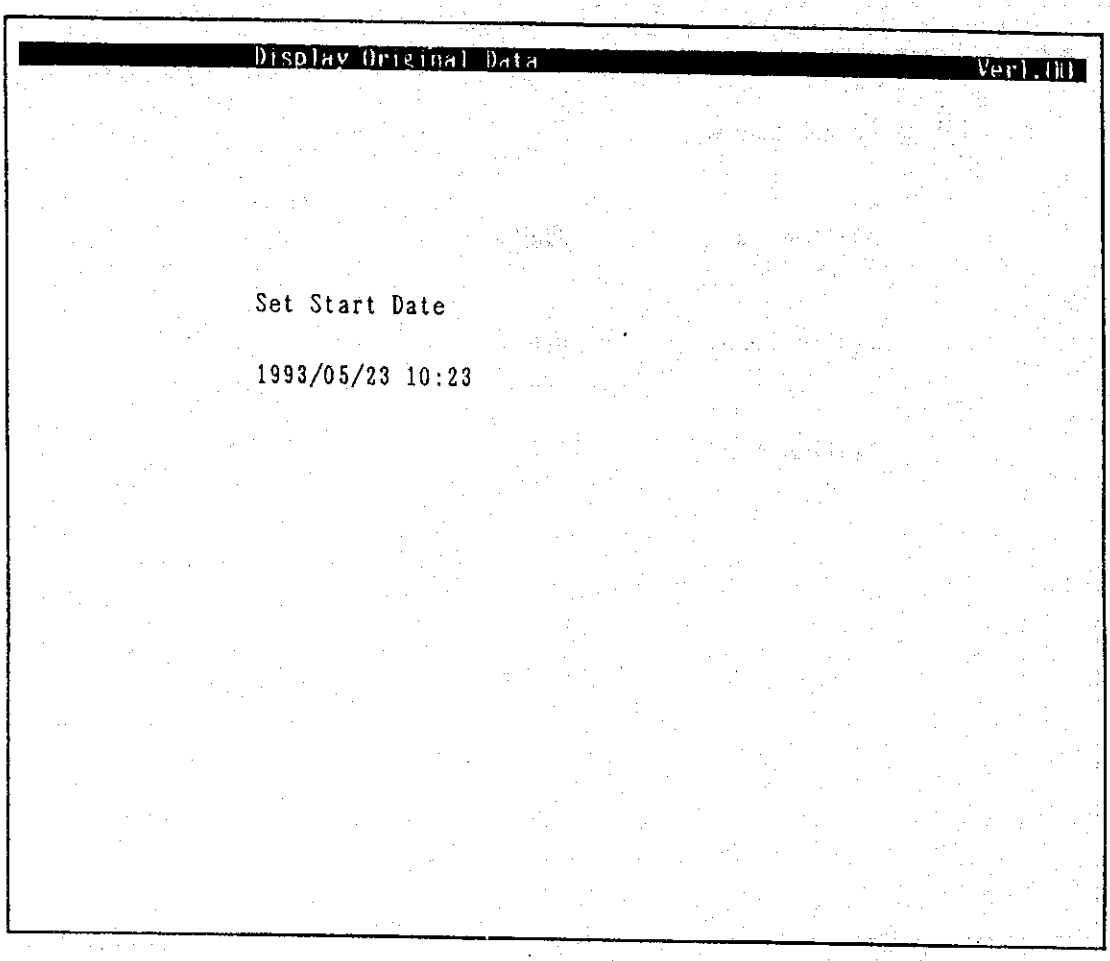


When selecting Read Card Data, data is read from the card drive. The data of the Logger number will be added to the original data file.

• Display Original Data



When selecting Display Original Data, the Logger selection screen will be displayed. Move to the Logger number to view the desired original data by using the "arrow keys", and press the RETURN key. The screen will return to the Main Menu by pressing the ESC key or the EXEC key.



Enter starting Date and Time after this. The next screen displays dates starting from the first assigned date and time. Dates beyond the current year are not displayed. Enter the date and time in numbers which you would like to place first, and press the RETURN key. If there is no date after the assigned date, the first date of the year is displayed.

Moving is possible by using the "arrow keys".

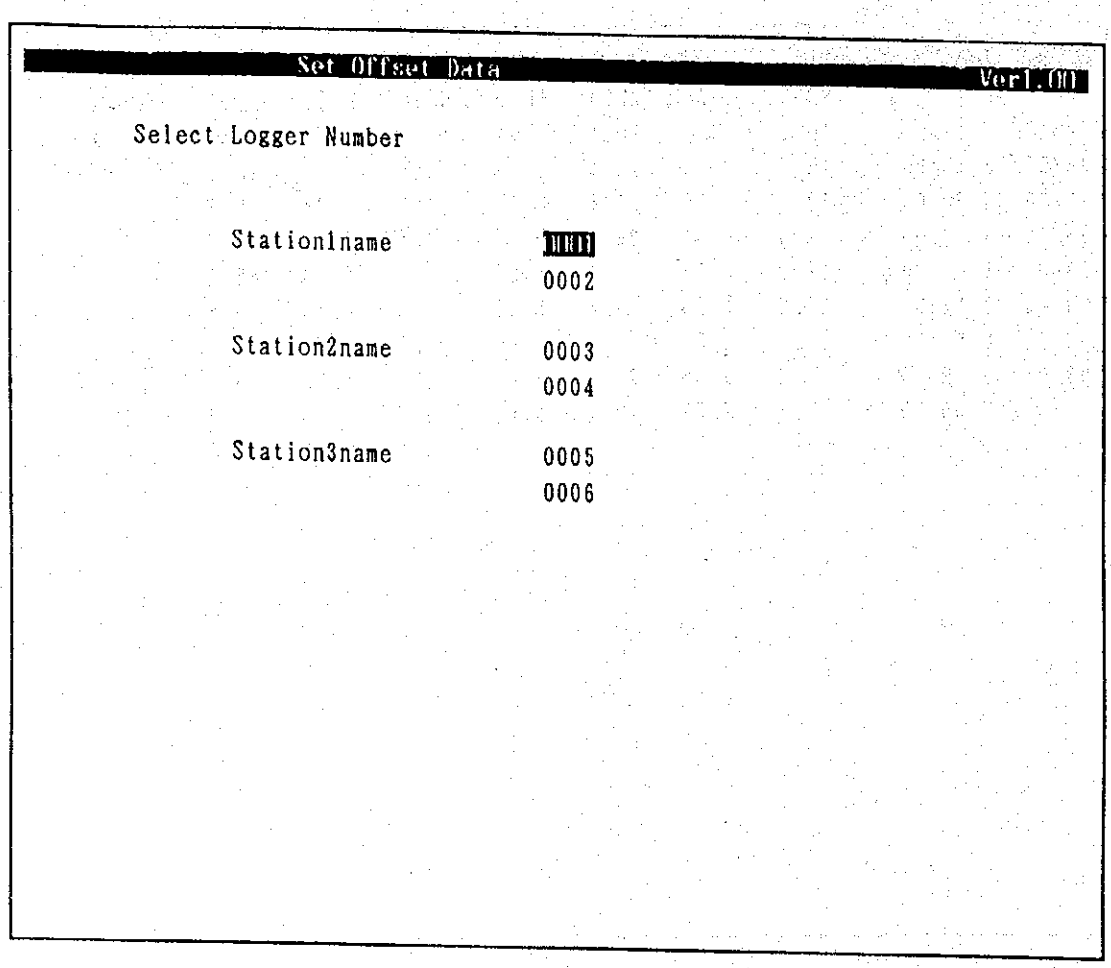
The screen will return to the Logger Selection Screen by the pressing the ESC key. The screen will return to the Main Menu by pressing the EXEC key.

Display Original Data Ver1.00

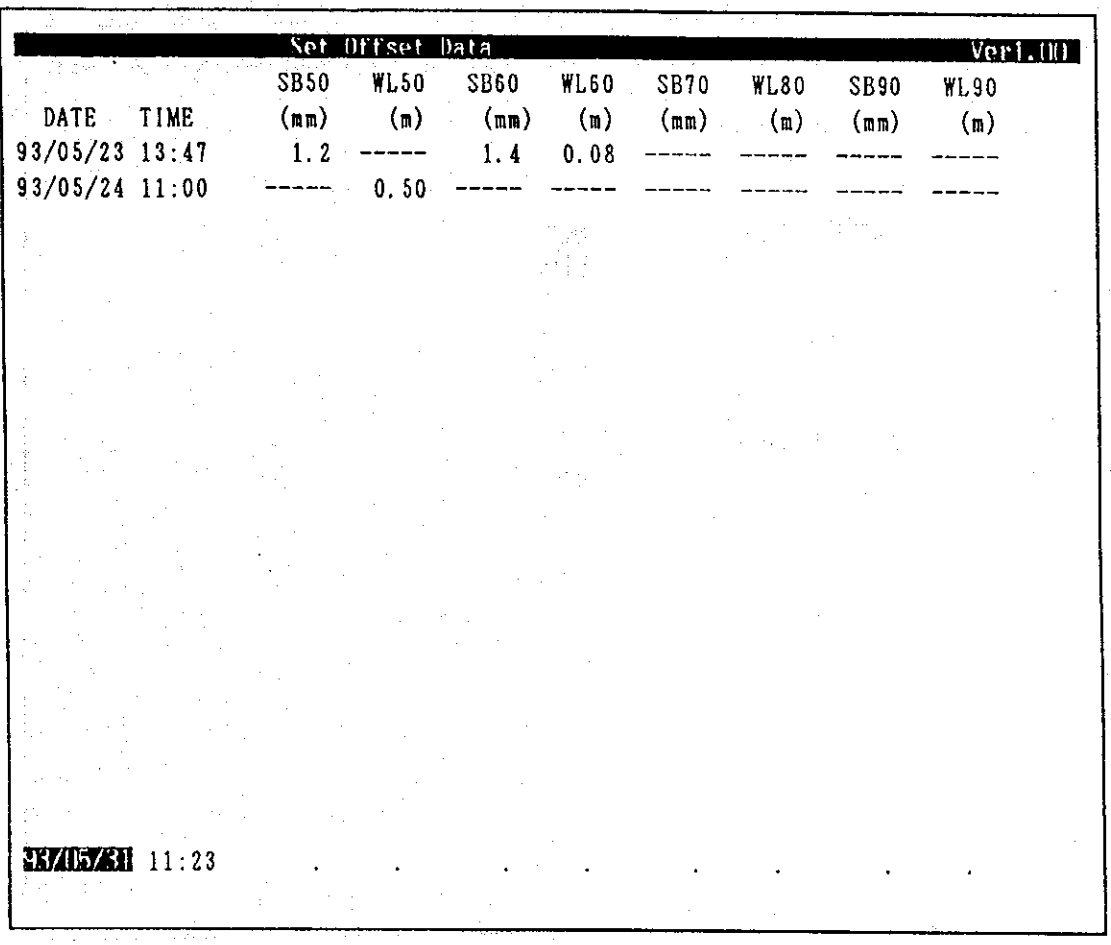
DATE	TIME	SB50 (mm)	WL50 (m)	SB60 (mm)	WL60 (m)	SB70 (mm)	WL80 (m)	SB90 (mm)	WL90 (m)
93/05/23	12:00	12.3	4.56	23.4	5.67	34.5	6.78	45.6	7.89
93/05/24	00:00	12.3	4.56	23.4	5.67	34.5	6.78	45.6	7.89
93/05/24	12:00	12.3	4.56	23.4	5.67	34.5	6.78	45.6	7.89
93/05/25	00:00	12.3	4.56	23.4	5.67	34.5	6.78	45.6	7.89
93/05/25	12:00	12.3	4.56	23.4	5.67	34.5	6.78	45.6	7.89
93/05/26	00:00	12.3	4.56	23.4	5.67	34.5	6.78	45.6	7.89
93/05/26	12:00	12.3	4.56	23.4	5.67	34.5	6.78	45.6	7.89
93/05/27	00:00	12.3	4.56	23.4	5.67	34.5	6.78	45.6	7.89

Half of the page on the screen can be changed by using the "arrow keys".
PREV and NEXT keys change the whole screen.
The screen returns to the Set Start Data screen by pressing the EXEC key.
The screen will return to the Main Menu by pressing the EXEC key.

• Set Offset Data



When selecting Set Offset Data, the Logger Selection screen will be displayed first.
Move to the logger number on which you wish to enter offset by using the "arrow keys", and press the RETURN key.
The screen will return to the Main Menu by pressing the ESC key or the EXEC key.



The corrective data which has been set will be displayed and the entry column will be displayed underneath. Enter change over date and time of the corrective data for the year, month, date, hour, and minute entry. Moving is possible by using the "arrow keys".

The number data of the each channel is eject entry. The letter entered at the right end will be displayed and previous entry will move to the left. The right end letter is deleted by pressing the BS key or the DEL key, and the remaining letters move one letter to the right.

For example, when entering 0.5 for subsidence, enter 0 5.

Numbers and - can be used. Move to the following channel by using the "arrow keys". The channels, which do not require correction during this time, remain blank.

If the channels remain blank, this time will be ignored and the latest corrected values before the blank will be used.

Enter by pressing the RETURN key and confirm the addition of the displayed screen.

