Commdore Plus/4 RS232 Interface

Researched and published by Claude Nehme (DeadTED)

This interface is based on the interface published in Byte Magazine March 1985, Vol. 10, No. 3 for the Commodore 64, and adapted to be compatible with the Commodore Plus/4 userport.

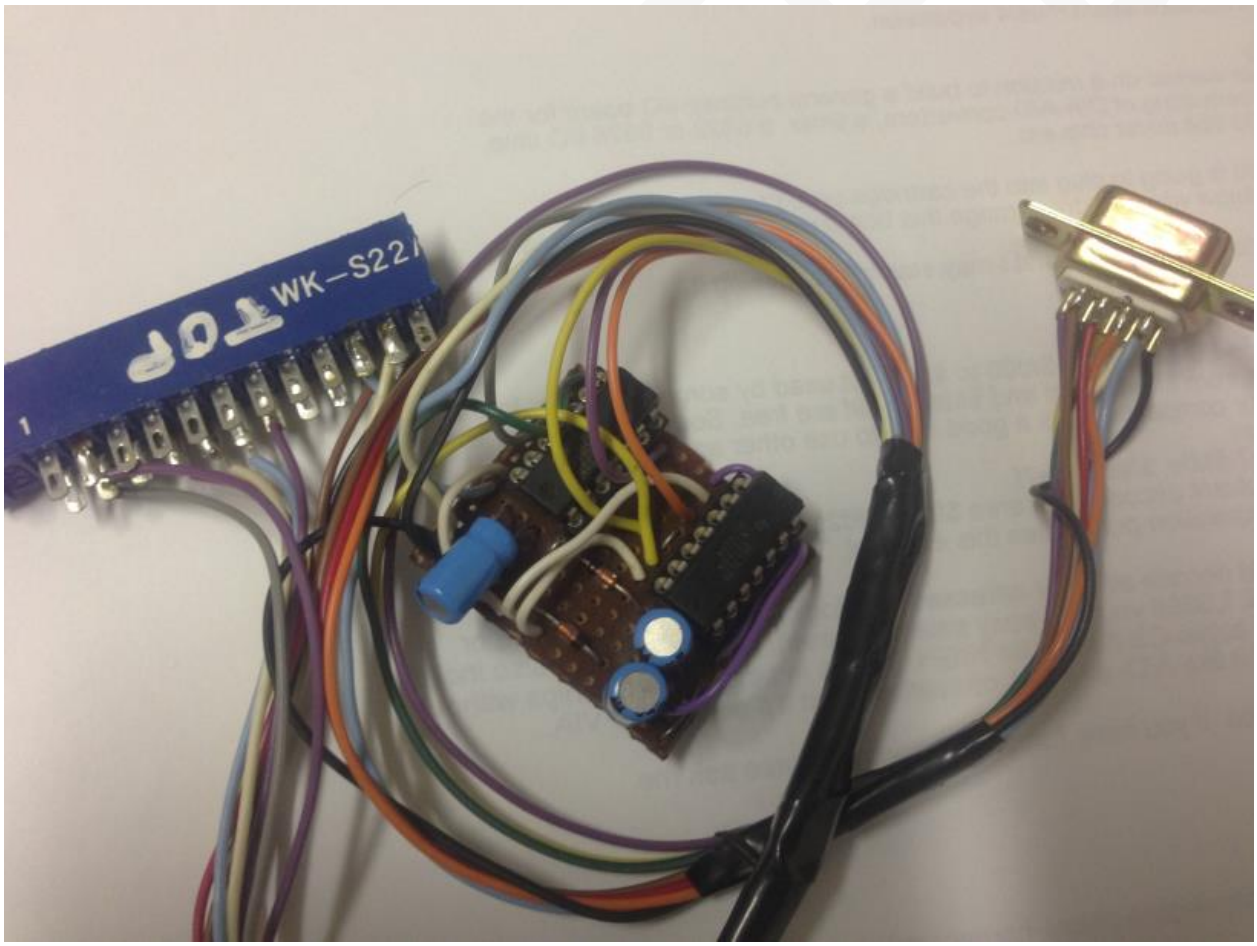
Caution !

