

DISPATCH DISK

NOVEMBER-1991

VOL 5 / NO 11



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EDITORIAL

Hello everyone,

At tonight's meeting there will hopefully be a discussion on the **COMMODORE** and **REPAIRS** by a Ray Mayerback. This gentleman has been handling Commodore 64's as a hobby for a while now (mainly in the repair side). If you require parts or the odd bit of hardware plus any problems and repairs, ask him at tonight's meeting or ring him at **CLUB 64** on 297 8875. Now to December's meeting, the theme will be ' **WANT DO YOU USE THE COMPUTER FOR?** ', in other words the main reason you use the computer. For example if you mainly play a game on it, bring the game in and show us, or the word processor that you use, if you mainly do typing. Also being our Christmas meeting bring in a plate of food or snacks to make this a festive occasion, plus bring the family.

COMMITTEE - The new or rearranged Committee, depending which way you look at it, were voted in last month and all bar two positions were filled. The position of Vice President and Secretary are still vacant, so if you are interested in filling one of these positions see Alex or a committee member. The remaining positions are as following:

PRESIDENT - Alex Morrison **TREASURER** - Robert Cloosterman

EDITOR - Jan Van De Belt **64/128 LIBRARIAN** - Jeff Carey

COMMITTEE MEMBERS - Michael Tippins & Malcom Brumaley

The committee has already meet and are at presently working on future demonstrations - workshops for the coming year.

LIBRARY DISKS - The club Disk Librarian has just released a couple of disks with Geopaint Xmas Pictures (see page 2), just in time for Christmas, the cost \$3 a side. There is also I'm told a range of 3 Block Print Shop graphics, downloaded from IBM's, for further details see Jeff at tonight's meeting. Also in the club Book Library, **INTRODUCTION TO BASICS PARTS 1 & 2** (with disks) are available for loan see Robert at tonight's meeting.

JAN VAN DE BELT - EDITOR



The Parallel RS-232

Direct Connect two Commodore computers via their User Ports

by Anthony Gillan

You may well ask why would you want to connect two computers together? There are fanatics out there who would connect two computers for the sheer pleasure of seeing them 'talk' together. The most common reason for interconnection is to transfer files between two incompatible computers.

If you have a perfectly good Commodore computer lying around because you upgraded to an Amiga, then that old Commodore can still have function if you connect it to the Amiga.

If you connect two similar computers together, a Commodore 128 and 64, the 64 can be used as a printer buffer or purely as an advanced RAM card for the 128.

An advanced application would have a large number of VIC-2Os or Commodore 64s running as slaves or terminals from a single Amiga or Commodore 128 host computer. This networking would be relatively cheap to set up as one disk drive and printer is required to be connected to the host only, and how much are VIC-2Os second-hand? The only problem will be writing the necessary programs to run commercial software.

RS-232 Standards

RS-232 is a computer industry communications standard. The idea behind it was to allow different types of hardware to be connected together by this 'universal' interface. The only problem is that the designers of computer systems seem to want to express their individuality in their 'all-new' system. This desire seems to have been carried through in their interpretation of the RS-232 standard. The result is that 'break-out' boxes and other types of external interfaces are commonly used to overcome these incompatibilities in versions of RS-232.

The User port on the Commodore 64 and 128, and the VIC-2O was designed to allow the the computer to be connected to a host of different computer devices including printers, modems, parallel disk drives, and even other computers. The

Commodore version of RS-232 is implemented in the form of the User Port. The differences between it and standard are:

- Commodore RS-232 uses +5 volts as logic level 1 and 0v as logic 0, while standard RS-232 uses -12v as logic 1 and +12v as logic 0.

- Commodore User Port requires a 4mm edge connector while the standard connector is a 25 way D-type connector.

To connect your Commodore to a standard RS-232 device, a modem for example, you will require an interface that overcomes the above problems. Interfaces are available commercially, but various logic chips are available to simplify building your own interface, if you are that way inclined.

Commodore serial RS-232

Commodore owners commonly use the RS-232 User Port to connect a modem to their computer. The simplest connection involves the "3-line" RS-232 interface (fig. 1). This basically involves a Data Transmission line, a Data Received line, and a Ground line being connected between the modem and computer. A modem basically is a special type of interface which allows computers to be connected to each other by way of the telephone lines instead of directly by a simple cable.

When connecting two 64s together the transmitted data line on the first 64 is connected to the received data line on the other 64 and vice versa. The ground lines are connected together. It is best to use a shielded cable instead of individual wires to stop corruption of data sent

along these lines. A simple terminal program is all that is required to get these two computers talking.

