Video Display Connection

There are three different methods of attaching a video display to the C4P computers. These are outlined as follows:

1. Preferred method - connect the supplied computer video cable to the high impedance (Hi-Z) input of a closed-circuit TV video monitor. Ohio Scientific offers a color television set, modified for video monitoring. Ohio Scientific also offers the Model AC-3 12" black and white monitor. Both are ideal for this application. The units double as a television when the video cable is disconnected.

2. Connect the supplied computer video cable to an "RF modulator" which is, in turn, connected to a standard television's antenna terminals. RF Modulators are inexpensive and allow you to use almost any television with your computer. They are sold in kit form.

3. Have a standard AC transformer-operated television modified to accept direct video entry. This requires special safety precautions which will be explained later.

Closed-Circuit Video Monitor Connection

1. Refer to Figure 1. Attach the supplied video cable to the computer as shown.

2. Connect the other end of the cable to the high impedance input of the video monitor. The AC-3 monitor has a Hi-Z RCA-type phono jack input. On other monitors, a high impedance - low impedance selector switch is sometimes present, or there may be two or more inputs. Consult the manufacturer's instructions.

3. Observe the manufacturer's power recommendations. If the monitor has a 3-wire grounded plug, connect it to a properly grounded 3-wire AC outlet.

4. Turn on the computer and monitor.

5. Allow the monitor to warm-up. You should see the screen filled with random graphics characters, alphabet, etc.

6. If necessary, adjust the VERTICAL and HORIZONTAL controls to obtain a stable picture.

RF Modulator/Standard TV Connection

1. Refer to Figure 1. Review the manufacturer's instructions included with the RF modulator.

2. Connect the computer video cable to the computer as shown.

3. Connect the video cable to the RF Modulator.

4. Connect the modulator to the television's antenna terminals (consult modulator instructions).

5. Plug in the television and computer.

6. Turn on the computer, television, and modulator (consult modulator instructions).

7. At this point you will have to select the proper TV channel and possibly adjust the television's fine tuning slightly (consult modulator instructions).

8. When the television warms up you should observe a screen filled with random graphics characters. If the picture is not stable, adjust the television's VERTICAL or HORIZONTAL controls as needed.

Modification of a Television For Direct Video Entry

1. A standard television may be modified to act as a video monitor. However, this conversion requires detailed knowledge of television circuitry, and will likely require a schematic of the television to be converted. Consult a qualified service person.

WARNING

ANY TELEVISION CONVERSIONS MUST BE PERFORMED ONLY BY A QUALIFIED PERSON, SUCH AS A TV SERVICEMAN. LETHAL VOLTAGES ARE PRESENT WITHIN THE TELEVISION. INCORRECT CONNECTIONS MAY PRESENT SHOCK HAZARDS OR DAMAGE THE COMPUTER. SUCH DAMAGE IS NOT COVERED BY THE WARRANTY.

2. The television to be modified must be an AC-transformer operated television. Several solid-state TV sets are now available which can be operated from 11ØV AC, or from a 12 volt source such as a car cigarette lighter. These televisions can usually be converted easily. Some older "AC-DC" tube-type televisions are "hot chassis" types; that is, one side of the power line is connected to the chassis. These televisions do not have transformers and MUST NOT be used for conversions.

HOW TO USE SCX-102 and SCX-104 SAMPLER TAPES

Please Read All Instructions Before Attempting To Use These Tapes

SCX-102 and SCX-104 each contain six individual programs selected from the OSI software library to serve as an introduction to cassette based computer operation. The contents of the samplers are as follows:

Side I:
1) Basic Math (4K)
2) Checking Account (4K)
3) Trig Tutor (8K)
4) Star Wars (4K)

Side II:
5) Counter (8K)
6) Presidents Quiz (8K)

(A brief description of these programs is included elsewhere.)

The figure following the above titles indicates the memory (RAM) requirement of the program. These programs are separated by approximately 10 seconds on the cassette.

FOLLOW THESE STEPS CAREFULLY!

1) Refer to the owner's manual to check the connections between the computer, video monitor (TV), and cassette recorder. The cassette recorder should be plugged into an AC outlet, not run on batteries.

2) Turn on: The computer, video monitor, and cassette recorder (if it has a switch).

3) Place the tape in the cassette recorder with Side I up. Rewind the tape until the leader is visible. DO NOT play the tape yet. Check the volume and tone controls of the cassette recorder - they should be set at mid-range.

4) Press <BREAK> — The screen should read "D/C/W/M?".

5) Type C — The computer will respond "MEMORY SIZE?".

6) Press <RETURN> — The computer will respond "TERMINAL WIDTH?".

7) Press <RETURN> — The computer should respond "OK". The computer will now respond to commands in BASIC.

8) Type LOAD — DO NOT press <RETURN> yet.

9) Now turn the tape recorder on to play the tape. When the tape (dark brown) begins to wind onto the right-hand spool, press <RETURN>.

   Momentarily, the program will begin listing on the screen. Programs requiring 4K RAM will load in approximately 3 minutes; 8K programs will take approximately 5 minutes.

10) You will know when the entire program is loaded by watching the screen. When the bottom lines on the screen read "?S ↵ ERROR" and "OK", the program is in the CIP. Now stop the tape. If you want the next program, do not rewind the tape.