If this device is not constructed and used ciorrectly, it may lead to damage to your Commodore Plus/4.

Note !

The Author takes no responsibility for any damage resulting to your Commodore Plus/4 as a result of the use of this device.

The Author cannot offer any support, guidance or advice regarding the creation and use of this device.



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What you need

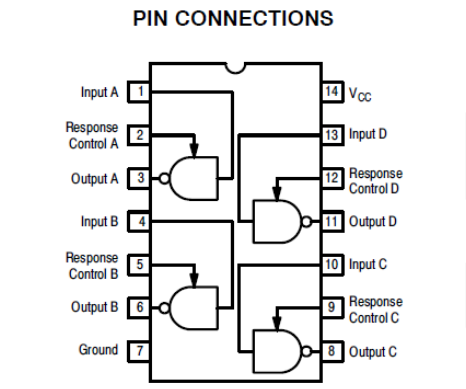
1. 1 x Veroboard 14 holes wide (labelled A-N) by 12 holes high (labelled 0-11), refer to figure 2.
2. 3 x 100uF capacitors (C1, C2, C3)
3. 1x 1488 Quad line driver rs-232 (U2)
4. 1x 1489 Quad line receiver rs-232 (U1)
5. 3x signal diodes 1N4148 (D1, D2, D3)
6. 1x userport connector
7. 1x 9 Pin D-connector male plug
8. Some multi-coloured wire
9. Soldering iron
10. Cutters
11. Solder

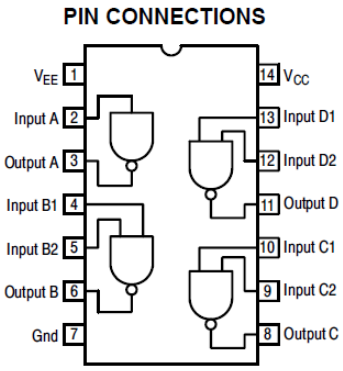
Instructions

You can use the diagram in Appendix A, as a guide to the Veroboard layout. **Do not use the diagram to construct the board, use steps 1 through to 4 detailed below.**

Step 1

Solder the legs of these components into the corresponding holes on the Veroboard.

<table>
<tr>
<td>U1 MC1489:
 

Pin 1 (B0), Pin 2(B1), Pin 3 (B2), Pin 4 (B3), Pin 5 (B4), Pin 6(B5), Pin 7(B6)
Pin 14(E0), Pin 13(E1), Pin 12(E2), Pin 11(E3), Pin 10(E4), Pin 9(E5), Pin 8(E6)</td>
<td>U2 MC1488:
 

Pin 1(J0), Pin 2(J1), Pin 3(J2), Pin 4(J3), Pin 5(J4), Pin 6(J5), Pin 7(J6)
Pin 14(M0), Pin 13(M1), Pin 12(M2), Pin 11(M3), Pin 10(M4), Pin 9(M5), Pin 8(M6)</td>
</tr>
<tr>
<td>C1: +ve leg(B7), -ve leg(D7)
C2: +ve leg(L7), -ve leg(L8)
C3: +ve leg(L10), -ve leg(L11)</td>
<td>D1: +ve leg(E7), -ve leg(E8)
D2: +ve leg(J7), -ve leg(F7)
D3: +ve leg(F10), -ve leg(J10)</td>
</tr>
</table>

Step 2

Soldering the jumper wires, you will need 7 pieces of wire, roughly 3cm each. Connect the following pairs of holes with the pieces of wire, soldering each end to the Verobaord underneath.

J1: I0 to N7 J2: N0 to N10 J3: N8 to N11	J4: I6 to G11 J5: I1 to F11 J6: A6 to E11 J7: I3 to I4

