

Chapter 10

Data Communications

This chapter tells you everything you need to know to transfer programs between two CASIO Power Graphic calculators connected using the cable that is equipped as a standard accessory.

You can also use the cable to connect the calculator to a CASIO Label Printer to print screen data.

To transfer data between a calculator and a personal computer, you need to purchase the separately available CASIO FA-123 Connection Kit.

- 10-1 Connecting Two Units**
- 10-2 Connecting the Unit with a CASIO Label Printer**
- 10-3 Connecting the Unit to a Personal Computer**
- 10-4 Performing a Data Communication Operation**
- 10-5 Data Communications Precautions**
- 10-6 Sending a Screen Shot**
- 10-7 Add-ins**
- 10-8 MEMORY Mode**

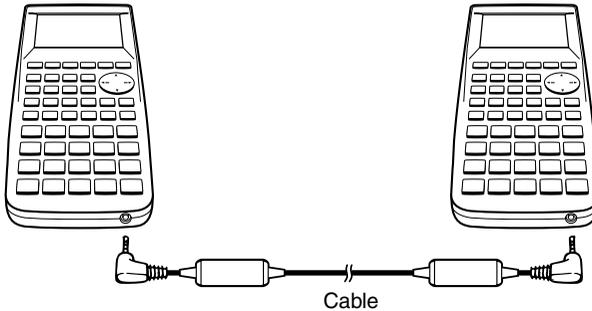
10

10-1 Connecting Two Units

The following procedure describes how to connect two units with the connecting cable that comes equipped as a standard accessory.

• To connect two units

1. Check to make sure that the power of both units is off.
2. Remove the covers from the connectors of the two units.
3. Connect the two units using the cable.



Models that are supported for this configuration are shown below.

ALGEBRA FX 2.0/FX 2.0 PLUS
FX 1.0/FX 1.0 PLUS

Be sure you keep the connector covers in a safe place so you can replace them after you finish your data communications.

Keep the connectors covered when you are not using them.

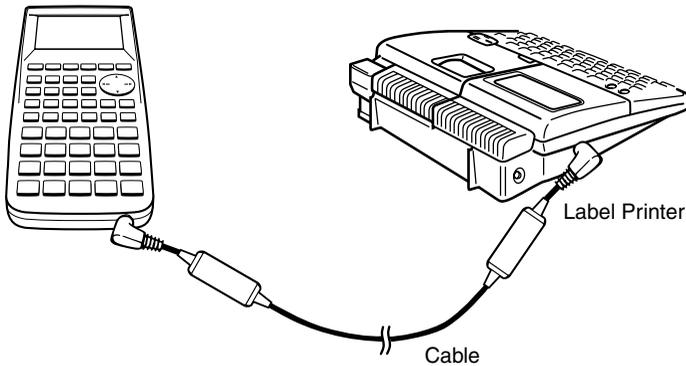
10-2 Connecting the Unit with a CASIO Label Printer

After you connect the unit to a CASIO Label Printer with cable, you can use the Label Printer to print screen shot data from the unit (see 10-6 Sending a Screen Shot). See the user's guide that comes with your Label Printer for details on how to perform this operation.

- The operation described above can be performed using the following Label Printer models: KL-2000, KL-2700, KL-8200, KL-8700 (as of February 1999).

•To connect the unit to a Label Printer

1. Check to make sure that the power of the unit and the Label Printer is off.
2. Connect the cable to the Label Printer.
3. Remove the cover from the connector of the unit.
4. Connect the other end of the cable to the unit.
5. Turn on the power of the unit, followed by the Label Printer.



- After you finish data communications, turn off power in the sequence: the unit first, and then the Label Printer. Finally, disconnect the equipment.



Be sure you keep the connector cover in a safe place so you can replace it after you

finish your data communications.