Other connections with the User Port form the basis of an 'X-line' interface which has allowances for a hardware protocol between the two computers. If one computer is sending data at a faster rate than the other can handle, then data will be lost unless the second computer tells the first to pause. This protocol allows the two computers to communicate so no data will be lost.

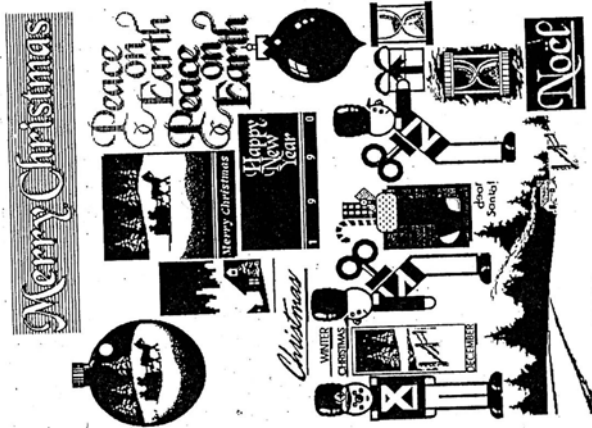
A '3-wire' interface can also use a protocol but it has to be implemented by the software controlling the data transfer. In the serial interface only one line can be used for transmitted data and one for received data. The actual electronic data sent along these lines is a logic type, either a 1 or a 0. For Commodore RS-232 these logic signals are physically voltage levels of 5 volts or 0 volts. This amounts to the fact that only binary numbers can be sent along the data lines, effectively only single bits.

For the Commodore 64, which is an 8-bit computer, there are 8 bits in every 'word'. That is, the letter 'A' (one-'word') is stored in bit-form (binary) as '01000001'. For the computer to send this word to another computer via the serial interface, where only individual bits can be sent, each bit comprising that word must be sent one after the other. This is serial data transfer.

If you could send the whole word at once it would be effectively eight times as fast as if you sent it serially, for an 8-bit machine. This method is called parallel data transfer, for each bit in the word is sent at once along different data lines, in 'parallel'. For the newer Commodores, like the Amiga range, each word consists of 16 bits, hence parallel transfer would be 16 times as fast as serial transfer. [For more information on The Serial RS-232 refer to the Commodore Reference Manual (VIC-2O,C64,C128).]

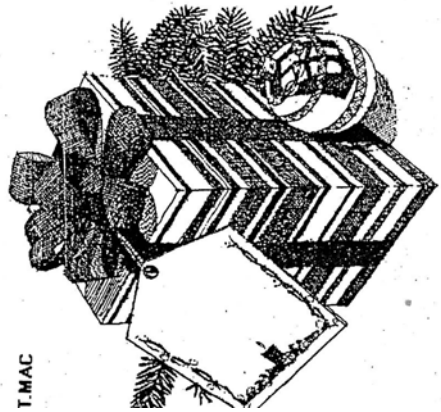
GEOPAINT XMAS PICS 1

DISK NO. 79



XMAS1990

5 GEOPAINT PICTURES WITH A CHRISTMAS THEME - S1990, WINTER PCS, SANTALMAC, GFTMAC & WREATHMAC - 8 Bonus GEDS Feets - Rutgers 24, Graffitti 24, Barman, arger, Doors 20, Tom Square, Pepsicle 24 & Shadow Box.



WREATH.MAC

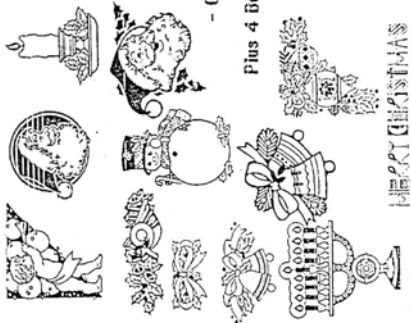


WINTER PICS

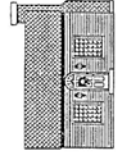


SANTA.MAC

CHRISTMAS 1



Warmest Holiday Wishes To You and Yours



HOLIDAYS 2



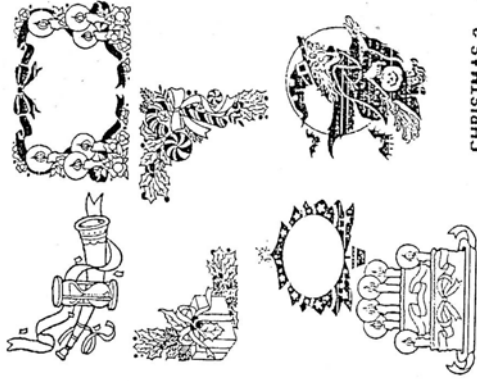
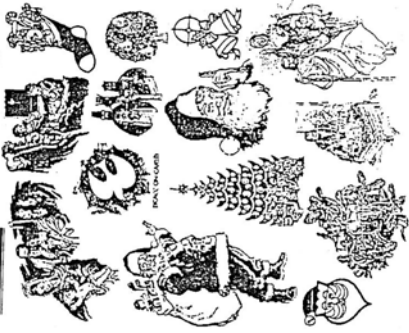
NT CHRISTMAS