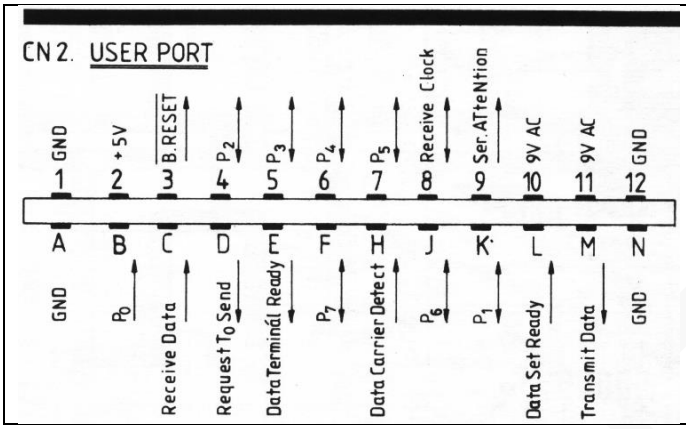
Step 3

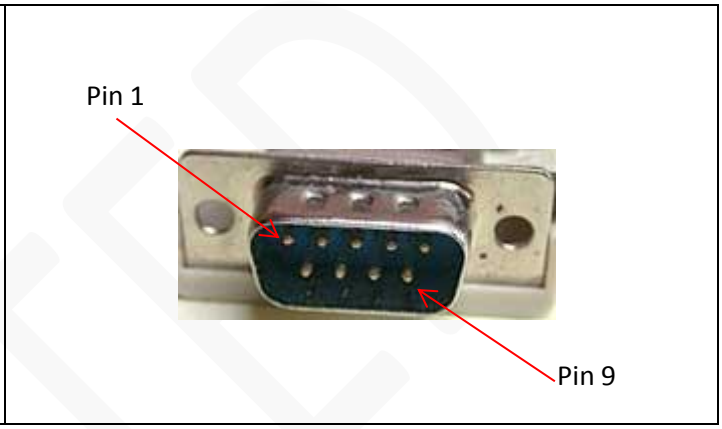
Break the tracks these holes.

C0 to C7, K0 to K6, G0 to G6, H7, H10

Step 4

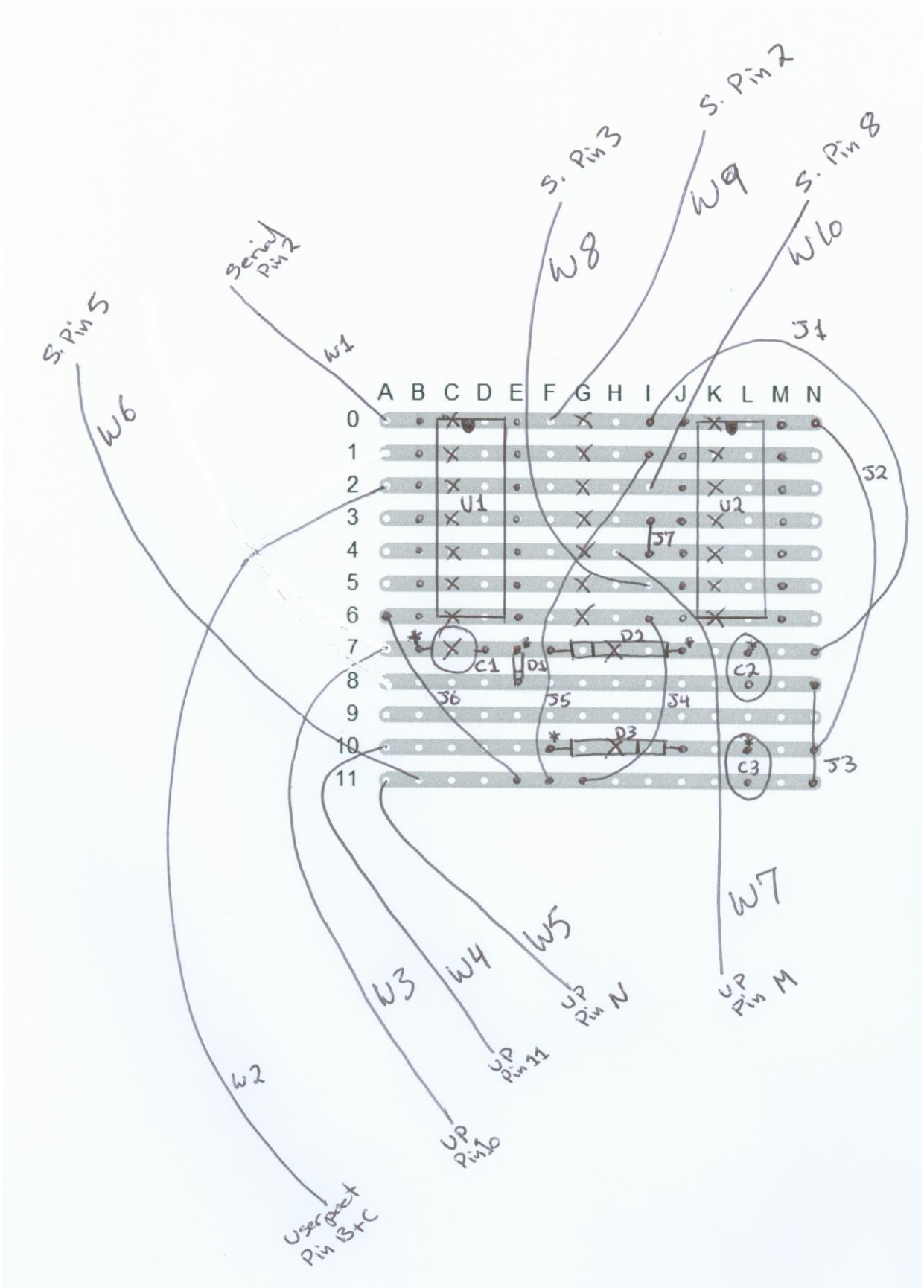
Cut 15 wires 15cm long. These wires will be soldered between the Veroboard, the 9 Pin serial male plug and the Commodore Plus/4 UserPort connector. Note the userport connector diagram below is laid out with the back of the computer pointed towards your face, in other words imagine you are looking at the connector, while reading the diagram