10-3 Connecting the Unit to a Personal Computer

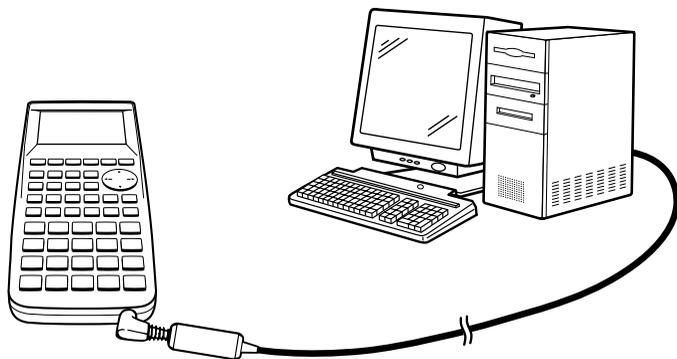
To transfer data and screen shots between the unit and a personal computer, you must connect them through a separately available CASIO FA-123 Connection Kit.

For details on operation, the types of computer that can be connected, and hardware limitations, see the user's manual that comes with the FA-123.

Some types of data may not be able to be exchanged with a personal computer.

• To connect the unit to a personal computer

1. Check to make sure that the power of the unit and the personal computer is off.
2. Connect the personal computer to the FA-123 Connection Kit.
3. Remove the cover from the connector of the unit.
4. Connect the unit to the FA-123 Connection Kit.
5. Turn on the power of the unit, followed by the personal computer.



- After you finish data communications, turn off power in the sequence: the unit first, and then the personal computer. Finally, disconnect the equipment.



The ALGEBRA calculator also supports to PC transfer of programs created with a CASIO CFX-9850 Series calculator.

Be sure you keep the connector cover in a safe place so you can replace it after you finish your data communications.

10-4 Performing a Data Communication Operation

From the Main Menu, enter the LINK Mode. The following data communication main menu appears on the display.

```
Data Communication

F1:Transmit
F2:Receive
TRNS|RCV|
```

- {TRNS}/ {Recv} ... menu of {send settings}/ {receive settings}

Communication parameters are fixed at the following settings.

- Speed (BPS): 38.4 kbps (sending a data)
9,600bps (sending a screen shot)
- Parity (PARITY): NONE

■ Performing a Data Transfer Operation

Connect the two units and then perform the following procedures.

Receiving unit

To set up the calculator to receive data, press **F2** (Recv) while the data communication main menu is displayed.

```
Receivins...

Cancel:[AC]
```

The calculator enters a data receive standby mode and waits for data to arrive. Actual data receive starts as soon as data is sent from the sending unit.

Sending unit

To set up the calculator to send data, press **[F1]** (TRNS) while the data communication main menu is displayed.

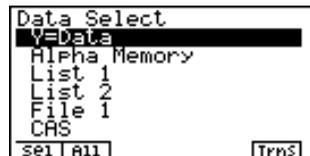


Press the number key that corresponds to the type of data you want to send.

- **{Select}** ... {selects data items and sends them}
- **{Currrnt}** ... {selects data items from among previously selected data items and sends them}
- **{Backup}** ... {sends all memory contents, including mode settings}
- **{H-Copy}** ... {selects H-Copy screen shot data and sends it}

• To send selected data items

Press **[1]** (Select) or **[2]** (Currrt) to display a data item selection screen.



- **{Sel}** ... {selects data item where cursor is located}
- **{All}** ... {selects all data}
- **{Trns}** ... {sends selected data items}

Use the **▲** and **▼** cursor keys to move the cursor to the data item you want to select and press **[F1]** (Sel) to select it. Currently selected data items are marked with “▶”. Pressing **[F6]** (Trns) sends all the selected data items.

- To deselect a data item, move the cursor to it and press **[F1]** (Sel) again.

Only items that contain data appear on the data item selection screen. If there are too many data items to fit on a single screen, the list scrolls when you move the cursor to the bottom line of the items on the screen.

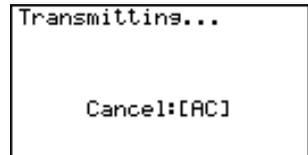
•To execute a send operation

After selecting the data items to send, press **[F6]** (Trns). A message appears to confirm that you want to execute the send operation.



- **[EXE]** (Yes) ... sends data
- **[ESC]** (No) ... returns to data selection screen

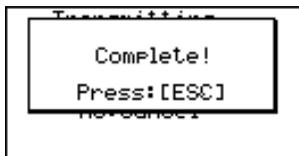
Press **[EXE]** (Yes) to send the data.