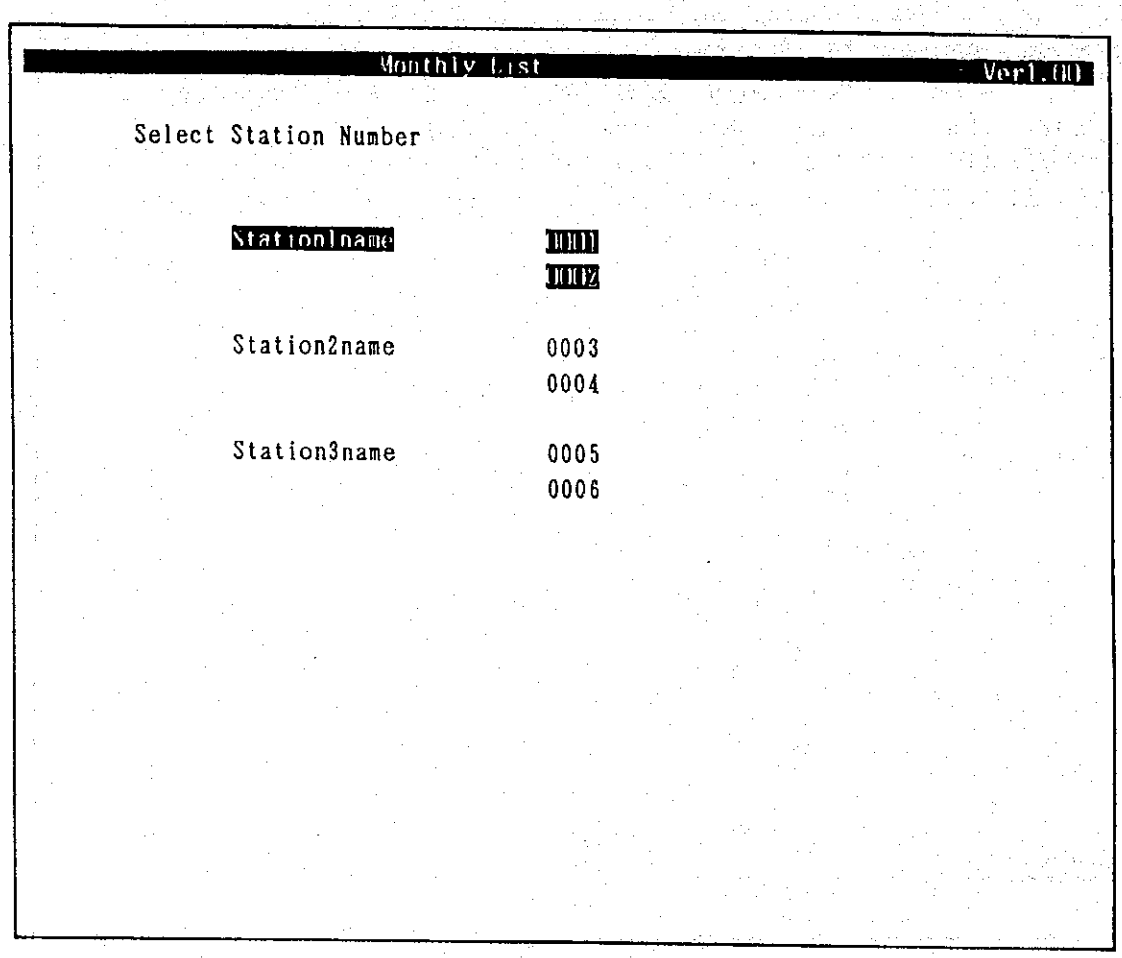
If the data of the same date and time is re-entered as the same date and time, the date will be changed to the latter entry value.

Half of the page on the screen can be changed by using the "arrow keys" for the corrective date display. PREV and NEXT keys change the whole page on the screen.

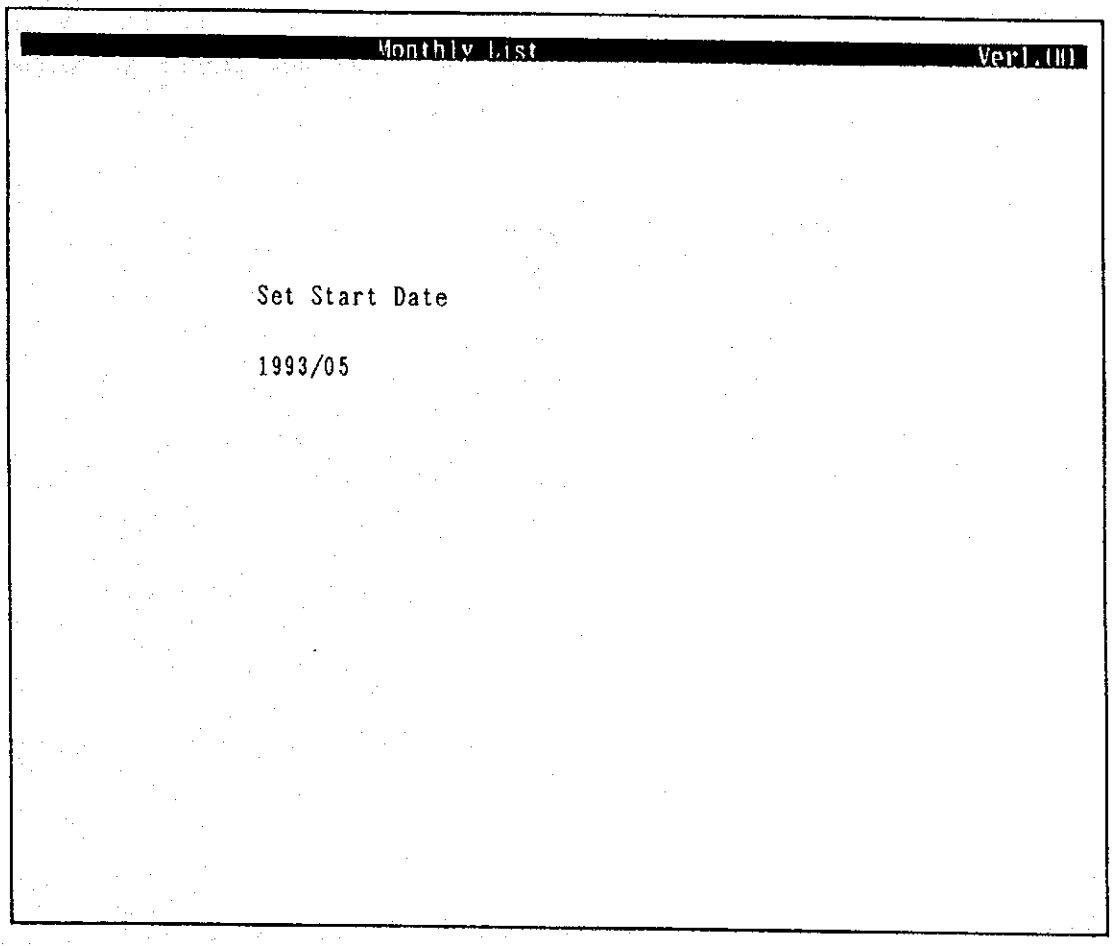
The screen will return to the Logger Selection Screen by pressing the ESC key.

The screen will return to the Main Menu by pressing the EXEC key.

• Monthly List



When selecting Monthly List, the station selection screen will be displayed.
Move to the station which you wish to print by using the "arrow keys", and press the RETURN key.
The screen will return to the Main Menu by pressing the ESC key or the EXEC key.



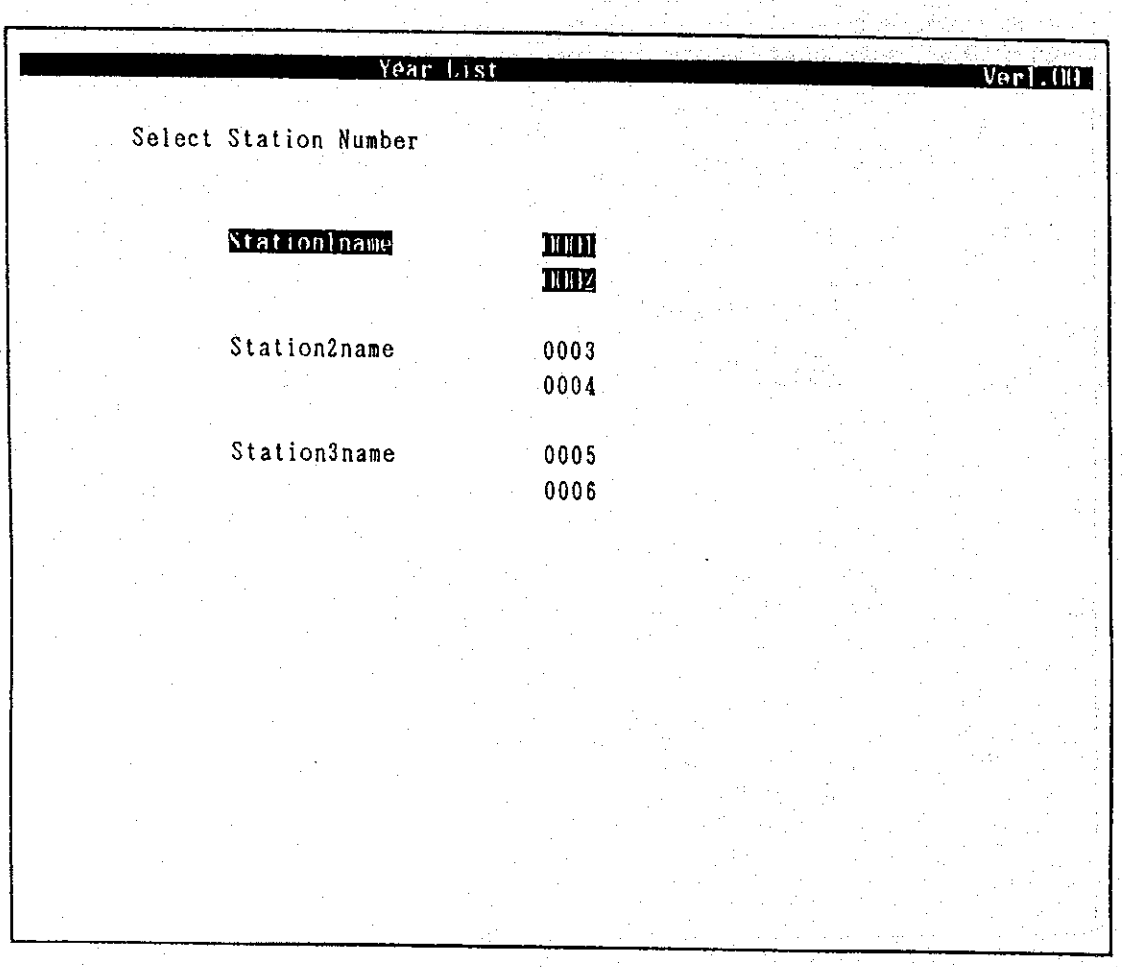
Enter year and month next. The data of the assigned year and month is the monthly chart. Enter year and month in numbers, and press the RETURN key. Printing will begin after searching.

Moving is possible by using the "arrow keys".

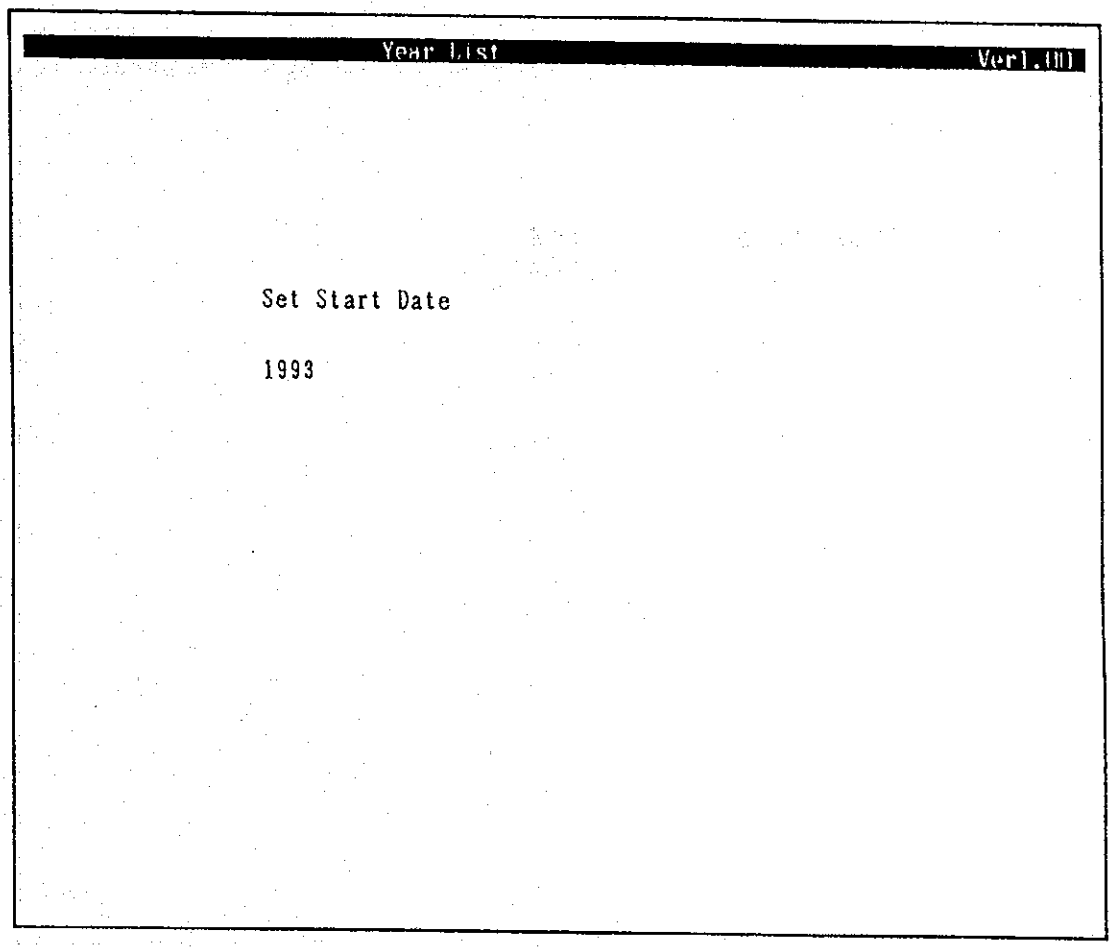
The screen will return to the Station Selection by pressing the ESC key.

The screen will return to the Main Menu by pressing the EXEC key.