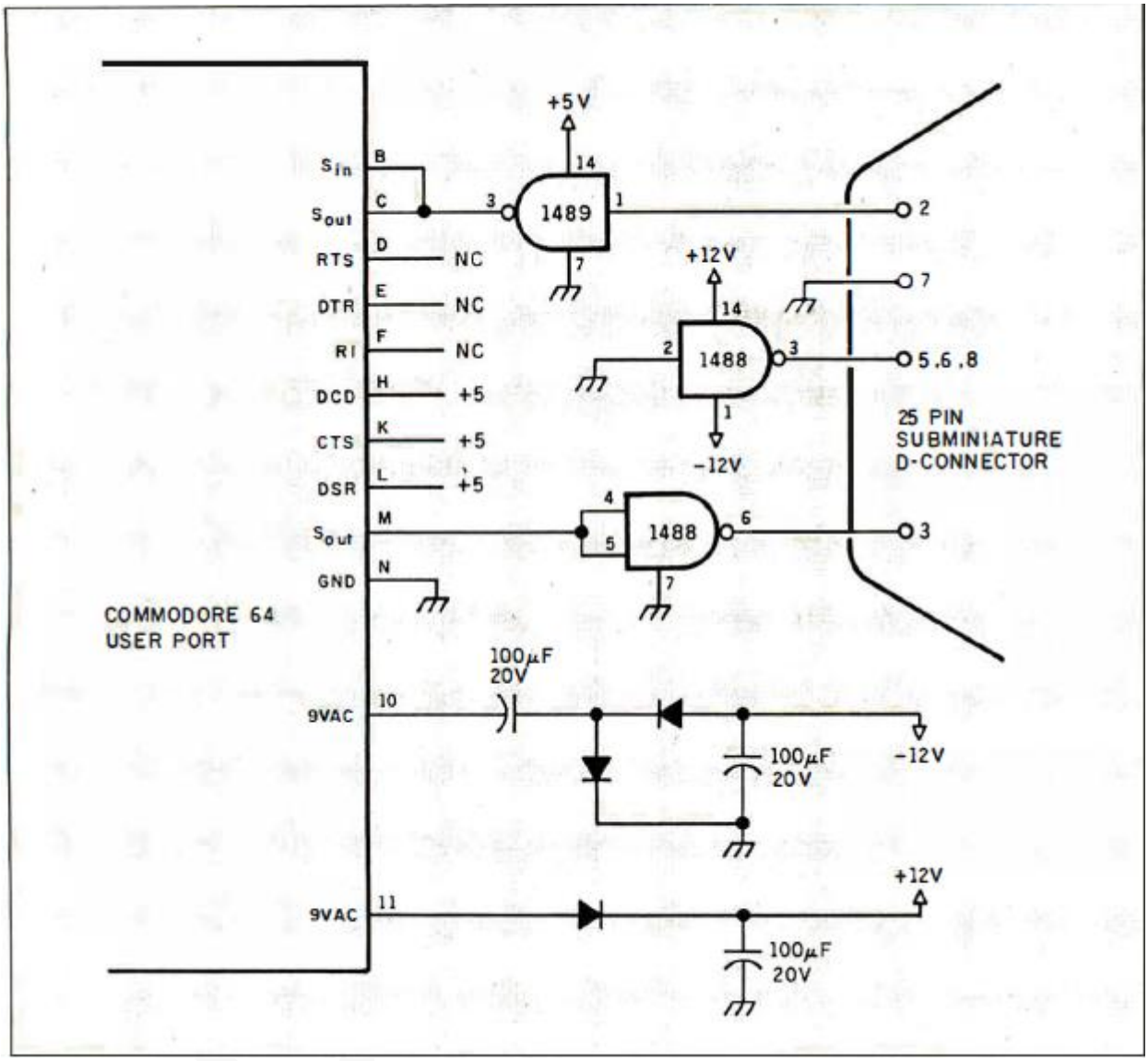
Wire No.	Veroborad hole	9 Pin Serial Male	Userport Connector
W1	A0	Pin 2	
W2	A2		Pins B and C
W3	A7		Pin 10
W4	A10		Pin 11
W5	A11		Pin N
W6	B11	Pin 5	
W7	H4		Pin M
W8	I5	Pin 3	
W9	F0		Pin 2
W10	I2	Pin 8	
W11		Pin 1	Pin H
W12		Pin 4	Pin E
W13		Pin 6	Pin L
W14		Pin 7	Pin D
W15		Pin 9	Pin F