DISK NO. 80

GEOPAINT XMAS PICS 2

5 GEOPAINT PICTURES WITH A CHRISTMAS THEME - Christmas 1, Christmas 2, HTZ Christmas, Xmas Art, Holidays 2 - Plus 4 Bonus GEDS Feets - Chop Suey, Princeton 24, Pepsicle 24 & Shadow Box and GeoView (a Geopaint Picture Viewer).

XMAS ART



CHRISTMAS 2

The parallel Commodore RS-232

Read up diligently in the old faithful Commodore 64 Reference Manual about the User Port and RS-232 and all the information needed to connect up your computers together, and write a terminal program is presented in front of you. The 128 manual even gives little basic routines on how to detect an incoming call on the modem. The problem lies in the fact that little is said about parallel data transfer.

To find that 'clue' to the speed of parallel transfer we must look deep into the hardware side of the Commodore computer where we find a 6526 chip called the Complex Interface Adaptor (CIA). There are two of these chips in the Commodore, one handles keyboard and joystick operations, the other handles the serial bus and the user port. These chips control input and output of the computer and its devices. Another 'selling' feature of the chip is 16 individually programmable I/O lines with full handshaking. This means that this chip is capable of handling 16-bit operations and a protocol can be used. This on an 8-bit machine?

For parallel RS-232 operations we are concerned with a few of the chip's features. For the 16-bit operations stated, two Peripheral Data Ports are used. Each port is physically represented by eight pins on the chip.

The catch in the idea of possible 16-bit transfer is quite suddenly halted here. Only one set of eight pins is connected directly to the User Port. These are from Peripheral Data Port B. The other set is split in terms of destination. Five pins connect to three pinouts on the Serial Bus. Only one pin reaches the User Port. The other two are connected to the VIC chip which controls the bank select in the system memory. Try sending data along these pins and you will run into severe problems. (see fig.2).

Connecting up

For 8-bit parallel RS-232 data transfer you will require eight lines of data as only one bit of information can be sent along a data line at once. These lines will correspond to pins C to L on the Commodore User Port (fig.3). Pins 8 and B will be re-

quired for handshaking, and pins 1, A, and N are connected for full grounding and shielding of data. A 12-core shielded cable would be best to connect two computers over a fair distance to minimize data corruption. For incompatible computers an interface will be needed as well.

Pins B and 8 on each computer will need to be connected to the alternate pin on the other to produce hardware handshaking during data transfer (fig.5).

Programming for Parallel Transfer

Why did we need to know about the CIA chip? The pinouts we are concerned with on the CIA chip correspond to actual values within the memory of the Commodore called registers. What you actually store in memory is physically realized at the pins on the CIA chip and hence the pins on the User Port. So your Commodore isn't as dead as you thought.

For our 8-bit parallel transfer we are only concerned with two registers in memory, two bytes. One is Peripheral Data Register A which is the byte that contains the data you wish to send or receive. The other is Data Direction Register A which corresponds to the bits in PDRA. If the bit in DDRA is a logical 1, the corresponding bit in PDRA will be sent to the other computer. A logical 0 indicates received data. Commodore 128

programmers will be used to this sort of thing from working with the 80 column chip.

The control software required to run the parallel transfer is as simple as that of serial data transfer. You can adapt software protocols such as Kermit and Xmodem data transfer to parallel use. Basically the data you work with is in PDRA and the direction is in DDRA. How you manipulate the data is up to you. A simple BASIC terminal program is included to demonstrate the use of these two registers for the simplest type of 'talking' between two Commodores. The routine should be written in Machine Code with some form of software protocol and buffering incoming data, like that used by the serial RS-232, to realize the true speed of parallel transfer.

Amiga to 64/128 parallel RS232

If you have an Amiga and a Commodore 64 or 128 and you do not have an interface there is another possible way to transfer files directly between the two computers.