• Year List



When selecting Year List, the Station Selection screen will displayed.
Move to the station which you wish to print by using the "arrow keys", and press the RETURN key.
The screen will return to the Main Menu by pressing the ESC key or the EXEC key.



Enter the year next.

The data of the assigned year is the year chart. Enter the year in numbers, and press the RETURN key.

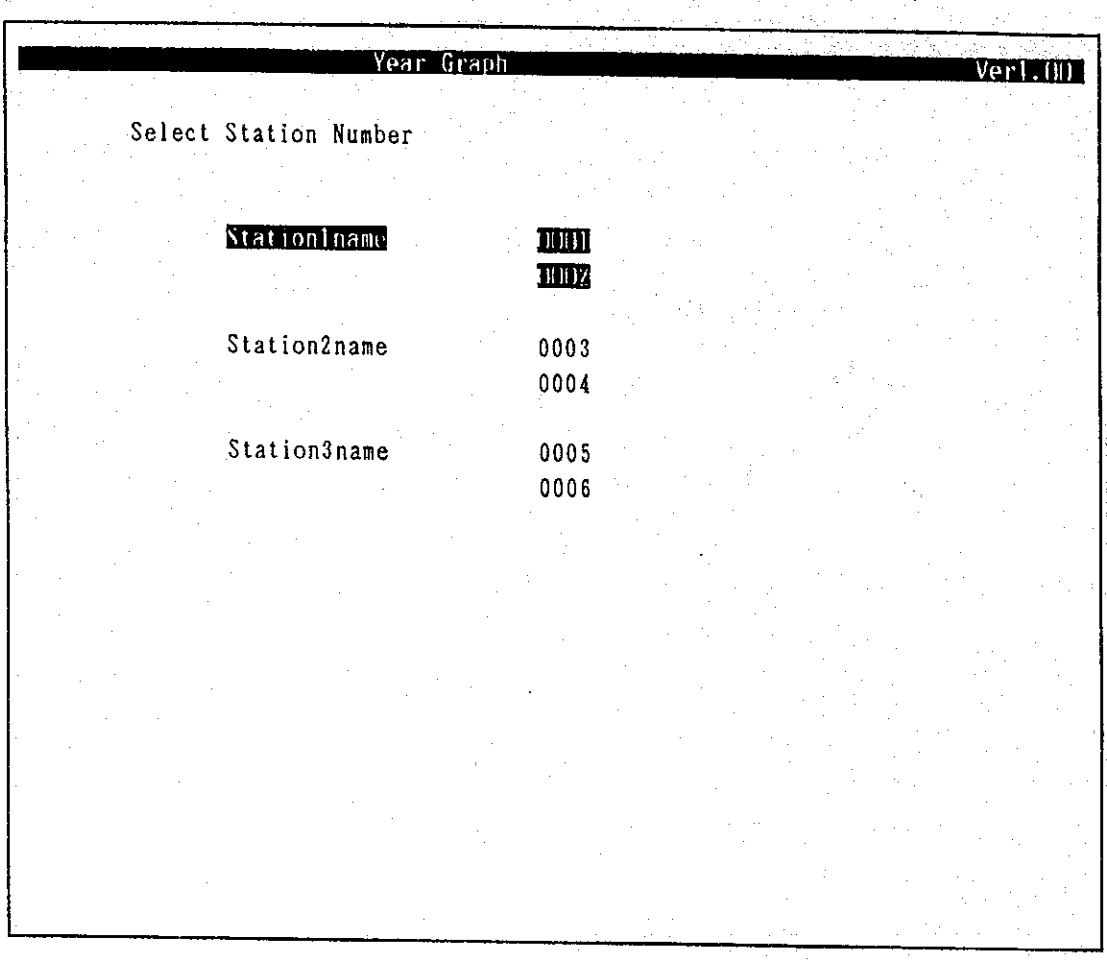
Printing will begin after searching.

Moving is possible by pressing the "arrow keys".

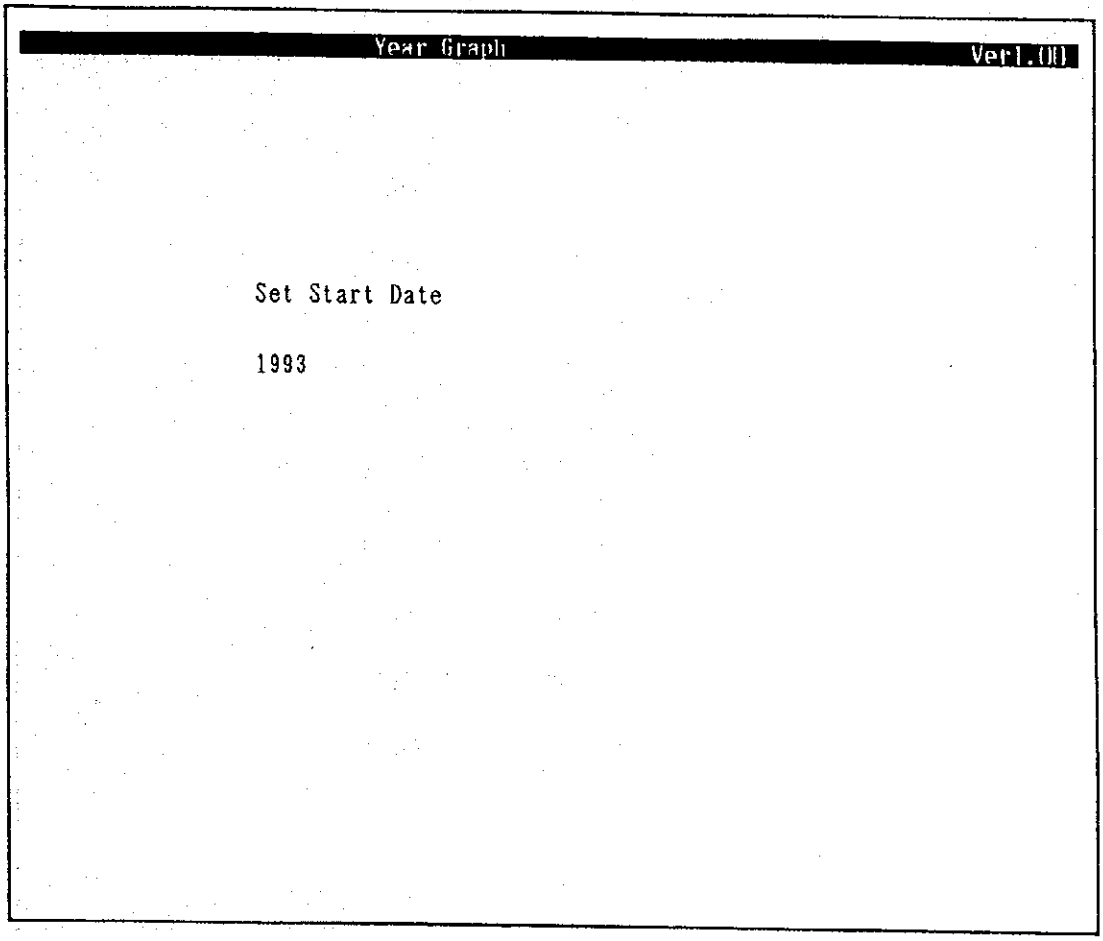
The screen will return to the Station Selection by pressing the ESC key.

The screen will return to the Main Menu by pressing the EXEC key.

• Year Graph



When selecting Year Graph, the Station Selection screen will be displayed.
Move to the station which you wish to print by pressing the "arrow keys", and press the RETURN key.
The screen will return to the Main Menu by pressing the ESC key or the EXEC key.

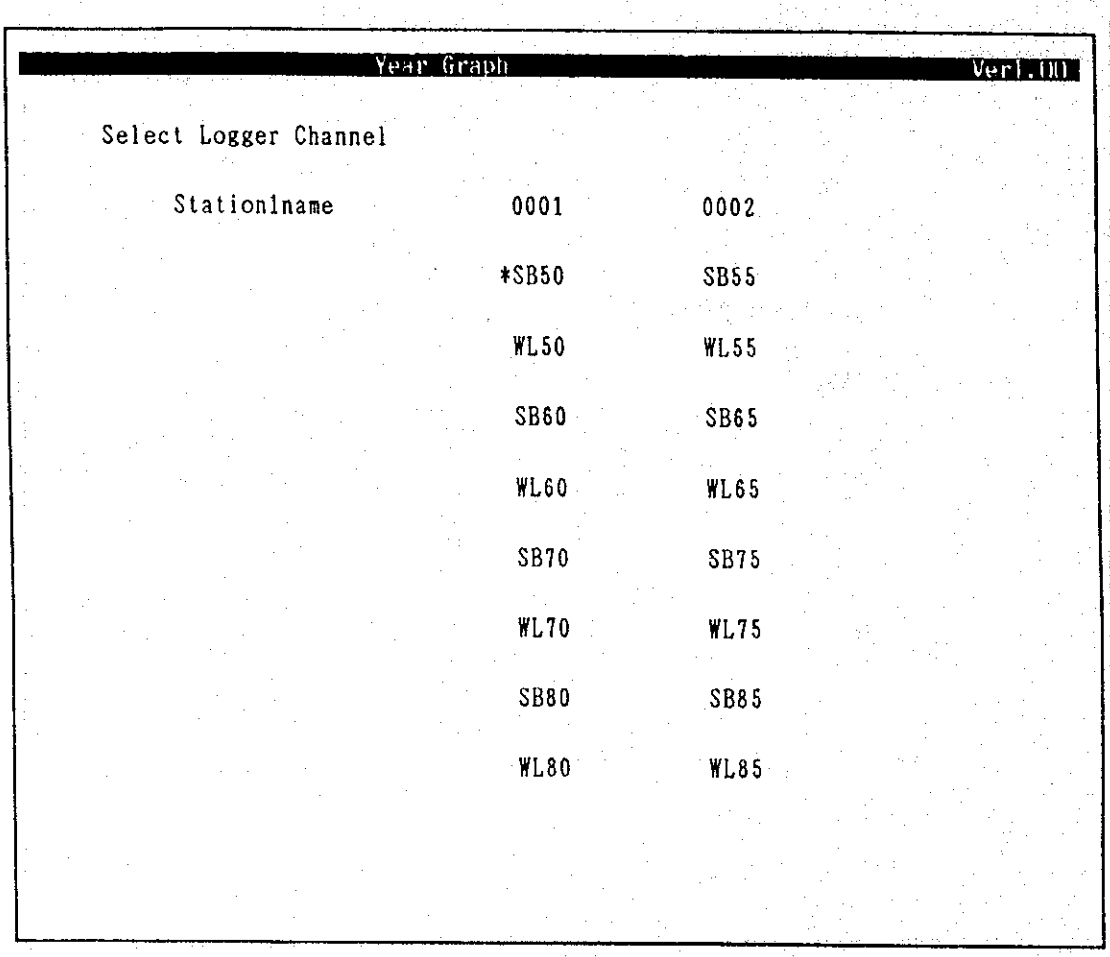


Enter the year next. Create a graph of the assigned year's data. Enter the year in numbers, and press the RETURN key.

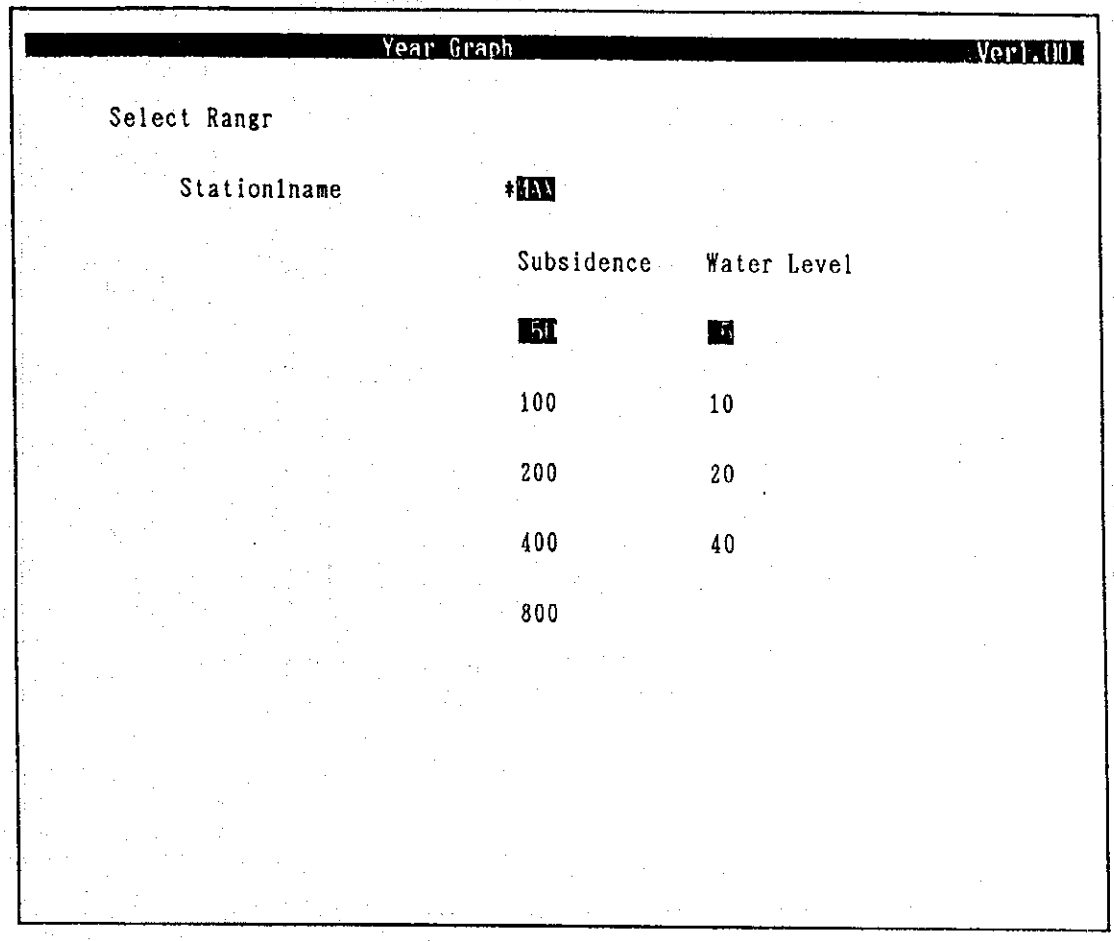
Moving is possible by pressing the "arrow keys".

