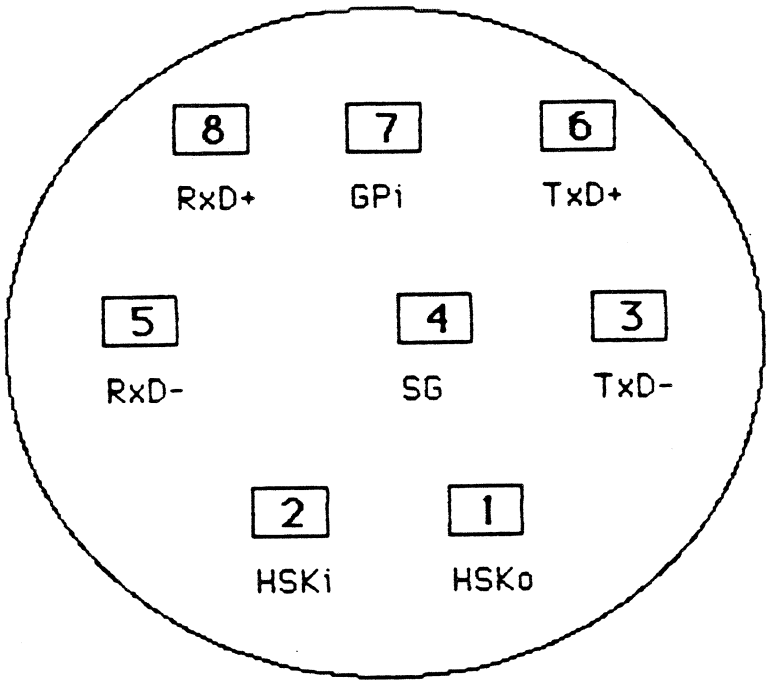
HARDWARE CONNECTORS

JANUARY 25, 1985

MEMORY EXPANSION CONNECTOR

1. GROUND	■	44. GROUND
2. + 5 V	●	43. + 5 V
3. FRA9	●	42. A15
4. FRA8	●	41. A14
5. D2	●	40. A13
6. FRA6	●	39. A12
7. FRA3	●	38. A11
8. FRA4	●	37. A10
9. FRA5	●	36. D1
10. FRA7	●	35. CRAS
11. + 5 V	●	34. GROUND
12. FR/W	●	33. D3
13. FRA0	●	32. N.C.
14. FRA2	●	31. PH2
15. FRA1	●	30. D5
16. D7	●	29. D4
17. CCAS.L	●	28. D6
18. CROW0	●	27. MEMSIZE
19. CROW1	●	26. CSEL.L
20. CROMSEL.L	●	25. D0
21. +5 V	●	24. + 5 V
22. GROUND	●	23. GROUND

SERIAL PORT CONNECTORS



Both Serial Port 1 and Serial Port 2 have the same pin out

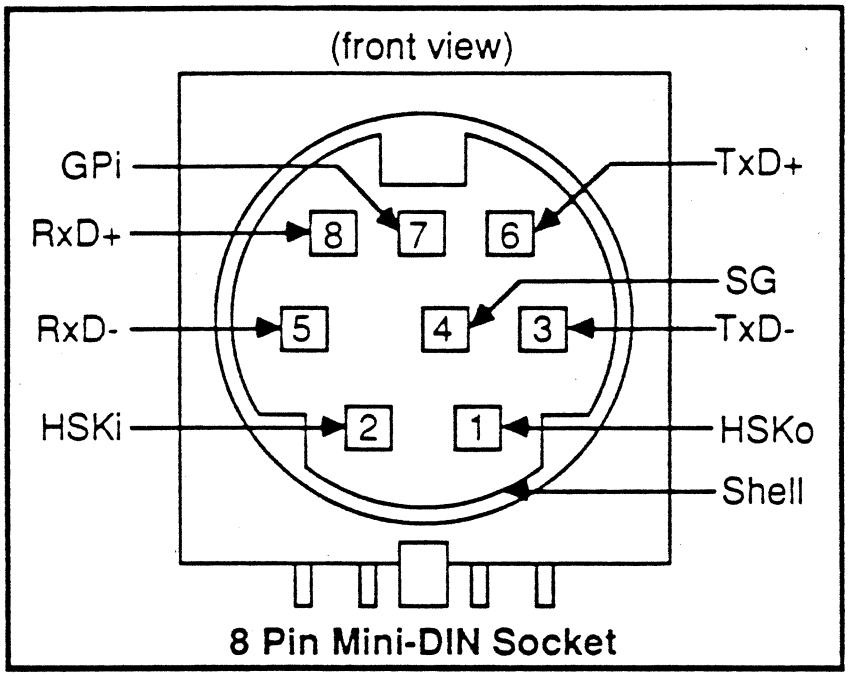
1. Handshake Out (HSKo)
2. Handshake In (HSKi)
3. Transmit Data Minus (TxD-)
4. Signal Ground (SG)
5. Receive Data Minus (RxD-)
6. Transmit Data Plus (TxD+)
7. Goes to DCD input on SCC (GPi)
8. Receive Data Plus (Rxd+)