The Parallel Printer Port on the Amiga and the Parallel User Port on the Commodore 64 and 128 are similar in terms of interfacing. The Amiga's port is even controlled by a similar I/O chip called the 8520 CIA. Fig.4 gives a register compatibility between the two computers concerning the said chips. The software method of programming given above directly accesses the chip's registers so the Amiga's device drivers can be bypassed for a time. This possible interface could be cheap and beneficial for someone wishing to send files from his old 64 to his new Amiga, not a permanent stand-alone interface. The moment the Amiga accesses the printer, your interface is history.

References

- Commodore 64 Programmer's Reference Guide; Commodore Business Machines.
- Commodore 128 Programmer's Reference Guide; Bantam Computer Books.
- The Anatomy of a Commodore 64; First Publishing Ltd.

fig.1 Serial RS-232 Interfaces

3-Line Interface (standard RS-232)

| pin | description |
|-----|-------------------------|
| 2 | Sout - transmitted data |
| 3 | Sin - received data |
| 7 | Gnd - Ground (0 volts) |

X-line Interface (Commodore User)

| pin | description |
|-----|-------------------------|
| C | Sin - received data |
| M | Sout - transmitted data |
| B | Sin - received data |
| A | Gnd - ground |
| N | Gnd - protective ground |

Direct Connections Listings

fig.2 Complex Interface Adaptor chip # 2 pinout

| pin | name | line-name | destination/notes |
|-----|-------|-----------|-----------------------------|
| 2 | PA0 | -VA14 | VIC memory banking |
| 3 | PA1 | -VA15 | VIC memory banking |
| 4 | PA2 | PA2 | pin M - User Port |
| 5 | PA3 | ATN OUT | " 9 - User/pin 3 Serial Bus |
| 6 | PA4 | CLK OUT | " 4 - Serial |
| 7 | PA5 | DATA OUT | " 5 - Serial |
| 8 | PA6 | CLK IN | " 4 - Serial |
| 9 | PA7 | DATA IN | " 5 - Serial |
| 10 | PB0 | PB0 | " C - User |
| 11 | PB1 | PB1 | " D " |
| 12 | PB2 | PB2 | " E " |
| 13 | PB3 | PB3 | " F " |
| 14 | PB4 | PB4 | " H " |
| 15 | PB5 | PB5 | " J " |
| 16 | PB6 | PB6 | " K " |
| 17 | PB7 | PB7 | " L " |
| 18 | -PC | PC2 | " 8 " |
| 24 | -FLAG | -FLAG | " B " |

fig.3 User Port Pin-Out

| pin | description | notes |
|-----|-------------|--------------------------------|
| 1 | ground | |
| 2 | +5 volts | (100mA max) |
| 3 | RESET | |
| 4 | CNT1 | Serial Port Counter from CIA#1 |
| 5 | SP1 | Serial Port from CIA#1 |
| 6 | CNT2 | Serial Port Counter form CIA#2 |
| 7 | SP2 | Serial Port from CIA#2 |
| 8 | PC2 | handshaking line form CIA#2 |
| 9 | -Serial ATN | device attention on serial bus |
| 10 | 9VAC +phase | power transformer (50mA max) |
| 11 | 9VAC -phase | power transformer |
| 12 | ground | |
| A | ground | |
| B | -FLAG | handshake input form CIA#2 |
| C | PB0 | bit 0 - port B CIA#2 |
| D | PB1 | bit 1 - " |
| E | PB2 | bit 2 - " |
| F | PB3 | bit 3 - " |
| H | PB4 | bit 4 - " |
| J | PB5 | bit 5 - " |
| K | PB6 | bit 6 - " |
| L | PB7 | bit 7 - " |
| M | PA2 | I/O line CIA#2 (CB2-VIA) |
| N | ground | |

fig.4 6526 and 8520 CIA Memory Registers

| Name | 64/128 Address | Amiga Address | Description |
|------|----------------|---------------|-----------------------|
| PRA | \$DD00 | \$BFEO01 | Serial Bus / Disk I/O |
| PRB | \$DD01 | \$BFE101 | User Port / Printer |
| DDRA | \$DD02 | \$BFE201 | Data Direction |
| DDRB | \$DD03 | \$BFE301 | Data Direction |