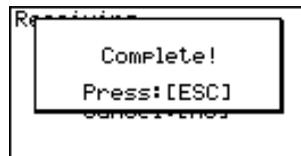
- You can interrupt a data operation at any time by pressing **[AC]**.

The following shows what the displays of the sending and receiving units look like after the data communication operation is complete.

Sending Unit



Receiving Unit



Press **[ESC]** to return to the data communication main menu.



• To send backup data

This operation allows you to send all memory contents, including mode settings.

While the transmit data type selection menu is on the screen, press **[3]** (Backup), to display the screen shown below.



Press **[EXE]** (Yes) to start the send operation.

The following shows what the displays of the sending and receiving units look like after the data communication operation is complete.

Sending Unit



Receiving Unit



Press **[ESC]** to return to the data communication main menu.



Data can become corrupted, necessitating a RESET of the receiving unit, should the connecting cable become disconnected during data transfer.

Make sure that the cable is securely connected to both units before performing any data communication operation.

10-5 Data Communications Precautions

The following are the types of data items that can be sent.

Data Item	Contents	Overwrite Check* ¹	Password Check* ²
Program names	Program contents (All programs are listed.)	Yes	Yes
Mat n	Matrix memory (A to Z) contents	Yes	
List n	List memory (1 to 20) contents	Yes	
File n	List file memory (1 to 6) contents	Yes	
Y=Data	Graph expressions, graph write/ non-write status, V-Window contents, zoom factors	No	
G-Mem n	Graph memory (1 to 20) contents	Yes	
V-Win n	V-Window memory contents	No	
Picture n	Picture (graph) memory (1 to 20) data	No	
DynaMem	Dynamic Graph functions	Yes	
Equation	Equation calculation coefficient values	No	
Alpha Memory	Variable memory contents	No	
F-Mem n	Function memory contents	No	
CAS	CAS formula data contents (ALGEBRA FX 2.0 PLUS only)	No	
Algebra	Algebra data contents (ALGEBRA FX 2.0 PLUS only)	No	
DIFF Equation	Differential Equation data	No	
E-CON Data	E-CON data	No	
Add-in application names	Add-in application data (All add-in applications are listed.)	No	

*1 No overwrite check: If the receiving unit already contains the same type of data, the existing data is overwritten with the new data.

With overwrite check: If the receiving unit already contains the same type of data, a message appears to ask if the existing data should be overwritten with the new data.

Data item name —

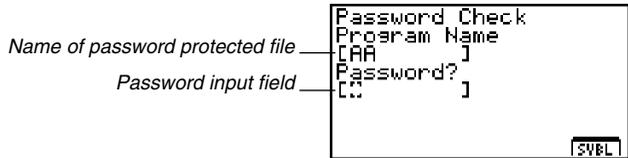
```

Overwrite Check
[Mat A ]
Already Exists
Overwrite OK?
F1: Yes
F6 :No
ESC:Cancel
YES | NO |

```

- **[F1]** (YES) ... {replaces the receiving unit's existing data with the new data}
- **[F6]** (NO) ... {skips to next data item}

*2 With password check: If a file is password protected, a message appears asking for input of the password.



After inputting the password, press **[EXE]**.

Note the following precautions whenever you perform data communications.

- An error occurs whenever you try to send data to a receiving unit that is not yet standing by to receive data. When this happens, press **[ESC]** to clear the error and try again, after setting up the receiving unit to receive data.
- An error occurs whenever the receiving unit does not receive any data approximately six minutes after it is set up to receive data. When this happens, press **[ESC]** to clear the error.
- An error occurs during data communications if the cable becomes disconnected, if the parameters of the two units do not match, or if any other communications problem occurs. When this happens, press **[ESC]** to clear the error, then correct the problem before trying data communications again. If data communications are interrupted by the **[ESC]** key operation or an error, any data successfully received up to the interruption will be in the memory of the receiving unit.
- An error occurs if the receiving unit memory becomes full during data communications. When this happens, press **[ESC]** to clear the error and delete unneeded data from the receiving unit to make room for the new data, and then try again.
- The E-CON item contains the following data.
 1. Current Setup Data
 2. Setup Memory Data
 3. Custom Probe Memory Data

The corresponding data is overwritten on the receiver. Setup Memory data and Custom Probe Memory data overwrites the data for the same memory number on the receiver. If you want to keep data from being overwritten on the receiver, change its memory number.