The screen will return to the Station Selection by pressing the ESC key.

The screen will return to the Main Menu by pressing the EXEC key.



The channel selection screen will be displayed next. Up to 8 channels can be selected for 1 station.
The channel name with * will be displayed reversely and is selected by pressing the SPACE key. The reverse display and selection are cancelled by pressing the SPACE key again.
Move * with the "arrow keys".
Enter by pressing the RETURN key and move to the next screen.
The screen will return to the Year Entry Screen by pressing the ESC key.
The screen will return to the Main Menu by pressing the EXEC key.



The Select Ranger screen will be displayed next.

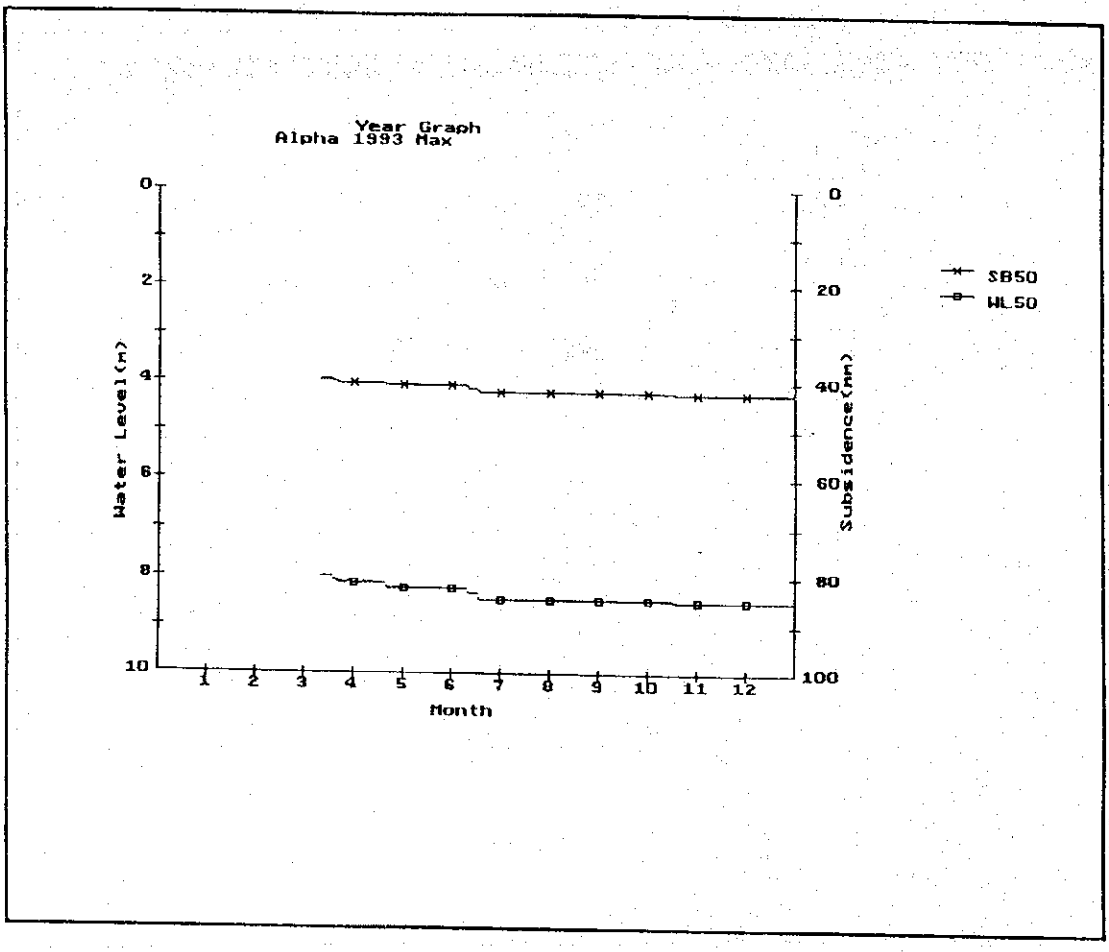
MAX means creating a graph of the MAX value for a day. MAX becomes MIN by pressing the SPACE key when * is at the location of MAX, and MIN becomes MAX when pressing the SPACE key.

Move * to the assigned range by the "arrow keys", and press the SPACE key. By doing this, the range will be displayed reversely and selected. If selecting another range, move to that range.

Enter by pressing the RETURN key, and the graph will be displayed after searching.

The screen will return to the Year entry screen by pressing the ESC key.

The screen will return to the Main Menu by pressing the EXEC key.



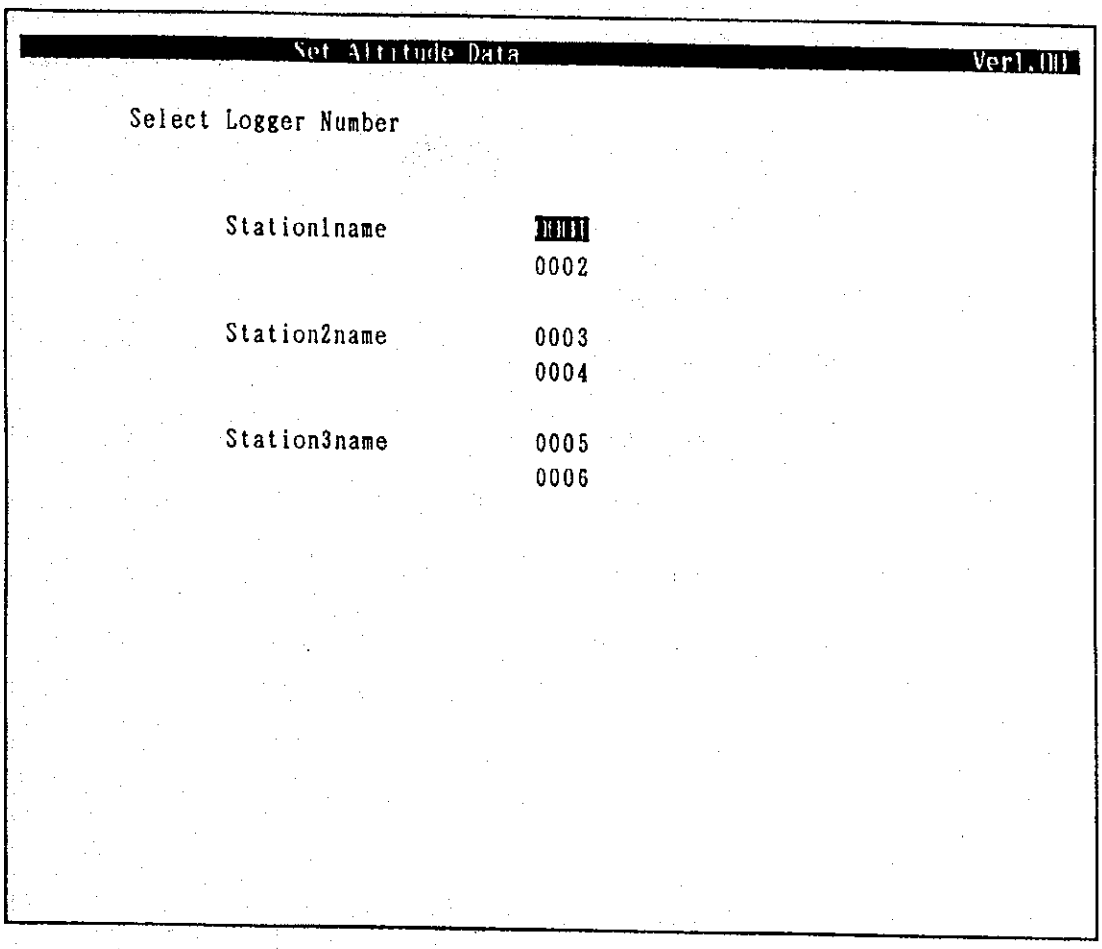
When a graph is displayed, the data is printed by pressing SHIFT + PrtSc.

In case of Scale Over, Ranger Over will be displayed.

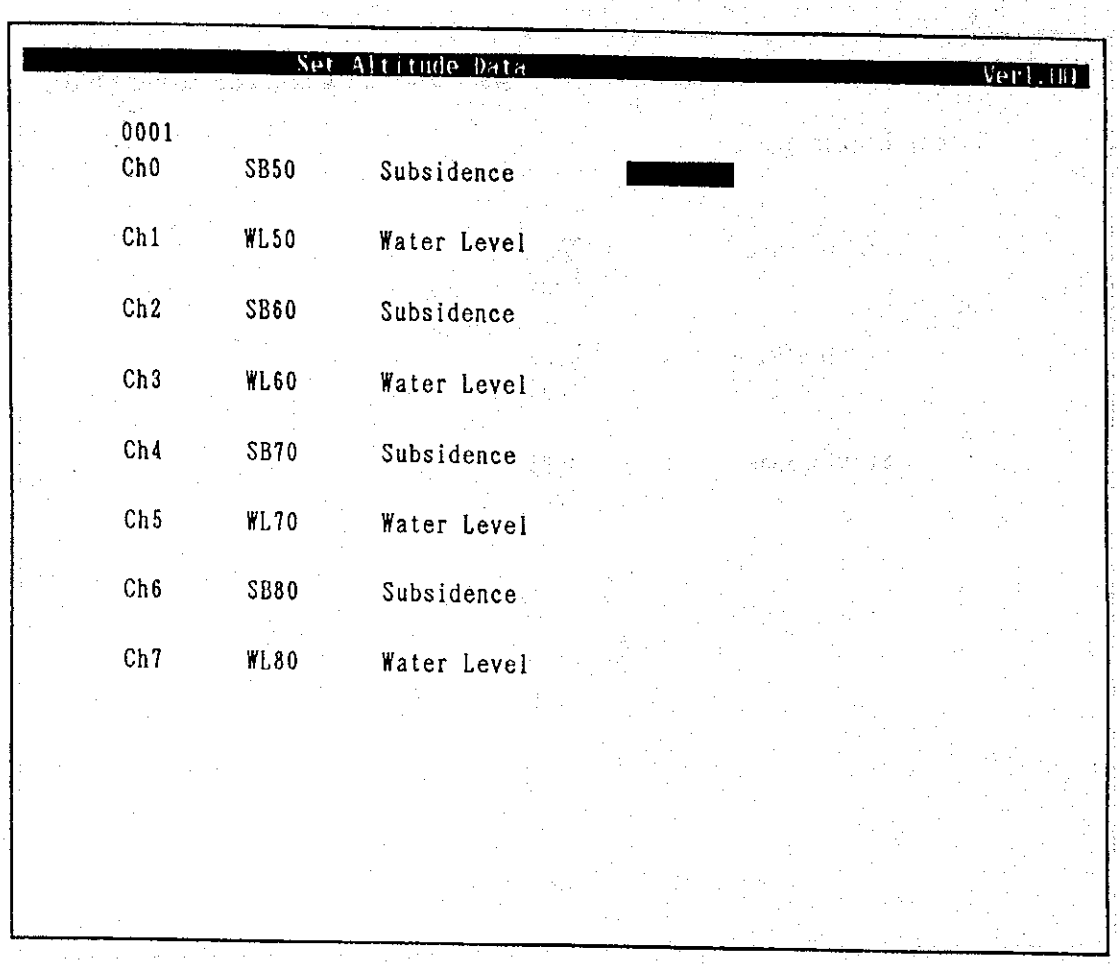
The screen will return to the Select Ranger screen by pressing the ESC key.

The screen will return to the Main Menu by pressing the EXEC key.

• Set Altitude Data

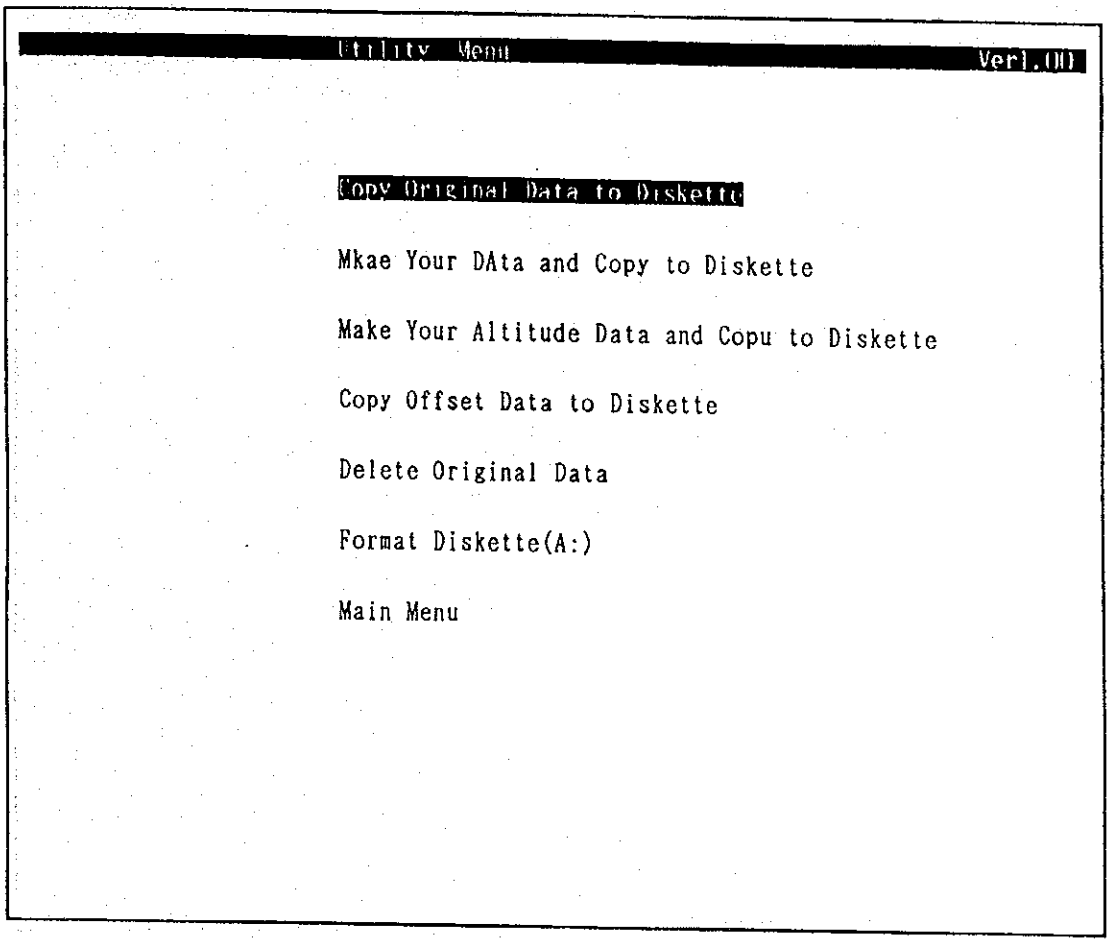


When selecting Set Altitude Data, the Logger Selection screen will be displayed. Move to the Logger where you wish to enter an altitude with "arrow keys", and press the RETURN key.
The screen will return to the Main Menu by pressing the ESC key or the EXEC key.