11) Press <SPACE> <RETURN>.

12) To inspect the program, type LIST <RETURN>.

13) To execute the program, type RUN <RETURN>.

When you are done with the first program and are ready to enter the second program, follow these steps:

First, remember that the programs are separated by approximately 10 seconds of blank tape. If you did not rewind the tape after loading program one, you are ready to load program two.

Repeat Steps 4-8. This will remove the old program and reset the computer.

Turn the tape recorder on and press <RETURN> .

Repeat Steps 10-13.

To use the rest of the programs on SCX-102 or SCX-104, repeat this process.

When you turn the cassette over to Side II and begin to load program five, there will be a 20-30 second delay before the program begins to list on the screen.

If your cassette recorder has a counter, it is recommended that you reset the counter at the beginning of the tape and make a note of the start of each new program.

A brief description of the programs making up the sampler tapes follows.

Side I: Basic Math is an educational quiz program that gives addition, subtraction, multiplication, and division problems.

Checking Account will help you balance your checkbook. Just give the computer the initial balance and check amounts and let the computer do the work.

Trig Tutor explains and diagrams three trig functions: sine, cosine, tangent. The computer then tests your comprehension of these functions with a quiz.

Star Wars is an arcade-type computer game. You move the cross-hairs around the screen trying to draw a bead on the target ship.

Side II: Counter is a combination of educational game and cartoon for youngsters learning to count from one to ten.

Presidents Quiz asks you 20 historical questions about various presidents.

9899, 9900 and 9901, respectively. For example, the lowest address that can be used for a disk directory is 3584. This is disk page address 14,0,0 (low, mid, high) and would be entered this way:

```
POKE 9899,14 : POKE 9900,0 : POKE 9901,0
```

Note that since the usual disk page address of the directory is 98,0,0 (25088/256), the second and third bytes are already zero so the corresponding POKEs can be omitted.

4.) Run the CREATE program in RAM by typing only:

```
RUN
```

5.) Proceed to create a directory file on the new disk with the following characteristics:

Filename: "DIREC*"

Length: Specify a value equal to 16* (number of files) +16

File Type: "Other"

Access Rights: "None"

Password: As Applicable

6.) Proceed to create files on the new disk as needed. These may be either data files or program files; however, any program files must not make reference to the Systems portion of the disk since it does not exist.

Note that use of any LOAD, SAVE or OPEN commands (whether in the direct mode or as part of a program) must be preceded by specifying the appropriate directory page address. For example, to return to disk with the directory at the usual address, enter:

```
POKE 9899,98
```

as well as the DEV unit select command.

Changing the Size of the Disk Directory:

1.) With the COPIER utility program, fully initialize a new disk and copy the System portion of 65U to the new disk.

2.) Using the CREATE utility program, create a directory file on the new disk with the following characteristics:

Filename: "DIREC*"

Length: Specify a value equal to 16* (number of files) +16

File Type: "Other"

Access Rights: "None"

Password: As applicable

3.) Proceed to create files on the new disk to accommodate BEXEC* and those utility programs and user files to be included on the disk.

4.) Use the COPYFI utility program to transfer existing programs/ data files to the new disk.

It is also possible to create a "data disk" which has only files storage. To do so, follow these steps:

Changing the Location of the Disk Directory:

1.) With the COPIER utility program, fully initialize a new disk and copy the System portion of 65U to the new disk.

2.) Run the CREATE utility program from an existing 65U system, but type only a carriage return in response to its first question. This leaves the CREATE program in RAM and permits the following change:

3.) Enter the disk page address (disk address/256) of the new directory as three bytes (low, mid, high) into locations

Appendix IV

Changing Size and Location of the Disk Directory

OS-65U system disks are normally allocated as follows:

Sector	Disk Address	
Ø	Ø	System boot (initialization) code
1	3584	System
2	7168	"
3	10752	"
4	14336	"
5	17920	"
6	21504	"
7 up	25088	Files

The first file within the "Files" area must be the directory for the rest of the files on the disk. The "System" area contains a directly executable copy of all the RAM resident code in the 65U system. Thus, each 65U disk normally holds a complete, fully operational system in addition to utility program and user files.

Since the directory file must be the first file in the file space, it's size - and the number of files that it can hold - is limited once the directory file has been created. Release versions of 65U contain a directory 1024 bytes in length which can hold 1024/16-1 = 63 additional file entries. (16 bytes per entry). If this number is insufficient, it is possible to build a system with a larger directory by following these steps:

Appendix B

Cassette based C4P Directions

The manual to this point, has assumed the reader is a C4P MF user. The mini-floppy disk provides a large performance benefit for the relatively small investment above a C4P (cassette) system; the chief benefits of the C4P MF are file handling and high speed data transfer. The cassette provides an economical bulk storage medium, though the data transfer rate is considerably lower than disk's rate.

If you have read this far, you have probably opted for cassette. The internal configuration of computer components is slightly different than the mini-floppy configuration. Externally, the computer and accessories should agree with Figure

The cassette recorder should be a medium price audio tape recorder. If price is indicative of quality, then $35-$50 would be a price guide. Volume and tone controls should be set at mid-range. If you do not use 11ØV AC for the recorder power, be sure to use fresh batteries. (Speed variations due to weak batteries can create errors.)