10-6 Sending a Screen Shot

Use the following procedures to send a hardcopy of the screen directly to a connected personal computer (or CASIO Label Printer) or to save a screen shot in memory to send later. Screen shots can also be sent to a CASIO Label Printer.

Use the LINK Mode set up (**CTRL** **F3**(SET UP)) to specify whether you want to send the screen shot now or save it in memory.

• H-Copy

- {Dirct}/{Mem} {direct send}/{save}

• To send a screen shot directly to a connected computer (or CASIO Label Printer) (Direct)

1. Connect the unit to the computer (or CASIO Label Printer).

On the computer (or CASIO Label Printer), perform the procedures required to set it up to receive data.

2. Display the screen you want to send.

3. Press **CTRL** **F6** (H-COPY).

• To save a screen shot in memory (Memory)

1. Display the screen you want to save.

2. Press **CTRL** **F6** (H-COPY).

- You can store up to 20 screen shots in memory. Saved screen shots are automatically assigned file names from Hcopy1 to Hcopy20.



You cannot send the following types of screens to a computer or a Label Printer.

- The screen that appears while a data communication operation is in progress.
- A screen that appears while a calculation is in progress.
- The screen that appears following the reset operation.
- The low battery message.

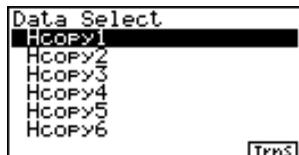
The flashing cursor is not included in the screen image that is sent from the unit.

- # You cannot use 6mm wide tape to print a screen shot of a graph.

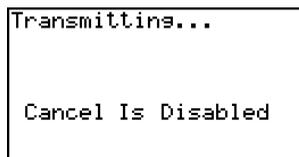


● **To send a saved screen shot to a computer or CASIO Label Printer**

1. Connect the unit to the computer (or CASIO Label Printer). On the computer (or CASIO Label Printer), perform the procedures required to set it up to receive data.
2. In the LINK Mode, press **[F1]**(TRNS) **[4]** (H-Copy) to display the list of screen shots in memory.



3. Use the **▲** and **▼** cursor keys to highlight the name of the screen shot you want to send, and then press **[F6]**(Trns).



10-7 Add-ins

Add-in capabilities let you install separately available applications and other software to tailor the calculator to suit your particular needs.

Add-ins are installed from a computer using the data communication described on page 10-4-1.

The following are the types of software that can be installed as add-ins.

- **Add-in Application**

After you install an application, its icon appears in the Main Menu, and you can run it just as you would a built-in application.

- **Built-in Application Upgrades**

These are upgrades for the applications that are pre-programmed in the calculator's ROM.

- **On-screen Message Language Data**

This data is required to display on-screen messages in other languages. Installing this data causes all on-screen messages to appear in the corresponding language.



10-8 MEMORY Mode

This calculator has two separate memory areas: a “current area” and a “storage area.” The current area is a work area where you can perform input data, perform calculations and run programs. Data in the current area is relatively safe, but it can be deleted when batteries go dead or when you perform a full reset.

The storage area uses “flash memory,” so data is safe even when power is interrupted. Normally, you would use the storage area for data you need to store securely for long periods and load it into the current area only when you need it.

Use the MEMORY Mode to transfer data between the current area and storage area, and to perform other memory management operations.

From the Main Menu, select the **MEMORY** icon to enter the MEMORY Mode and display its initial screen.



- {**PROG**} {program file save, load, delete, search}
- {**BACK**} {current area data backup and restore}
- {**OPT**} {optimization of the storage area}

■ Storing and Loading Program Files

Use the following procedures to store a current area program file into the storage area, and to load a file from the storage area into the current area.



• **To store a program file into the storage area**

1. On the initial MEMORY Mode screen press **[F1]** (PROG).

- This displays a list of program files that are in the current area.*1

```

Current Area
-----
[AAA] : 56
[SAMPLE] : 37
[TEST] : 54

146765 BytesFree
SEL | DEL | DELA | SRC | SAVE | STRG
    
```

2. Select the program file you want to store.

- Use the cursor **[▲]** and **[▼]** keys to highlight the name of the program file you want to store, and then press **[F1]** (SEL).