NEW

Mini-DIN Connector Scheme

The pinout shown below has been proposed for the 8-pin mini-DIN sockets to be used on the Macintosh, ImageWriter II, low-cost modem and Small File Server. This configuration allows versatile modem control, working not only with Apple supplied modems, but with modems that conform to RS-232C or CCITT V.24 signal conventions. Voltage levels at the interface will be RS-423 and CCITT V.10 compatible.

All sockets shall be wired as shown:



8 Pin Mini-DIN Socket

Pin	EIA RS-232	CCITT V.24	Description	DTE	DCE
1	CD	108/2	DTR	FROM	TO
2	CC	107	DSR	TO	FROM
3	BA	103	TxD-	FROM	TO
4	AB	102	SG	-	-
5	BB	104	RxD-	TO	FROM
6	-	-	-	FROM	TO
7	CF	109	DCD	TO	FROM
8	-	-	-	*	FROM
shell	AA	(obs. 101)	PG	-	-

Table 1 - Recommended Signal Conventions

Note: * must be driven to SG

Pin	AppleTalk	GP	Description	DTE	DCE
1	-	HSKo	out hsk	FROM	TO
2	(HSK)	HSKi	in hsk/clk	TO	FROM
3	TxD-	TxD-	TxD-	FROM	TO
4	-	SG	SG	-	-
5	RxD-	RxD-	RxD-	TO	FROM
6	TxD+	TxD+	TxD+	FROM	TO
7	-	GPi	in hsk	TO	FROM
8	RxD+	RxD+	RxD+	TO	FROM
shell	(PG)	PG	PG	-	-

Table 2 - Recommended Signal Conventions AppleTalk and General Purpose

All "scrambling" will be done in the cable. Only two basic cable types (optionally a third) are needed. Figure 1 shows the cable that is required to make DTE-DCE type connections. This cable would have an 8 pin mini-DIN plug ("male") on one end and a DB-25 plug ("male") on the other. This would be used to interface to RS-232 or CCITT V.28 modems. Pin 8 on the Macintosh socket must be connected to SG, this can be done with a second wire to pin 7 of the DB25 plug.

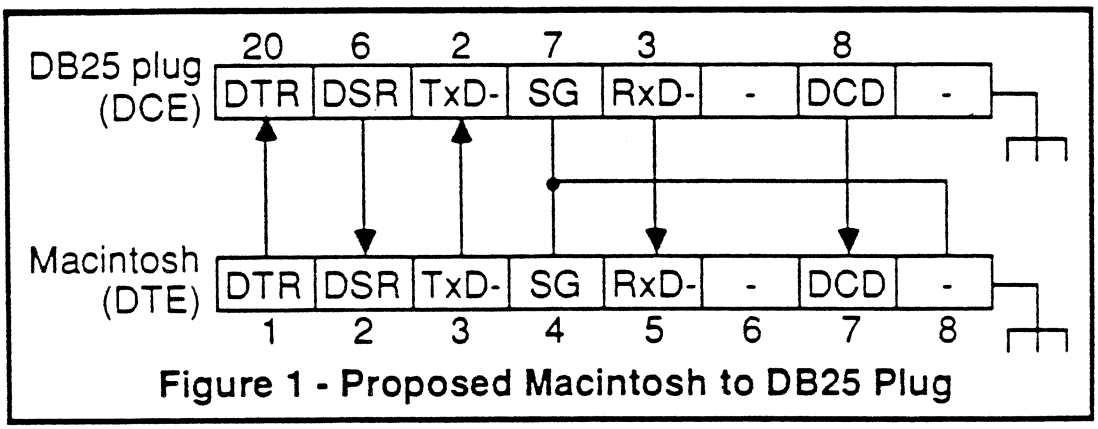


Figure 1 - Proposed Macintosh to DB25 Plug

An optional cable for general purpose use is shown in figure 1a. This cable would function as a "null modem" cable and allow DTE-DTE type connections. This would also be used primarily for connecting the Macintosh to printers, some modems, etc. This cable would have an 8 pin mini-DIN plug ("male") on one end and a DB-25 plug ("male") on the other. Pin 8 on the Macintosh socket must be connected to SG, this can be done with a second wire to pin 7 of the DB25 plug.