Appendix A – Veroboard Layout



Appendix B – RS-232 Circuit Diagram

RS-232 Circuit diagram from Byte Magazine 1985.



Appendix C – Commodore Plus/4 RS-232 Userport lines.

Commodore Plus/4 – RS-232 Userport Lines. Source: Page 210, Commodore Plus/4 User Manual.

Table 1. RS-232 Port Lines

PIN ID	DESCRIPTION	EIA	ABV	OUT
C	RECEIVED DATA	(BB)	Sin	IN
D	REQUEST TO SEND	(CA)	RTS	OUT
E	DATA TERMINAL READY	(CD)	DTR	OUT
F	RING INDICATOR	(CE)	RI	IN
H	RECEIVED LINE SIGNAL	(CF)	DCD	IN
J	UNASSIGNED	( )	XXX	IN
K	CLEAR TO SEND	(CB)	CTS	IN
L	DATA SET READY	(CC)	DSR	IN
B	RECEIVED DATA	(BB)	Sin	IN
M	TRANSMITTED DATA	(BA)	Sout	OUT
A	PROTECTIVE GROUND	(AA)	GND	
N	SIGNAL GROUND	(AB)	GND	

Appendix D – Programs to Exchange Files Between Plus 4 and IBM PC

Plus4lnk.bas (Quick Basic - IBM PC)

```
DECLARE SUB RECFILE ()
DECLARE SUB SENDFILE ()
DECLARE SUB RECTEXT ()
DECLARE SUB SENDTEXT ()

OPEN "COM1:300,N,8,1,CD0,CS0,DS0,OP0,RS,TB2048,RB2048" FOR RANDOM AS #1

DO UNTIL CHOICE = 9
CLS
CHOICE = 0
PRINT "SEND MENU"
PRINT "==============="
PRINT "1.SEND TEXT"
PRINT "2.SEND FILE"
PRINT "--------------"
PRINT "RECEIVE MENU"
PRINT "==============="
PRINT "3.RECEIVE TEXT"
PRINT "4.RECEIVE FILE"
PRINT "--------------"
PRINT "9.EXIT"
PRINT "--------------"
INPUT "ENTER CHOICE"; CHOICE
IF CHOICE = 4 THEN RECFILE
IF CHOICE = 3 THEN RECTEXT
IF CHOICE = 2 THEN SENDFILE
IF CHOICE = 1 THEN SENDTEXT
LOOP

CLOSE 1

SUB RECFILE
    CLS
    PRINT "COPY FILE FROM REMOTE"
    PRINT "======================"
    INPUT "Enter Filename: "; n$
    OPEN n$ FOR OUTPUT AS #2
    DO UNTIL B <> 0
     LINE INPUT #1, X$
     PRINT #2, X$
     PRINT X$
     B = INSTR(X$, "READY.")
    LOOP
    CLOSE 2
    PRINT "FILE COPY COMPLETE.PRESS A KEY"
    DO: LOOP UNTIL INKEY$ <> CHR$(0)
END SUB

SUB RECTEXT

DO
 INPUT #1, X$
 PRINT X$
LOOP UNTIL X$ = "X:EXIT"