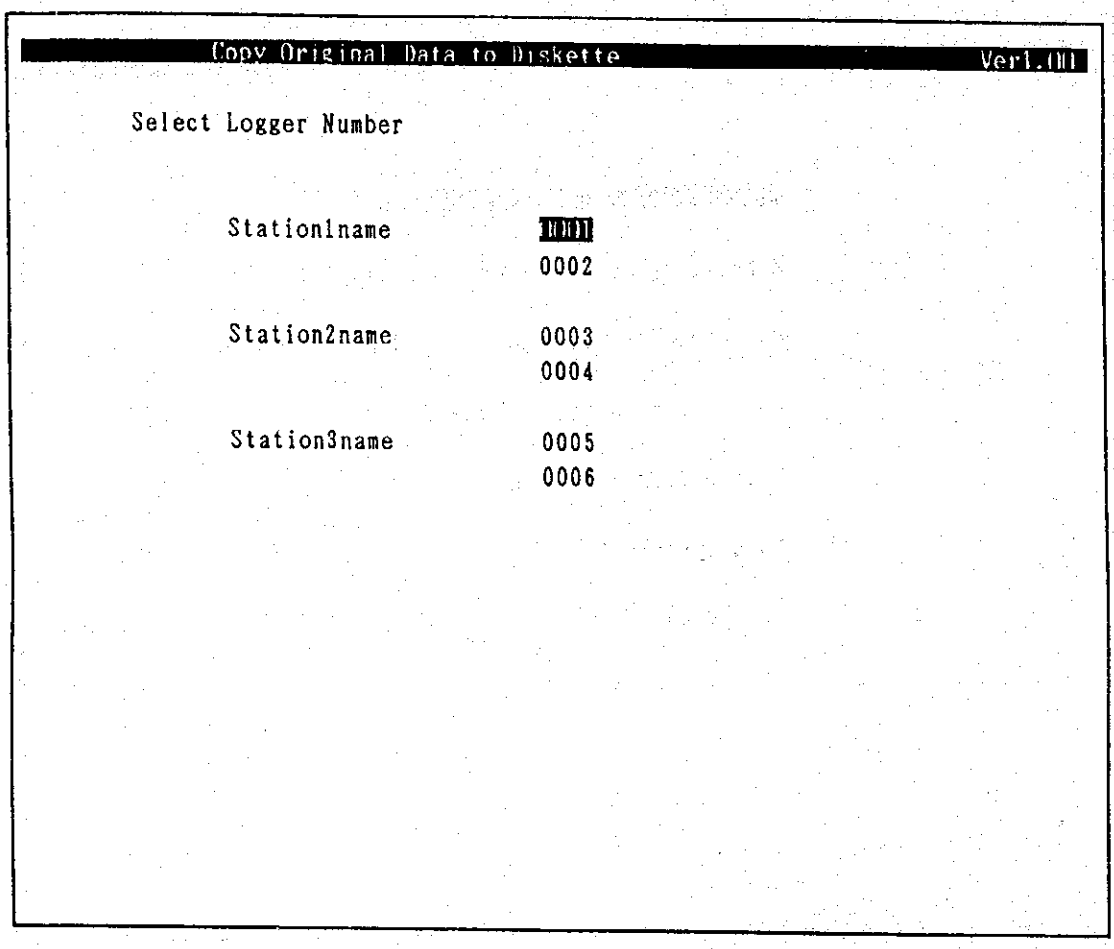
The altitude data which has been set will be displayed.
Moving is possible by using the "arrow keys".
The data in numbers is the eject entry. The letter entered at the right end will be displayed and the previous entry will move to the left. The right end letter is deleted by pressing the BS key or the DEL key, and the remaining letters will move one letter to the right.
For example, when entering 12 for subsidence, enter 1 2.
You can use numbers. Move to the next channel by using the "arrow keys".
If it remains blank the value will become 0.
Enter by pressing the RETURN key.
The screen will move to the Logger Selection Screen by pressing the ESC key.
The screen will return to the Main Menu by pressing the EXEC key.

• Utility

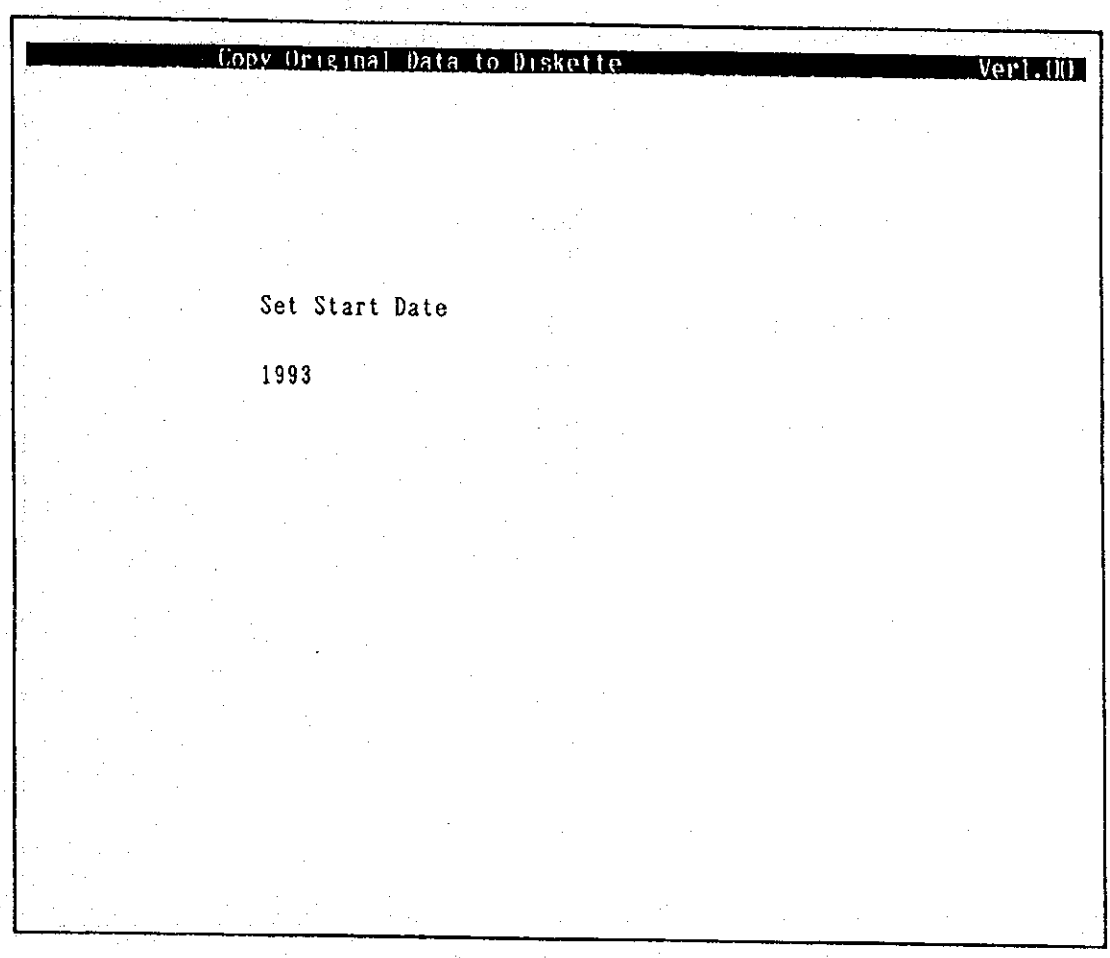


When selecting Utility, the Utility Menu will be displayed.
Move to the items which you wish to execute by using the "arrow keys", and press the RETURN key.

• Copy Original Data to Diskette

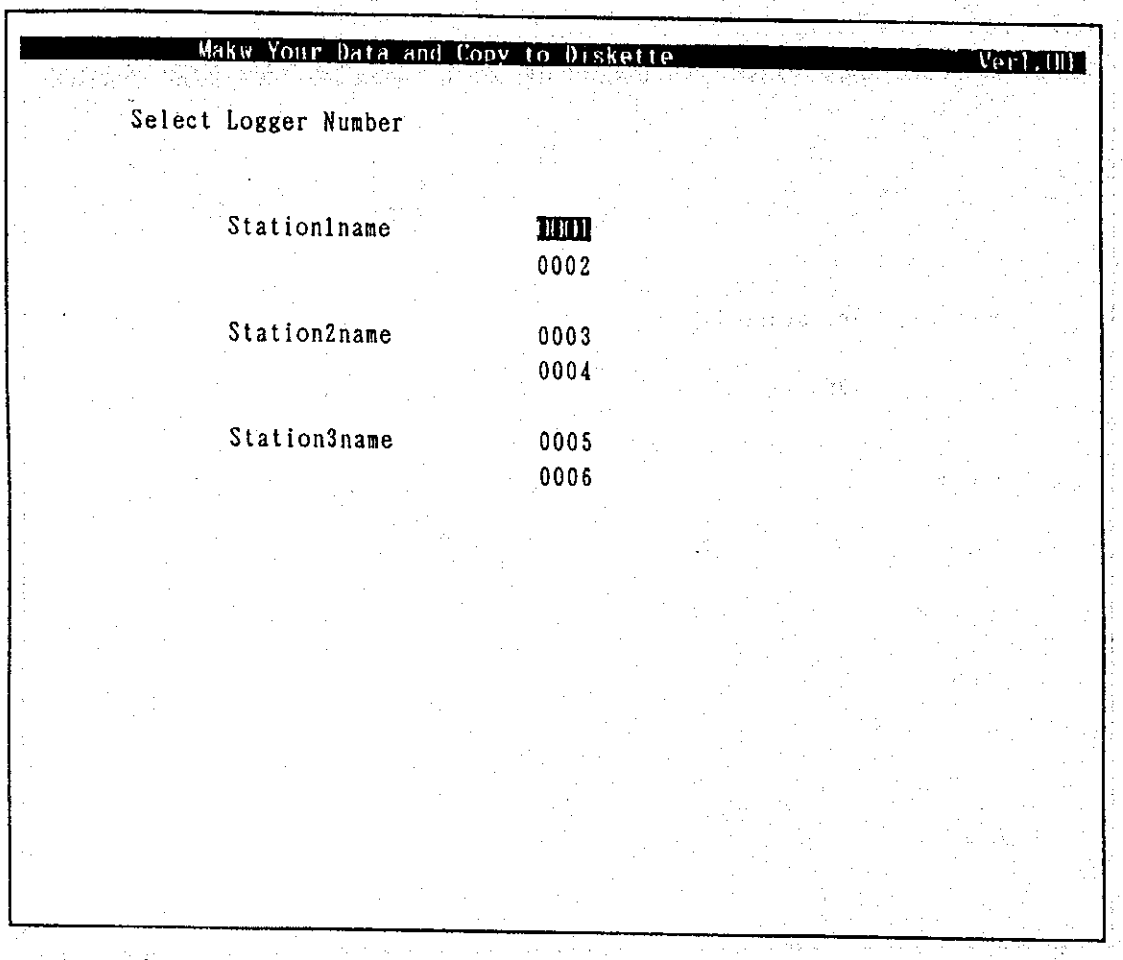


When selecting Copy Original Data to Diskette, the Logger Selection screen will be displayed.
Move to the logger number on which you wish to copy the original data by using the "arrow keys", and press the RETURN key.
The screen will return to the Utility Menu by pressing the ESC key or the EXEC key.