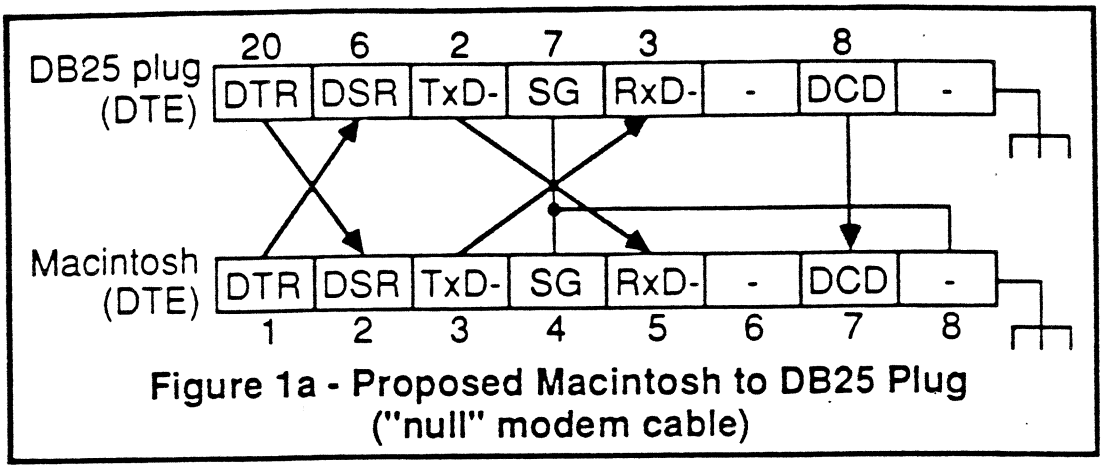


Figure 1a - Proposed Macintosh to DB25 Plug ("null" modem cable)

Finally, the third cable, shown in figure 2, is used for connections to Apple printers and modems and to the AppleTalk transformer box. It would function as a "null modem" cable and allow DTE-DTE type connections. This cable would have an 8 pin mini-DIN plug ("male") on each end. For AppleTalk connections, this cable would have an 8 pin mini-DIN plug ("male") on one end and the transformer box on the other. This configuration utilizes differential transmit and receive.

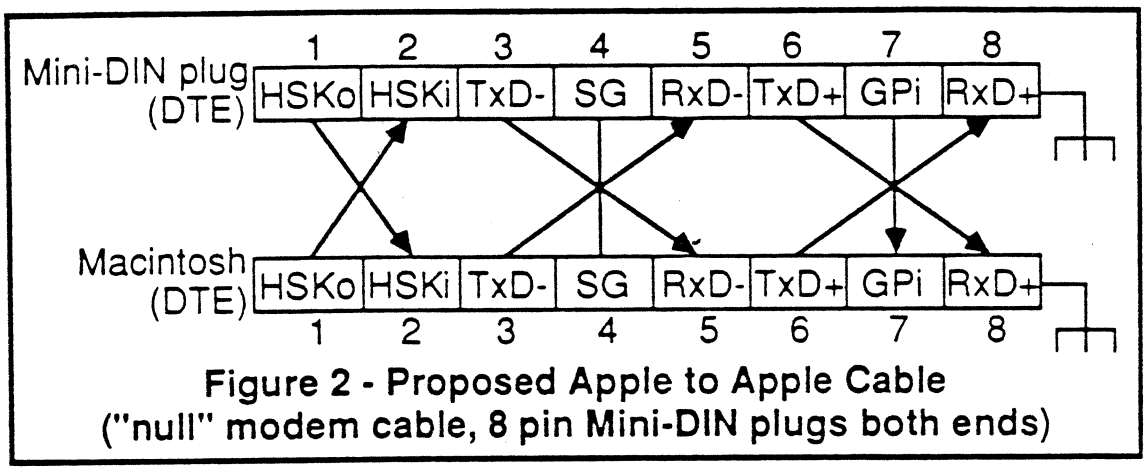


Figure 2 - Proposed Apple to Apple Cable ("null" modem cable, 8 pin Mini-DIN plugs both ends)

Synchronous Modems:

To connect the Macintosh to a synchronous modem, a different cabling arangement is needed. These modems require half duplex support, and the ability to accept transmit and receive clocks (or a single receive clock) from the modem. The more common configuration is shown in figure 3 and the signal conventions explained in table 3. This configuration uses RTS to control the transmit/receive operation of the modem. Since no CTS is provided, the synchronous driver software must "time" the RTS-CTS turnaround. The transmit clock and receive clock are provided by the modem's TSET and RSET lines.