END SUB

SUB SENDFILE
    CLS
    PRINT "COPY FILE TO REMOTE"
    PRINT "===================="
    INPUT "Enter Filename: "; n$
    OPEN n$ FOR INPUT AS #2
    DO UNTIL EOF(2)
```

```
     LINE INPUT #2, X$
     PRINT #1, X$
     PRINT X$
     REM B = INSTR(X$, "READY.")
    LOOP
    CLOSE 2
    PRINT "FILE COPY COMPLETE.PRESS A KEY"
    DO: LOOP UNTIL INKEY$ <> CHR$(0)
END SUB

SUB SENDTEXT

DO
 INPUT X$
 PRINT #1, X$
LOOP UNTIL X$ = "X:EXIT"

END SUB
```

Ibmlink.prg (Plus 4)

```
1 SCNCLR
2 PRINT CHR$(14)
100 POKE 65301,12:PRINT"":POKE 65305,9:POKE 65301,0:PRINT CHR$(152):POKE 65289,23
110 VOL 8:SOUND1,340,20
120 FOR H=3085 TO 3096:READ A:POKE H,A:NEXT H
125 FOR H=3334 TO 3344:READ A:POKE H,A:NEXT H
130 OPEN 5,2,2,CHR$(22)+CHR$(5)
140 T=3165:T0=0:R=3405:R0=0:R1=0
150 REM MAIN
160 POKE T+T0,60:POKE T+T0,32:GET T$
170 IF T$="" THEN GOTO 270
180 IF T$<>CHR$(20) THEN GOTO 210
190 IF T0>0 THEN T0=T0-1
200 POKE T+T0,32:GOTO 270
210 IF T$<>CHR$(13) THEN 240
220 GOSUB 700
230 GOTO 270
240 IF T+T0>=R-80 THEN 260
250 POKE T+T0,ASC(T$):T0=T0+1:GOTO 270
260 POKE 65305,1:FOR H=0 TO 15:NEXT H:POKE 65305,9
270 GOSUB 800
280 GOTO 150
700 REM TRANSMIT
710 PRINT#5,CHR$(62);:PRINT#5,CHR$(32);
720 FOR K=T TO T+T0-1
730 PRINT#5,CHR$(PEEK(K));:POKE K,32
740 GOSUB 800
750 NEXT K
760 PRINT#5,CHR$(13);:T0=0
770 RETURN
800 REM RECEIVE
810 POKE R+R0,60:POKE R+R0,32:GET#5,R$
820 IF R$="" THEN GOTO 930
830 IF R$<>CHR$(13) THEN 900
840 VOL 8:SOUND1,990,20
850 IF R1=40 OR R1=0 THEN 870
860 POKE R+R0,32:R1=R1+1:R0=R0+1:GOTO 850
870 R1=0:IF R+R0=4085 THEN R0=0
880 FOR H=R+R0 TO R+R0+39:POKE H,32:NEXT H
890 GOTO 930
900 POKE R+R0,ASC(R$):R0=R0+1:R1=R1+1
910 IF R1=40 THEN R1=0
920 IF R+R0=4085 THEN R0=0
930 RETURN
950 DATA 42,32,84,82,65,78,83,77,73,84,32,42
960 DATA 42,32,82,69,67,69,73,86,69,32,32
970 END
```