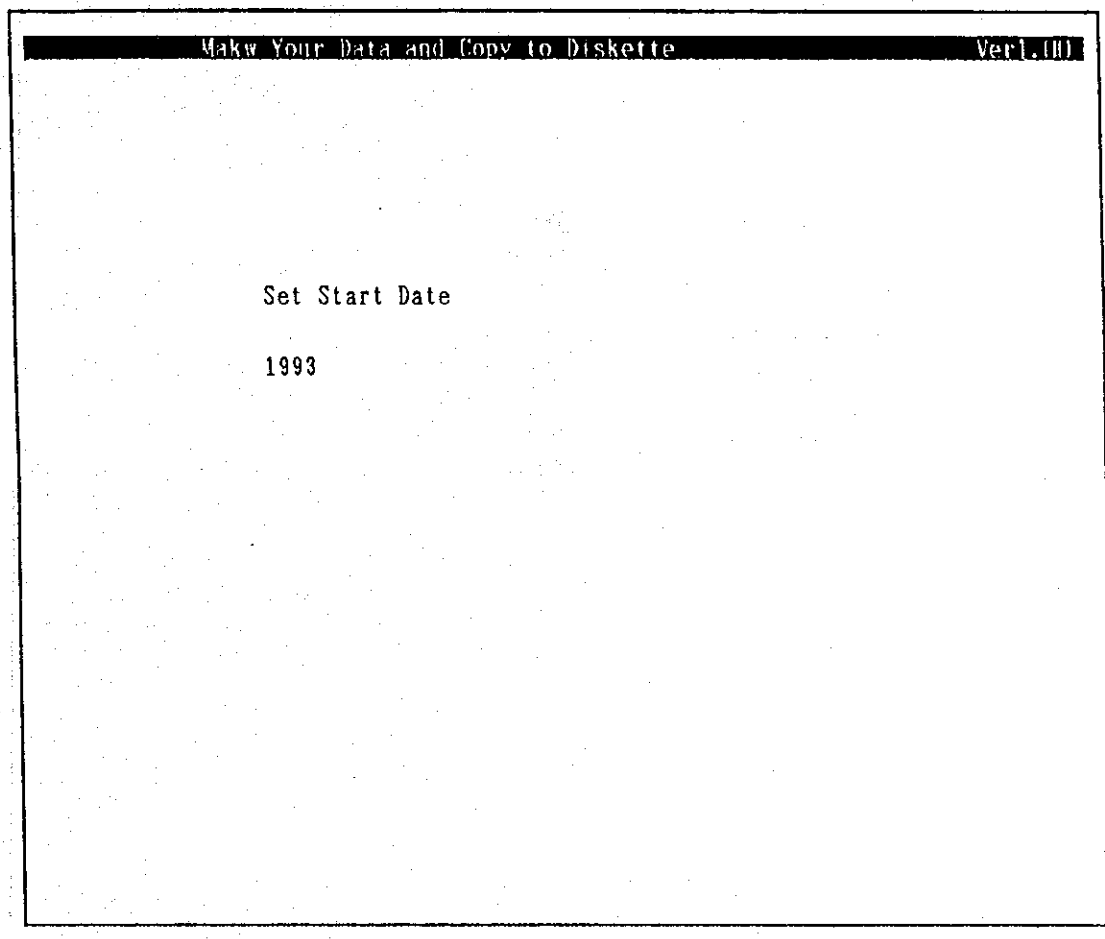
Enter the year next. Copy the original data of the assigned year to a floppy disk.
Start copying by entering the year in numbers, and press the RETURN key.
Moving is possible by using the "arrow keys".
The screen will return to Logger Selection by pressing the ESC key.
The screen will return to the Utility Menu by pressing the EXEC key.

• Make Your Data and Copy to Diskette



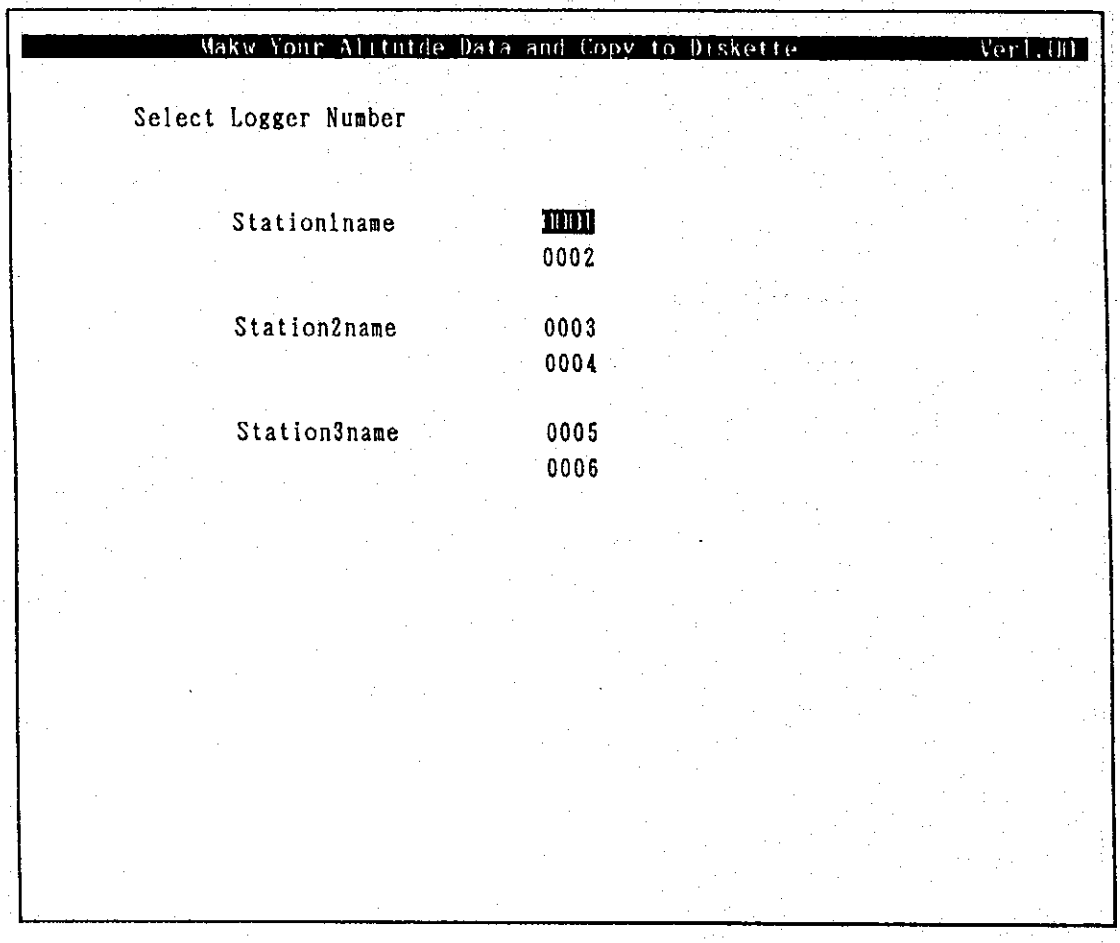
When selecting Make Your Data and Copy to Diskette, the Logger Selection screen will be displayed. Move to the logger number which is to be copied after corrective calculations with "arrow keys", and press the RETURN key.

The screen will return to the Utility Menu by pressing the ESC key or the EXEC key.



Enter the year next. Copy the data of the assigned year to a floppy disk after the corrective calculations.
Begin copying by entering the year in numbers, and press the RETURN key.
Moving is possible by using the "arrow keys".
The screen will return to the Logger Selection Screen by pressing the ESC key.
The screen will return to the Utility Menu by pressing the EXEC key.

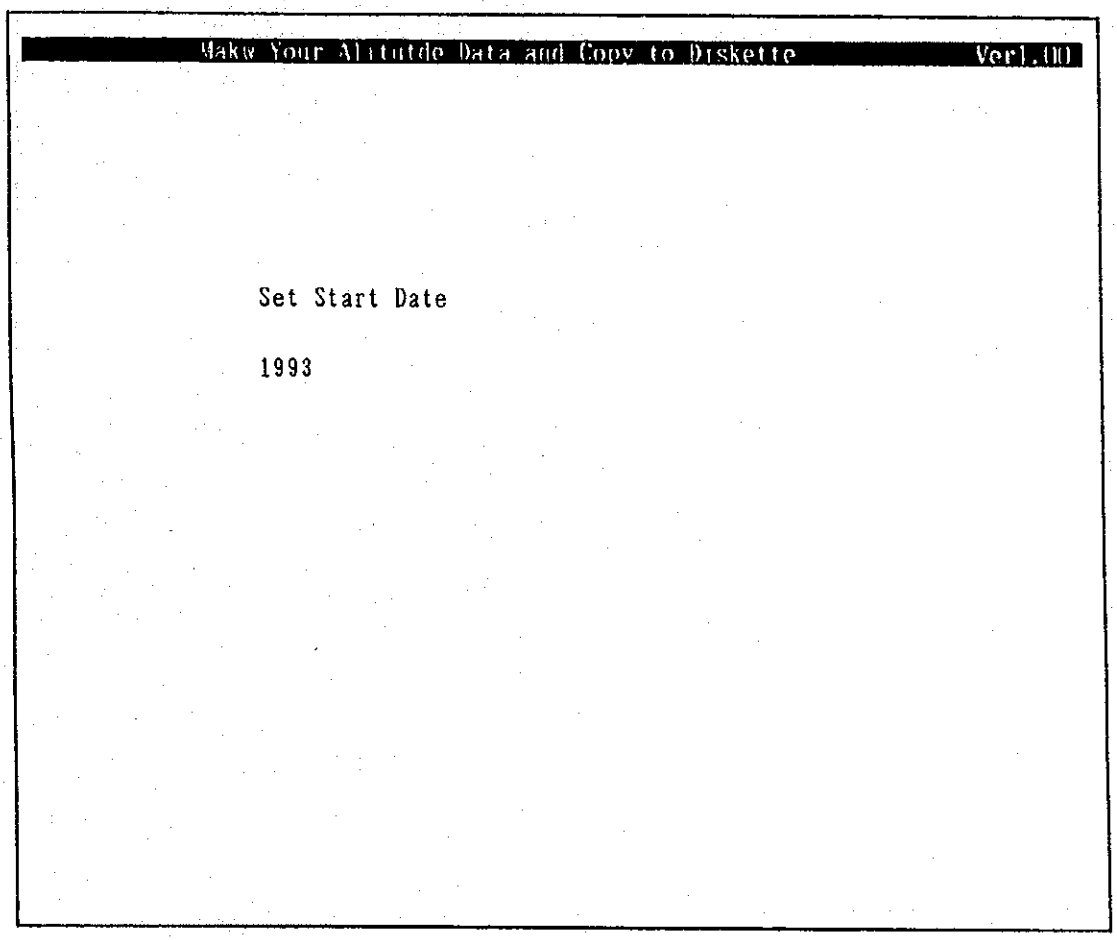
• Make Your Altitude Data and Copy to Diskette



When selecting Make Your Altitude Data and Copy to Diskette, the Logger Selection screen will be displayed.

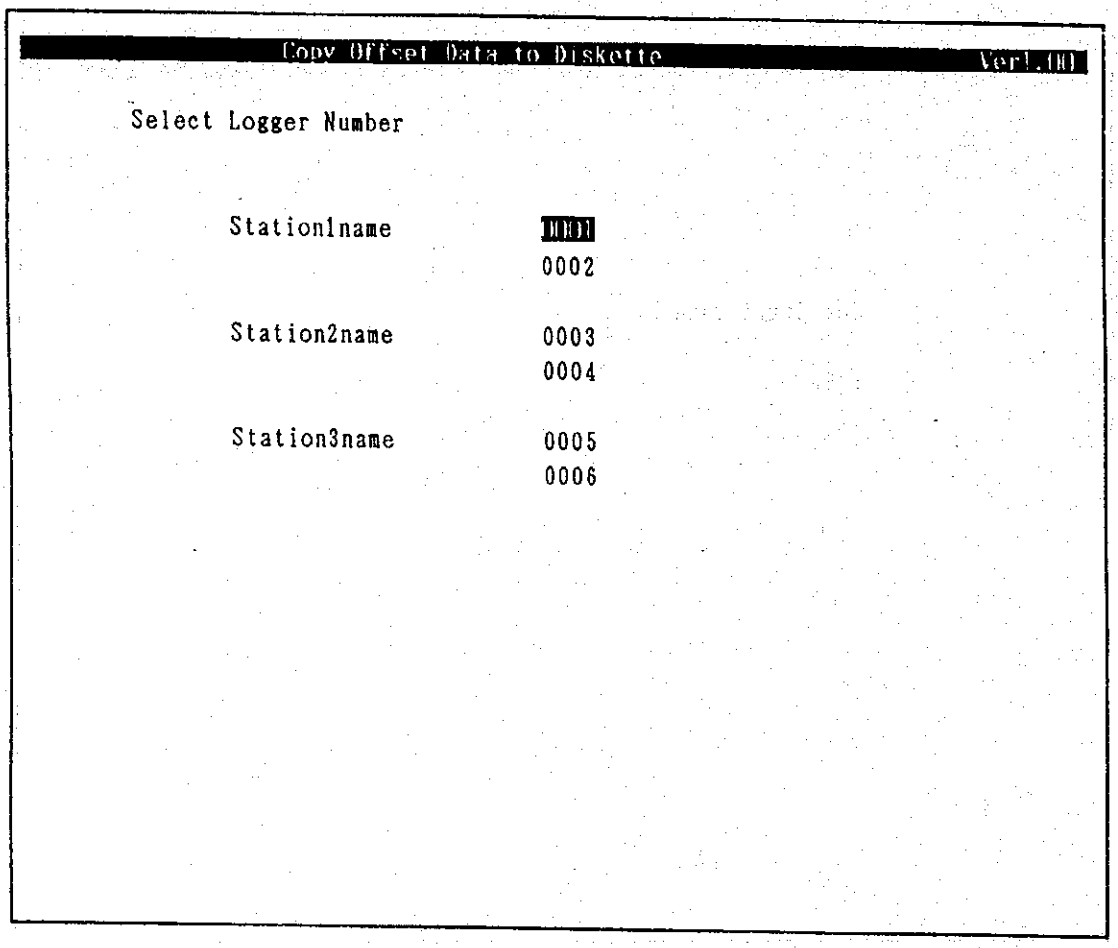
Move to the logger number which is to be copied after altitude corrective calculations with "arrow keys", and press the RETURN key.

The screen will return to the Utility Menu by pressing the ESC key or the EXEC key.