3. Press **[F5]** (SAVE).

The message “Complete!” appears when the store operation is finished.

Press **[ESC]** to return to the screen displayed in step 1.

A “Memory ERROR” occurs and the store operation is terminated if the storage area becomes full.

The following message appears if there is already a program file in the storage area with the same name as the program file you are trying to save.

```

Current Area
-----
[SAMPLE]
[X] Already Exists
Overwrite OK?
Yes: [EXE]
No : [ESC]
    
```

Press **[EXE]** (Yes) to save the new program file, or **[ESC]** (No) to cancel the save operation.



*1 This screen appears as shown to the right if there are no program files in the current area when you start the save operation.

```

Current Area
-----
No Programs
    
```

• **To load a program file from the storage area**

1. On the initial MEMORY Mode screen press **[F1]** (PROG).
2. Press **[F6]** (STRG).
 - This displays a list of program files that are in the storage area. *1
3. Select the program file you want to load.
 - Use the cursor **▲** and **▼** keys to highlight the name of the program file you want to load, and then press **[F1]** (SEL).
4. Press **[F5]** (LOAD).

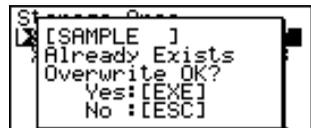


The message “Complete!” appears when the load operation is finished.

Press **[ESC]** to return to the screen displayed in step 1.

A “Memory ERROR” occurs and the load operation is terminated if the current area becomes full.

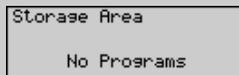
The following message appears if there is already a program file in the current area with the same name as the program file you are trying to load.



Press **[EXE]** (Yes) to load the new program file, or **[ESC]** (No) to cancel the load operation.



*1 The screen appears as shown below if there are no program files in the storage area when you start the load operation.

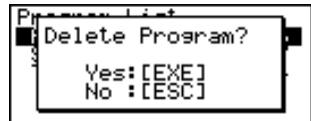


■ Deleting Program Files

Use the following procedures to delete individual files or all files in the current area or storage areas.

● To delete a current area program file

1. On the initial MEMORY Mode screen press **[F1]** (PROG).
 - This displays a list of program files that are in the current area.
2. Use the cursor **▲** and **▼** keys to highlight the name of the program file you want to delete, and then press **[F2]** (DEL).



- Press **[EXE]** (Yes) to delete the program file.
- Press **[ESC]** (No) to cancel the delete operation.

● To delete a storage area program file

1. On the initial MEMORY Mode screen press **[F1]** (PROG).
2. Press **[F6]** (STRG).
 - This displays a list of program files that are in the storage area.
3. Use the cursor **▲** and **▼** keys to highlight the name of the program file you want to delete, and then press **[F2]** (DEL).
 - Press **[EXE]** (Yes) to delete the program file.
 - Press **[ESC]** (No) to cancel the delete operation.

● To delete all the program files in the current area

1. On the initial MEMORY Mode screen press **[F1]** (PROG).
 - This displays a list of program files that are in the current area.
2. Press **[F3]** (DEL·A).



- Press **[EXE]** (Yes) to delete all the program files in the current area.
- Press **[ESC]** (No) to cancel the delete operation.

• To delete all the program files in the storage area

1. On the initial MEMORY Mode screen press **[F1]** (PROG).
2. Press **[F6]** (STRG).
 - This displays a list of program files that are in the storage area.
3. Press **[F3]** (DEL•A).
 - Press **[EXE]** (Yes) to delete all the program files in the storage area.
 - Press **[ESC]** (No) to cancel the delete operation.

■ Searching for a Program File

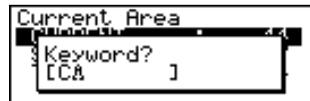
Use the following procedures to search for a specific program file in the current area or in the storage area.