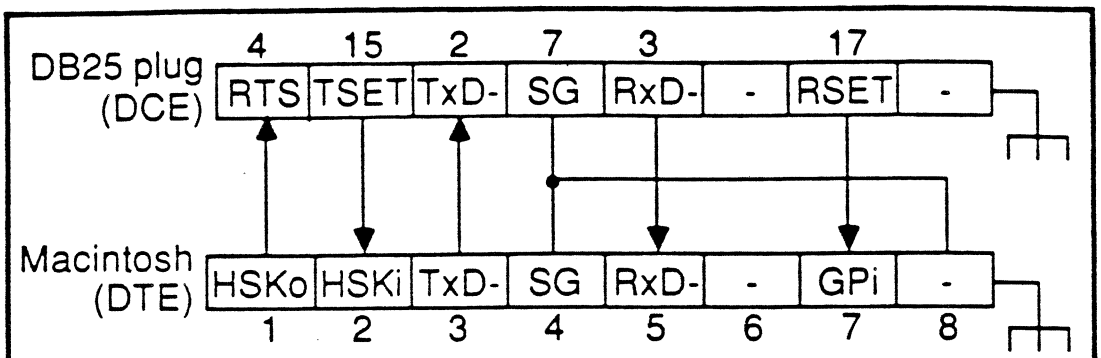


Figure 3 - Proposed Macintosh to DB25 Plug Synchronous Modem Applications

Pin	EIA RS-232	CCITT V.24	Description	DTE	DCE
1	CA	105	RTS	FROM	TO
2	DB	114	TSET	TO	FROM
3	BA	103	TxD-	FROM	TO
4	AB	102	SG	-	-
5	BB	104	RxD-	TO	FROM
6	-	-	-	FROM	TO
7	DD	115	RSET	TO	FROM
8	-	-	-	*	FROM
shell	AA	(obs. 101)	PG	-	-

Table 3 - Recommended Signal Conventions Synchronous Modem Applications

Note: * must be driven to SG

An alternative configuration is shown in figure 4 and the conventions shown in Table 4. This configuration provides a CTS handshake for automatic turnaround of the half duplex line. To provide this extra handshake line, the receive clock from the modem is also used as an externally provided transmit clock (EIA RS-232 "DA", CCITT V.24 "113") for the modem. This is input to the modem on pin 24 of the DB25 plug. Note: not all synchronous modems allow an external transmit clock, some allow the external transmit clock only as a "strapping" option. Please consult the specific modem documentation before this is used.

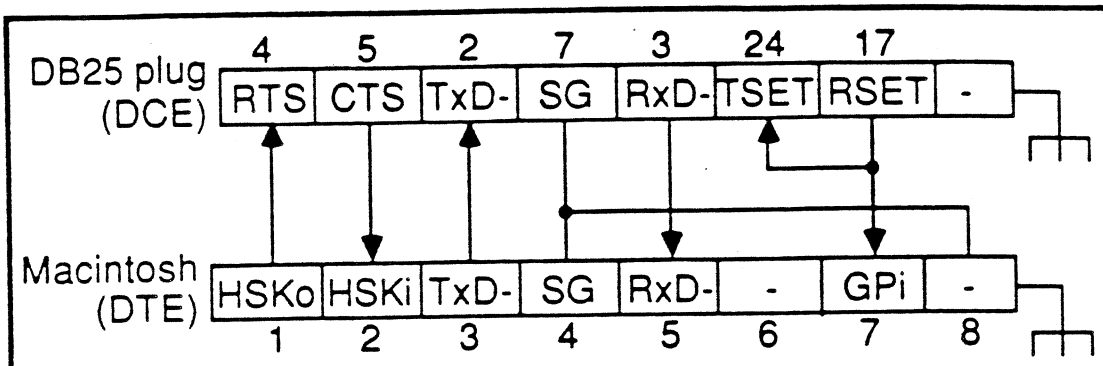


Figure 4 - Proposed Macintosh to DB25 Plug Synchronous Modem Applications (with CTS and external clock option)

Pin	EIA RS-232	CCITT V.24	Description	DTE	DCE
1	CA	105	RTS	FROM	TO
2	CB	106	CTS	TO	FROM
3	BA	103	TxD-	FROM	TO
4	AB	102	SG	-	-
5	BB	104	RxD-	TO	FROM
6	-	-	-	FROM	TO
7	DD	115	RSET	TO	FROM
8	-	-	-	*	FROM
shell	AA	(obs. 101)	PG	-	-

Table 4 - Recommended Signal Conventions Synchronous Modem Applications (with CTS and external clock option)

Note: * must be driven to SG