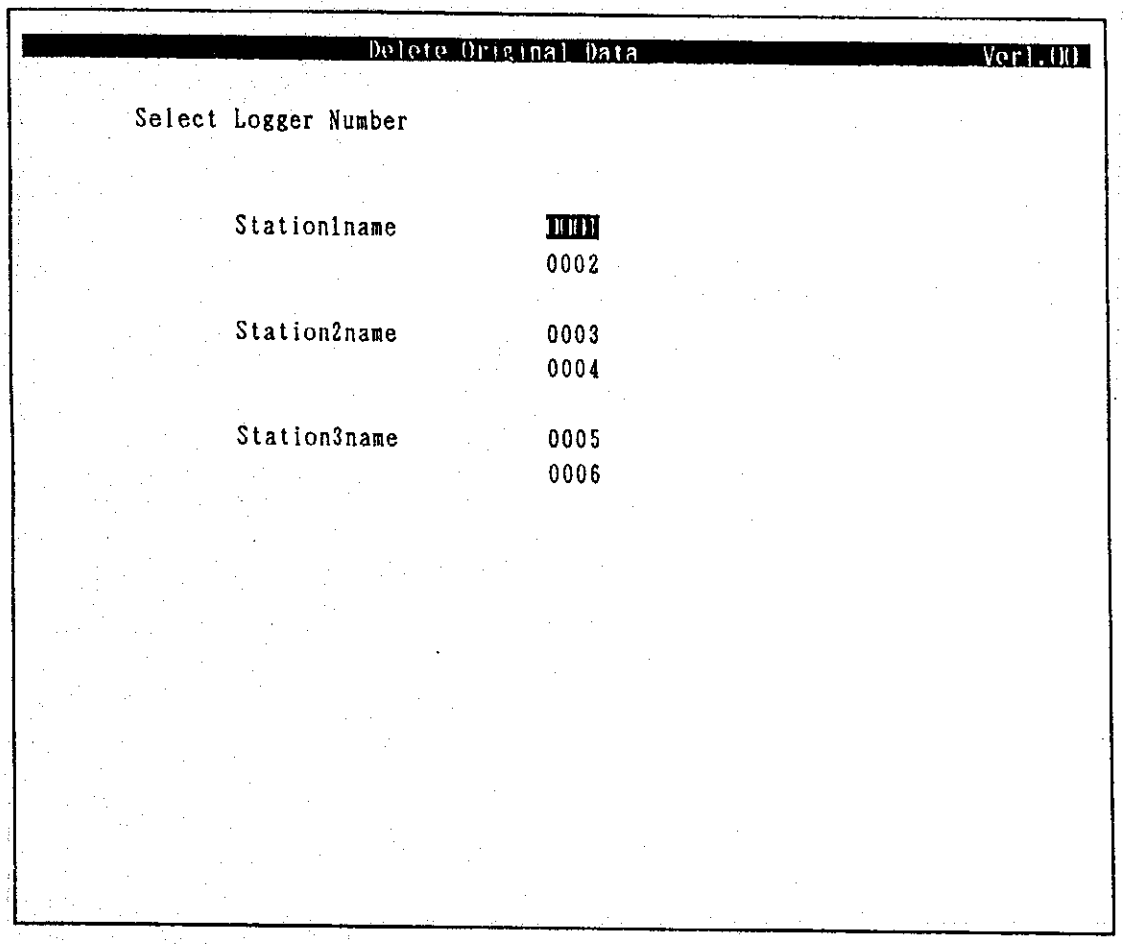
Enter the year next. Copy the date of the assigned year to a floppy after the altitude corrective calculation.
Begin copying by entering the year in numbers, and press the RETURN key.
Moving is possible by using the "arrow keys".
The screen will return to the Logger Selection Screen by pressing the ESC key.
The screen will return to the Utility Menu by pressing the EXEC key.

• Copy Offset Data to Diskette

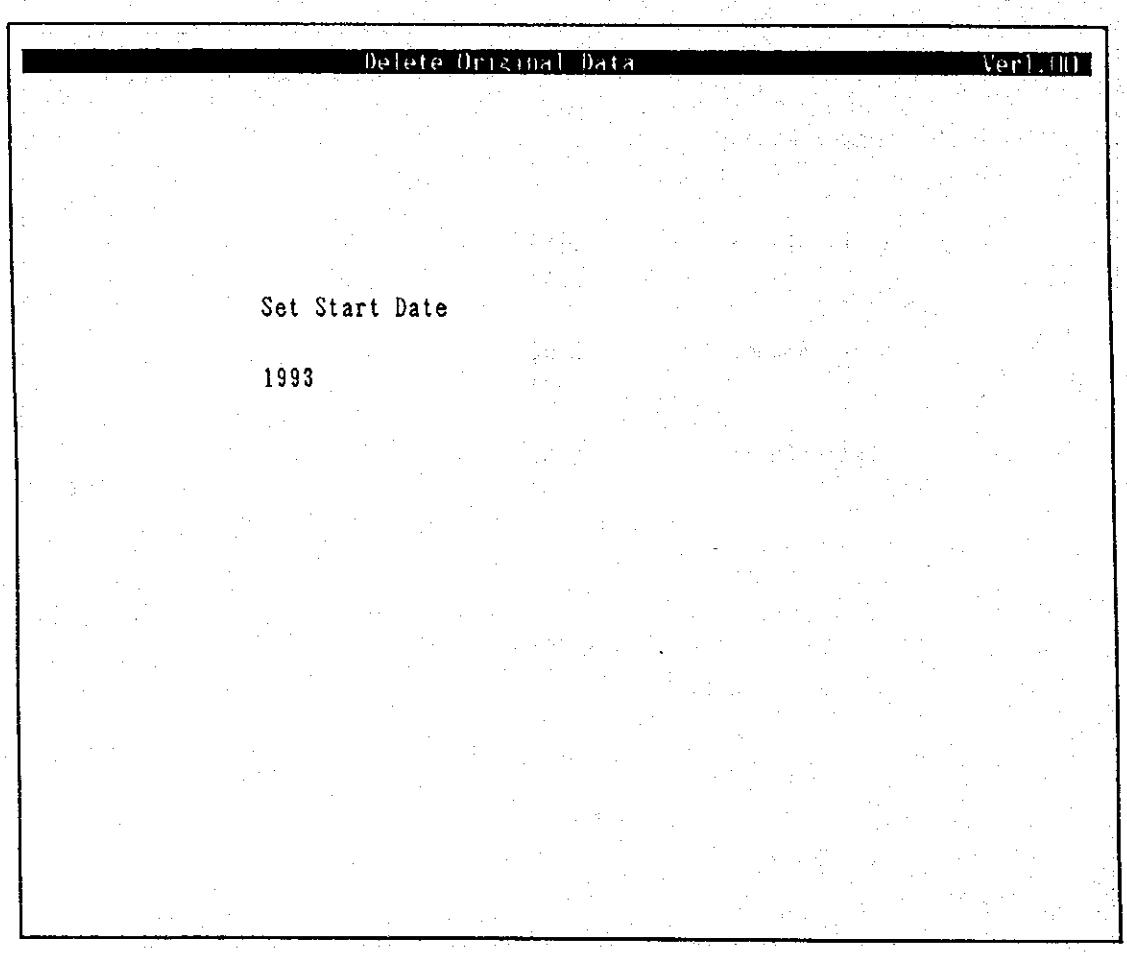


When selecting Copy Offset Data to Diskette, the Logger Selection screen will be displayed.
Begin copying by moving to the logger number whose offset data will be copied with "arrow keys", and press the RETURN key.
The screen will return to the Utility Menu by pressing the ESC key or the EXEC key.

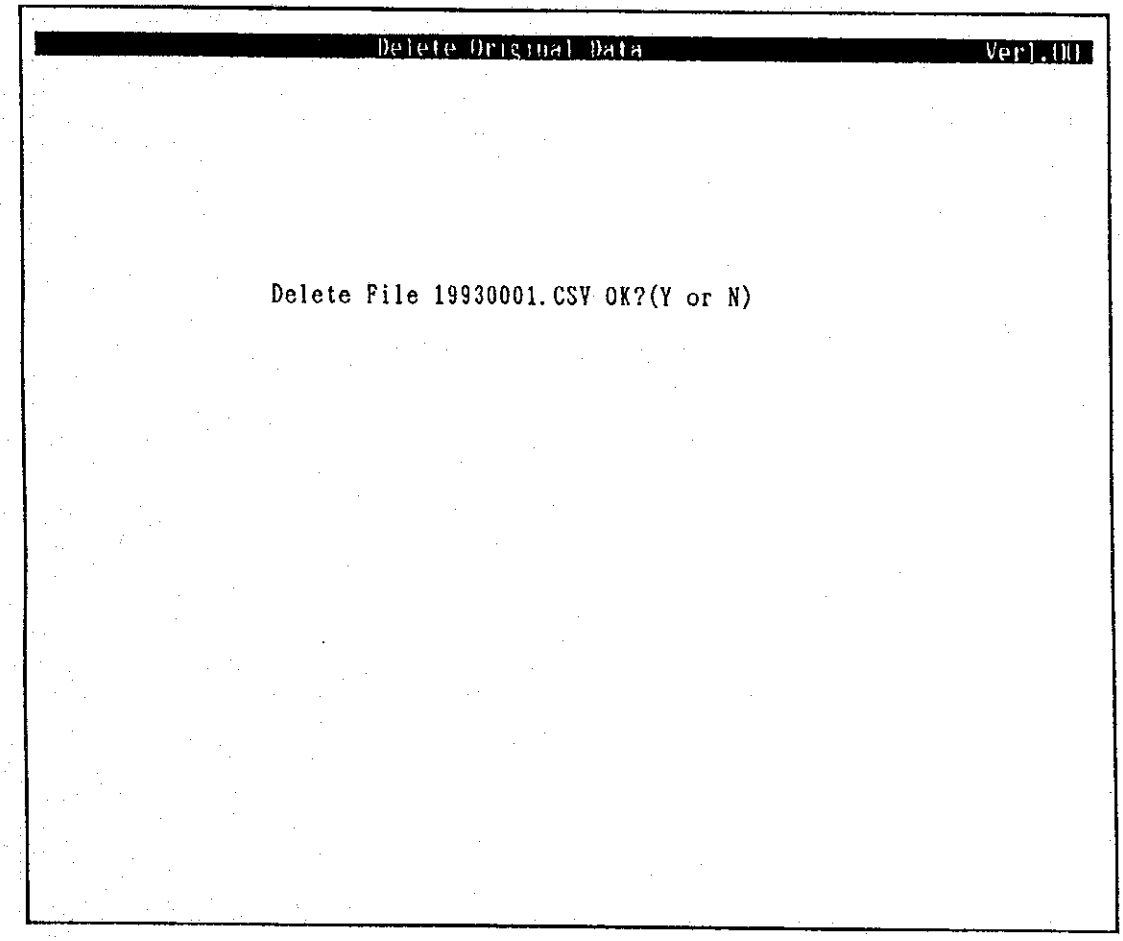
• Delete Original Data



When selecting Delete Original Data, the Logger Selection Screen will be Displayed.
Move to the logger number whose data will be deleted by using the "arrow key", and press the RETURN key.
The screen will return to the Utility Menu by pressing the ESC key or the EXEC key.

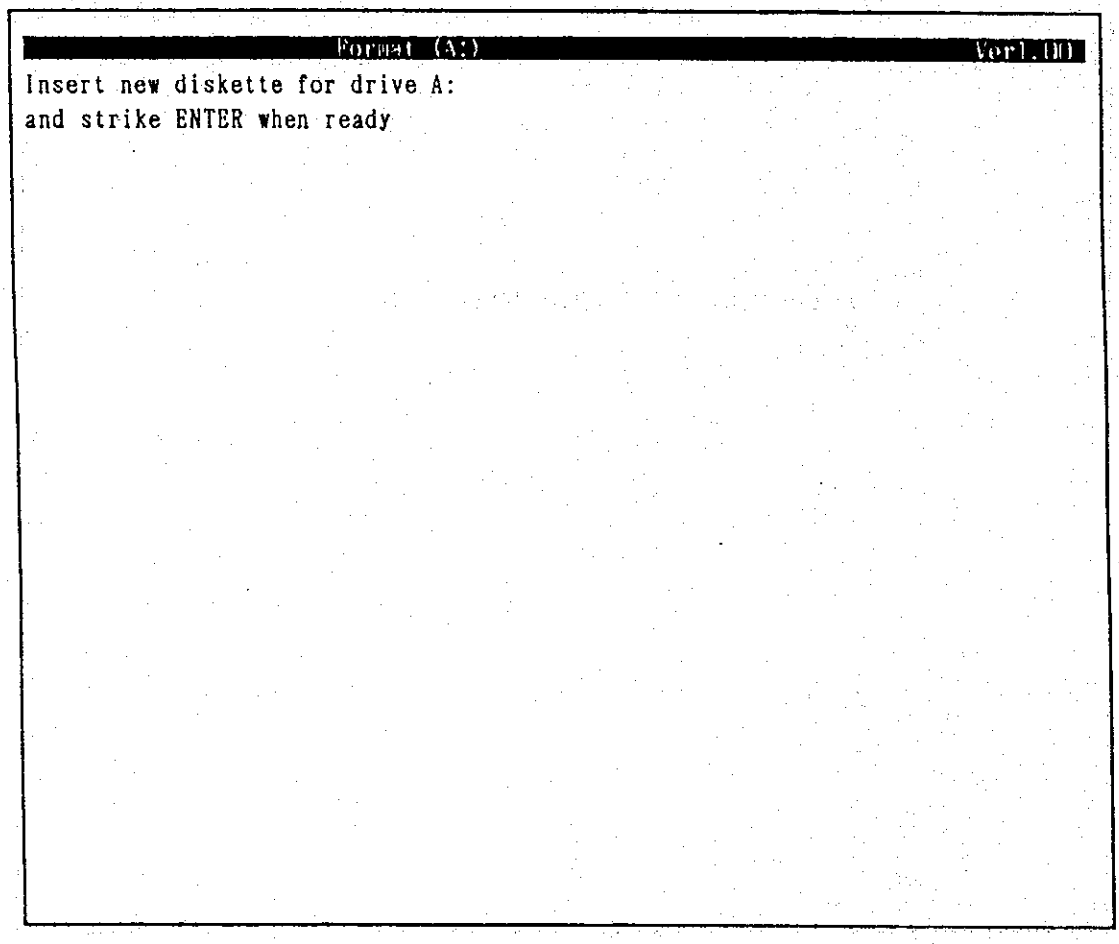


The message to confirm deletion is displayed and deletion is executed by entering Y, and the screen will return to the Utility Menu by entering N.
Delete only the unnecessary files because copy from FDD is not executed.