• To search for a program file in the current area *1

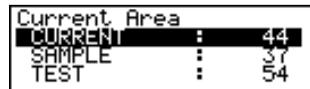


Example To search for all program files in the current area whose names begin with the letter “C”

1. On the initial MEMORY Mode screen press **[F1]** (PROG).
 - This displays a list of program files that are in the current area.
2. Press **[F4]** (SRC).
 - Input the letter “C” for the keyword.



- The first program file name that begins with the letter “C” appears highlighted on display.



*1 You can input up to eight characters for the keyword.

The message “Not Found” appears if there are no program file names that match your keyword.

• **To search for a program file in the storage area**



Example To search for all program files in the storage area whose names begin with the letter “S”

1. On the initial MEMORY Mode screen press **[F1]** (PROG).
 2. Press **[F6]** (STRG).
 - This displays a list of program files that are in the storage area.
 3. Press **[F4]** (SRC).
 - Input the letter “S” for the keyword.
- The first program file name that begins with the letter “S” appears highlighted on display.

Storage Area		
SAMPLE	:	37
STORAGE	:	44
TEST	:	54

Press **[▼]** or **[F1]** (SRC) to highlight the next file name that matches your keyword.

Press **[▲]** to highlight the previous file name that matches your keyword.

The message “Not Found” appears if there are no program file names that match your keyword.

Press **[ESC]** to exit the search.



■ Backing Up Current Area Data

You can back up all the data in the current area and store it in the storage area. Later you can restore the backed up data to the current area when necessary.

● To back up current area data

1. On the initial MEMORY Mode screen press **[F2]** (BACK).
 - Screen A appears if there is already backup data in the storage area. Screen B appears if there is no backup data in the storage area.

Screen A

```
Backup
Backup Data Exists
  In Storage Area
SAVE|LOAD|DEL
```

Screen B

```
Backup
No Backup Data
  In Storage Area
SAVE
```

2. Press **[F1]** (SAVE) to backup the data.

The message "Complete!" appears when the backup operation is finished.

Press **[ESC]** to return to the screen displayed in step 1.

The following message appears if there is already backup data in the storage area.

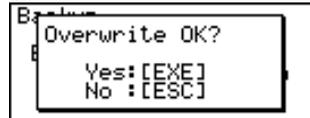
```
Backup
Overwrite OK?
Yes: [EXE]
No : [ESC]
```

Press **[EXE]** (Yes) to back up the data, or **[ESC]** (No) to cancel the backup operation.

A "Memory ERROR" occurs when there is not enough space available in the storage area to complete the backup operation.

• **To restore backup data to the current area**

1. On the initial MEMORY Mode screen press **[F2]** (BACK).
 - On the screen that appears, you can confirm whether or not there is backup data in the storage area.
2. Press **[F2]** (LOAD).
 - A message appears to confirm whether or not you really want to restore the backed up data.



Press **[EXE]** (Yes) to restore the data and delete any data currently in the area.

Press **[ESC]** (No) to cancel the data backup operation.

The message "Complete!" appears when the restore operation is finished.

Press **[ESC]** to return to the screen displayed in step 1.

• **To delete backup data from the storage area**

1. On the initial MEMORY Mode screen press **[F2]** (BACK).
 - On the screen that appears, you can confirm whether or not there is backup data in the storage area.
2. Press **[F3]** (DEL).
 - A message appears to confirm whether or not you really want to delete the backed up data.



Press **[EXE]** (Yes) to delete the backed up data from the storage area.

Press **[ESC]** (No) to cancel the backup data delete operation.

The message "Complete!" appears when the delete operation is complete.

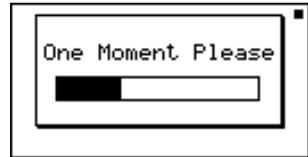
Press **[ESC]** to return to the screen displayed in step 1, which now contains the message "No Backup Data."

■ Optimizing the Storage Area

Storage area memory can become fragmented after many store and load operations. Fragmentation can cause blocks of memory to become unavailable for data storage. Because of this, you should periodically perform the storage area optimization procedure, which rearranges the data in the storage area and makes memory usage more economical.

• To optimize the storage area

On the initial MEMORY Mode screen press **[F3]** (OPT) to start storage area optimization.



The message "Complete!" appears when the optimize operation is complete.

Press **[ESC]** to return to the initial MEMORY Mode screen.