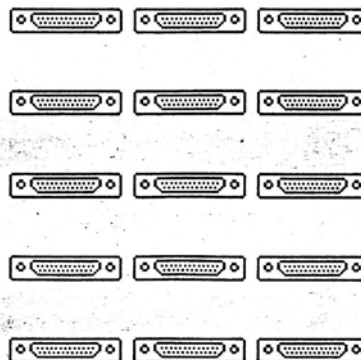
fig 5. Cable Wiring

| User Port1 | Pins | (shielding) | Pins | User Port 2 |
|-------------|------|---------------|------|------------------|
| ground | 1 | ----- | 1 | ground |
| +5 Volts | 2 | --optional-- | 2 | +5 Volts |
| Handshake | 8 | --handshake-- | B | handshake input |
| Shake | B | --handshake-- | 8 | handshake output |
| ground | A | ----- | A | ground |
| no-connect | N | - sh ----- | N | protectiveground |
| 8Data Lines | C-L | ----- | C-L | 8Data Lines |

Parts List: 2 x Commodore Edge Connectors
 (Cat. PA-0888 Jaycar Electronics)
 approx. 1 metre 12-core data cable
 (Cat. W-2041 Dick Smith Electronics)

Assembly:

Solder wire as per above connections. Note pin N on user port 2 goes to shielding on cable - whereas pin N on user port 1 is a no connection. Check continuity with an Ohmmeter once complete.
 (NB: Do not solder cable or alter wires whilst connected to user port. Never add or remove cable whilst either computer is on!).



/received data
 /received data
 /request to send
 /data terminal ready
 /ring indicator
 /carrier detect
 /unassigned
 /clear to send
 /data set ready
 /transmitted data



DISPATCH DISK NOTES



COMMITTEE 1991-92

PRESIDENT- A. Morrison 085 56-5013
 VICE PRESIDENT- Position Vacant
 SECRETARY- Position Vacant
 TREASURER- R. Cloosterman 382-0781
 NEWSLETTER.ED. - J. Van de Belt 382-8660
 64/128 LIBRARIAN- J. Carey 294-8447
 COMMITTEE MEMBER- M. Tippins 381-3181
 COMMITTEE MEMBER- M. Brumaley 382-2814

Our Disk and Magazine libraries are open at each general meeting from 7:30pm.

If you have any contributions for the newsletter, see Alex, Jeff or Jan.

NEXT MEETING

Our next general meeting will be held on the 18th December at 7:30pm.

SUBJECT-What do you use your Commodore for?

LOCATION-Meetings are held in the house behind the Salvation Army hall, 186 Elizabeth rd in Morphett Vale, just in from Beach rd.

DOOR FEE-There is a door fee of \$2 per family, which includes the Newsletter plus coffee/tea and biscuits.

MEETING RULES

- 1) NO SMOKING
- 2) NO DRINKING
- 3) NO SWEARING

Through the generosity of the Salvation Army, we are allowed to use the facilities in this house, in return for which we give them a relatively small donation. We ask for your co-operation in respect to the above.

While we can not control what people do away from our club meetings, Piracy of copyright material can not be condoned at our meetings.

DEMONSTRATION TOPICS- If you have any requests for topics you would like to see demonstrated, speak up, even, if it has already been done, and you missed it let us know. If there is reasonable interest, it can probably be repeated.

DISCLAIMER

The views expressed in this newsletter are those of the writers, and are not necessarily those of the club's committee or members.

The use of the word "COMMODORE" in no way implies any connection with any organization bearing that name.

No part of "THE DISPATCH DISK" may be copied or reproduced in any way without the written permission of the committee or the author.

WANTED

ASSISTANCE REQUIRED- THE CLUB STILL NEEDS THE ASSISTANCE OF SEVERAL MEMBERS IN THE FOLLOWING AREAS:-

- 1) Newsletter contributions.
- 2) Expert Register. Please help us to help others with their problems.
- 3) Vice President
- 4) Secretary

FUTURE MEETINGS- Help us to spread the word of our existence. The club has available various notices which could be placed where people will see them. Your local supermarket usually has a notice board as do some newsagencies and delicatessens. See the club President or a committee member to obtain some of these notices and spread the word of our User Group.

FOR SALE

PUBLIC DOMAIN SOFTWARE- We have a large range of PUBLIC DOMAIN Software for sale through library. Prices represents very good value. Catalogue disks are also available for only \$1.00. See Jeff at tonight's meeting for any enquires.

CHEAP DISKS- The club makes bulk purchases of disks which helps members to save some money. A packet of 10 is \$6.00. See Rob at tonight's meeting.

MEMBERSHIP FEES

the scale of membership fees for this year will be as follows:-

| | |
|----------------------------|---------|
| Joining fee for new member | \$5.00 |
| Membership fee (to A.G.M.) | \$10.00 |
| Postal Members | \$18.00 |

All previous members who have not renewed their membership are unfinancial and will have to rejoin the club and pay joining fee again in order to add items to the club's disk and magazine libraries, we need money, so please pay up promptly.

PRODUCED BY 64/128 USERS