Enter the year next. Delete the data of the assigned year.
Enter the year in numbers, and press the RETURN key.
Moving is possible by using "arrow keys".
The screen will return to the Logger Selection Screen by pressing the ESC key.
The screen will return to the Utility Menu by pressing the EXEC key.

• Format



Format is started by pressing the RETURN key.
Format is suspended by pressing CTRL-C.

5.4 Other Equipment

Interrupted power supply

Protective Action (Alarm) of the Uninterrupted Electric Power Supply Unit

Items	Alarm Lamp	Buzzer	Action
Input H.V	Ⓡ	🔔	The alarm lamp and buzzer come on when the input voltage is beyond the specified value. The equipment does not stop.
Output H.V L.V	Ⓡ	🔔	Stop the equipment when the output voltage is beyond the specified range because of equipment failure.
Output O.C	Ⓡ	🔔	The alarm lamp and buzzer come on when the output voltage reaches 5A or greater and the equipment does not stop. When the output voltage reaches 6A or greater, the output voltage lowers (drops) only during an outage and stops the equipment with output L.V.
Temperature rise	Ⓡ	🔔	Stop the equipment when the temperature inside the equipment (cooling fin) goes beyond the specified value.
Recharger failure	Ⓡ	🔔	The alarm lamp and buzzer come on when the recharger fails and recharger output is beyond the specified value. The equipment does not stop.
Battery diskharge			During an power outage, stop the instrument when the battery voltage reaches the final diskharge voltage. The alarm lamp and buzzer do not come on in this case.

(Note) Ⓡ Flashes 🔔 Goes on

6.0 Test Record

MAR 22 1993

LAND SUBSIDENCE SENSOR TEST DATA

No. 1

ITEM No.	1	2	3	4	5
SHIFT (mm)	OUTPUT VOLT (V)	OUTPUT VOLT (V)	OUTPUT VOLT (V)	OUTPUT VOLT (V)	OUTPUT VOLT (V)
0.0	0.001	0.007	0.002	0.003	0.005
10.0	0.492	0.446	0.495	0.444	0.441
20.0	0.988	0.952	0.992	0.942	0.936
30.0	1.486	1.446	1.491	1.436	1.435
40.0	1.984	1.933	1.993	1.933	1.931
50.0	2.485	2.432	2.489	2.429	2.433
60.0	2.977	2.931	2.994	2.930	2.932
70.0	3.478	3.422	3.496	3.432	3.425
80.0	3.985	3.923	3.994	3.933	3.926
90.0	4.483	4.425	4.497	4.435	4.430
99.0	4.930	4.878	4.942	4.888	4.874
100.0	4.985	4.926	4.992	4.939	4.923

ITEM No.	6	7	8	10	11
SHIFT (mm)	OUTPUT VOLT (V)	OUTPUT VOLT (V)	OUTPUT VOLT (V)	OUTPUT VOLT (V)	OUTPUT VOLT (V)
0.0	0.004	0.004	0.002	0.003	0.003
10.0	0.463	0.435	0.491	0.455	0.479
20.0	0.961	0.936	0.982	0.953	0.979
30.0	1.456	1.441	1.490	1.449	1.480
40.0	1.956	1.941	1.978	1.943	1.982
50.0	2.453	2.444	2.480	2.440	2.479
60.0	2.949	2.942	2.993	2.940	2.978
70.0	3.450	3.442	3.486	3.442	3.478
80.0	3.950	3.940	3.990	3.943	3.975
90.0	4.452	4.434	4.481	4.446	4.474
99.0	4.904	4.880	4.935	4.899	4.918
100.0	4.952	4.929	4.977	4.949	4.961

MAR 22 1993

LAND SUBSIDENCE SENSOR TEST DATA

No. 2

ITEM No.	12	13	14	15	16
SHIFT (mm)	OUTPUT VOLT (V)	OUTPUT VOLT (V)	OUTPUT VOLT (V)	OUTPUT VOLT (V)	OUTPUT VOLT (V)
0.0	0.001	0.003	0.004	0.005	0.002
10.0	0.491	0.454	0.449	0.441	0.472
20.0	1.002	0.962	0.951	0.936	0.969
30.0	1.501	1.462	1.451	1.435	1.467
40.0	1.997	1.952	1.953	1.931	1.970
50.0	2.488	2.450	2.453	2.433	2.468
60.0	2.984	2.948	2.949	2.932	2.968
70.0	3.492	3.448	3.449	3.425	3.469
80.0	3.997	3.950	3.950	3.926	3.973
90.0	4.489	4.446	4.448	4.430	4.476
99.0	4.938	4.900	4.902	4.874	4.923
100.0	4.977	4.951	4.952	4.923	4.973

ITEM No.	17	18	19	20	21
SHIFT (mm)	OUTPUT VOLT (V)	OUTPUT VOLT (V)	OUTPUT VOLT (V)	OUTPUT VOLT (V)	OUTPUT VOLT (V)
0.0	0.002	0.004	0.005	0.002	0.002
10.0	0.473	0.447	0.450	0.499	0.484
20.0	0.994	0.948	0.949	1.002	0.977
30.0	1.497	1.448	1.448	1.502	1.471
40.0	1.996	1.946	1.949	2.000	1.970
50.0	2.492	2.448	2.449	2.504	2.473
60.0	2.992	2.943	2.949	3.004	2.975
70.0	3.497	3.447	3.447	3.504	3.481
80.0	3.994	3.951	3.949	4.004	3.977
90.0	4.497	4.451	4.448	4.497	4.483
99.0	4.945	4.898	4.901	4.938	4.938
100.0	4.994	4.944	4.950	4.978	4.987

MAR 12 1993

WATER LEVEL SENSOR TEST DATA

No. 1

ITEM No.	G333	G334	G335	G337	G338
PRESSURE (kgf／cm²)	OUTPUT VOLT (V)	OUTPUT VOLT (V)	OUTPUT VOLT (V)	OUTPUT VOLT (V)	OUTPUT VOLT (V)
0.00	0.008	0.009	0.009	0.010	0.010
0.20	0.501	0.502	0.500	0.500	0.504
0.40	1.002	1.006	1.005	1.005	1.007
0.60	1.498	1.503	1.500	1.504	1.503
0.80	1.994	2.003	2.000	1.999	2.001
1.00	2.449	2.506	2.502	2.505	2.508
1.20	3.000	2.996	2.998	2.997	3.000
1.40	3.503	3.499	3.497	3.500	3.499
1.60	3.998	3.994	3.994	3.996	3.998
1.80	4.495	4.492	4.495	4.500	4.498
2.00	5.002	4.998	5.001	5.002	5.001

ITEM No.	G339	G340	G341	G342	G343
PRESSURE (kgf／cm²)	OUTPUT VOLT (V)	OUTPUT VOLT (V)	OUTPUT VOLT (V)	OUTPUT VOLT (V)	OUTPUT VOLT (V)
0.00	0.009	0.008	0.009	0.010	0.009
0.20	0.501	0.501	0.498	0.502	0.502
0.40	1.006	1.001	1.006	1.005	1.006
0.60	1.501	1.500	1.501	1.500	1.502
0.80	1.997	1.999	2.001	1.997	1.998
1.00	2.506	2.505	2.504	2.506	2.503
1.20	2.996	2.995	3.001	2.997	2.996
1.40	3.496	3.498	3.500	3.501	3.501
1.60	3.998	3.993	3.999	3.995	3.995
1.80	4.499	4.495	4.501	4.497	4.496
2.00	5.003	5.000	5.007	5.000	5.000

MAR 12 1993

WATER LEVEL SENSOR TEST DATA

No. 2

ITEM No.	G344	G345	G346	G347	G348
PRESSURE (kgf／cm²)	OUTPUT VOLT (V)	OUTPUT VOLT (V)	OUTPUT VOLT (V)	OUTPUT VOLT (V)	OUTPUT VOLT (V)
0.00	0.008	0.009	0.008	0.010	0.009
0.20	0.503	0.497	0.502	0.502	0.500
0.40	1.005	0.996	1.006	1.006	1.004
0.60	1.500	1.496	1.506	1.502	1.502
0.80	1.997	1.992	2.002	1.998	1.999
1.00	2.505	2.501	2.507	2.504	2.506
1.20	2.997	2.996	3.001	2.997	2.999
1.40	3.498	3.498	3.503	3.499	3.500
1.60	3.996	3.998	3.996	3.997	3.996
1.80	4.497	4.497	4.501	4.496	4.499
2.00	5.000	5.000	5.006	5.001	5.003

ITEM No.	G349	G350	G351	G352	G353
PRESSURE (kgf／cm²)	OUTPUT VOLT (V)	OUTPUT VOLT (V)	OUTPUT VOLT (V)	OUTPUT VOLT (V)	OUTPUT VOLT (V)
0.00	0.008	0.010	0.009	0.009	0.008
0.20	0.504	0.500	0.500	0.501	0.499
0.40	1.005	1.005	1.000	1.002	1.003
0.60	1.501	1.501	1.499	1.499	1.496
0.80	2.001	2.003	1.998	2.000	2.000
1.00	2.507	2.508	2.503	2.504	2.504
1.20	3.000	3.005	2.998	2.997	2.999
1.40	3.504	3.504	3.501	3.501	3.501
1.60	3.999	4.003	3.998	3.997	3.999
1.80	4.501	4.501	4.493	4.500	4.498
2.00	5.005	5.010	5.002	5.002	5.006

MAR 5 1993

DATALOGGER TEST DATA

ITEM No.2044

CH	0	2	4	6	1	3	5	7
INPUT VOLT (V)	S.B. (mm)	S.B. (mm)	S.B. (mm)	S.B. (mm)	W.L. (m)	W.L. (m)	W.L. (m)	W.L. (m)
0.0	0	0	0	0	0	0	0	0
1.0	20.0	20.0	20.0	19.9	4.0	4.0	4.0	4.0
2.0	40.0	40.0	40.0	39.9	8.0	8.01	8.0	8.0
3.0	60.0	60.0	59.9	59.9	11.99	11.99	12.0	12.0
4.0	80.0	80.0	79.9	79.9	16.0	16.0	15.99	16.0
4.9	97.7	98.0	79.9	97.7	19.55	19.53	19.57	19.55

ITEM No.2045

CH	0	2	4	6	1	3	5	7
INPUT VOLT (V)	S.B. (mm)	S.B. (mm)	S.B. (mm)	S.B. (mm)	W.L. (m)	W.L. (m)	W.L. (m)	W.L. (m)
0.0	0	0	0	0	0	0	0	0
1.0	19.9	20.0	19.9	19.9	4.0	4.0	4.0	4.0
2.0	40.0	40.0	40.0	39.9	8.01	8.01	8.01	8.01
3.0	60.0	60.0	59.9	59.9	12.0	11.99	11.99	11.99
4.0	80.0	80.0	79.9	80.0	16.0	16.0	16.0	15.99
4.9	97.4	97.8	97.8	97.8	19.42	19.6	19.51	19.56

ITEM No.2046

CH	0	2	4		1	3	5	
INPUT VOLT (V)	S.B. (mm)	S.B. (mm)	S.B. (mm)		W.L. (m)	W.L. (m)	W.L (m)	
0.0	0	0	0		0	0	0	
1.0	19.9	19.9	19.9		4.0	3.99	3.99	
2.0	40.0	40.0	40.0		8.01	8.0	8.0	
3.0	59.9	59.9	59.9		12.0	11.99	12.0	
4.0	79.9	79.9	79.9		15.99	16.0	16.0	
4.9	97.9	97.9	97.7		19.6	19.6	19.6	

註) S.B.はSUBSIDENCE, W.L.はWATER LEVELです。

MAR 5 1993

DATALOGGER TEST DATE

ITEM No.2048

CH	0	2			1	3		
INPUT VOLT (V)	S.B. (mm)	S.B. (mm)			W.L. (m)	W.L. (m)		
0.0	0	0			0	0		
1.0	20.0	20.0			3.99	4.0		
2.0	40.0	40.0			8.0	8.0		
3.0	59.9	59.9			11.99	12.0		
4.0	80.0	80.0			16.0	16.0		
4.9	98.0	98.0			19.0	19.0		

ITEM No.2043

CH	0	2	4		1	3	5	
INPUT VOLT (V)	S.B. (mm)	S.B. (mm)	S.B. (mm)		W.L. (m)	W.L. (m)	W.L. (m)	
0.0	0	0	0		0	0	0	
1.0	20.0	20.0	20.0		4.0	4.0	3.99	
2.0	40.0	40.0	40.0		8.01	8.01	8.01	
3.0	59.9	60.0	60.0		12.01	12.01	12.0	
4.0	79.9	79.9	80.0		15.99	15.99	16.0	
4.9	97.8	97.9	97.5		19.56	19.6	19.6	

ITEM No.2049

CH	0	2			1	3		
INPUT VOLT (V)	S.B. (mm)	S.B. (mm)			W.L. (m)	W.L. (m)		
0.0	0	0			0	0		
1.0	19.9	19.9			4.0	3.99		
2.0	40.0	40.0			8.0	8.0		
3.0	59.9	60.0			11.99	12.0		
4.0	80.0	80.0			16.0	16.0		
4.9	98.0	98.0			19.6	19.61		

註) S.B.はSUBSIDENCE, W.L.はWATER LEVELです。