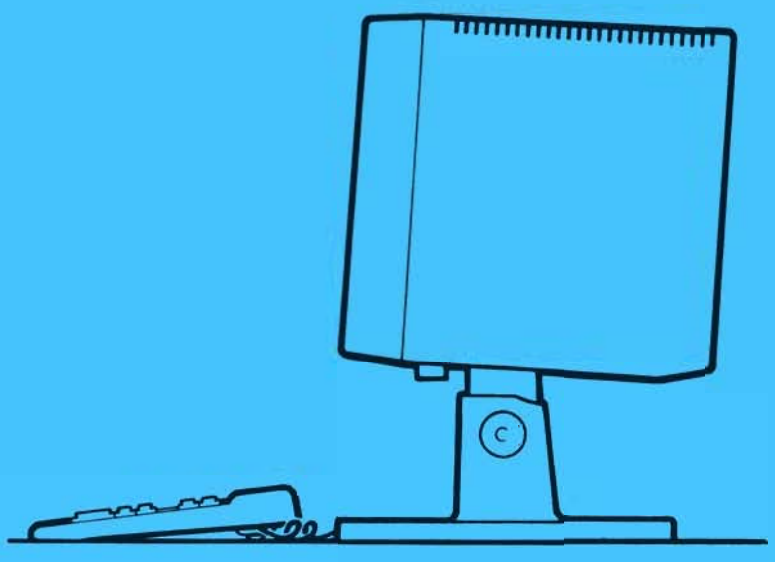
TANDBERG DATA

TDV 2200 SERIES
DISPLAY TERMINALS

TDV 2200
Specifications & Installation Guide



TDV 2200
Specifications & Installation Guide

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Every effort has been made to avoid errors in text and diagrams. However, Tandberg Data A/S assumes no responsibility for any errors which may appear in this publication.

It is the policy of Tandberg Data A/S to improve products as new techniques and components become available. Tandberg Data A/S therefore reserves the right to change specifications at any time.

We appreciate any comments on this publication.

CONTENTS

1. ELECTRICAL SPECIFICATIONS

Input power : 50 W (80 VA)

Inrush current : 25 A

Line voltage range : 230 V +10% -15%

or 115 V +10% -15% (Jumper on Power/Deflection 1)

Loss of 3 half cycles will not bring output voltages outside specs. Time between two losses > 5 sec.

WARNING!

The wall outlet, to which the power plug is connected, MUST BE GROUNDED.
To prevent electrical shock, do not remove covers! If anything fails, leave the repairs to a qualified technician.

WARNING!

The TDV 2200 terminal complies with the limits for a Class B computing device pursuant to Subpart J of Part 15 of FCC Rules. Only equipment complying with Class B limits may be attached to this terminal. Operation with non-complying equipment is likely to result in interference to radio- and TV-reception.

2. ENVIRONMENTAL SPECIFICATIONS

2.1 Definitions

Operating : The unit is unpacked and power is turned on.

Storage : The unit is unpacked and power is turned off.

Transport : The unit is packed and power is turned off.

Equipment : TDV 2200 series terminal in any configuration as defined by Tandberg Data, including keyboard.

2.2 Temperature, Relative Humidity and Atmospheric Pressure

	TEMPERATURE	RELATIVE HUMIDITY	ATMOSPHERIC PRESSURE
Operating	0 to +40 °C	15 to 80%	86 to 106 kPa (860 - 1060 mbar)
Storage	0 to +70 °C	15 to 90%	45 to 106 kPa (450 - 1060 mbar)
Transport	-25 to +70 °C	Any non-condensing	45 to 106 kPa (450 - 1060 mbar)

2.3 Vibration

	FREQUENCY	DISPLACEMENT AMPLITUDE PEAK	ACCELERATION
Operating	5 to 60 Hz	0.035 mm (0.0014") +/-10%	
	60 to 500 Hz		0.5 g
Storage	5 to 58 Hz	0.075 mm (0.003") +/-10%	
	58 to 500 Hz		1 g
Transport	5 to 12 Hz	3.5 mm (0.14") +/-10%	
	12 to 500 Hz		2 g

2.4 Impact

Storage : The equipment is lifted 25 mm (1") and allowed to fall freely on the bottom surface (stand not mounted).

Transport : Each face in turn lifted 600 mm (24") and allowed to fall freely.

2.5 Dust

The equipment withstands the dust of a typical office environment.

2.6 Radiated and Conducted Noise

The equipment complies with Class B in FCC Rules Part 15 Subpart J and VDE 0871.

2.7 Static Discharge

This specification refers to discharges applied to metal parts accessible with the housing mounted:

> A 150 pF capacitor is charged to 10 kV and discharged through a 150 ohm resistor using common point with equipment safety ground.

The equipment is unaffected by discharges of the specified type.

2.8 Transients in Mains Power

The equipment is unaffected by the following transients:

Between mains phases and ground (assymmetrical injection):

	a)	b)
Amplitude:	1000 V	1500 V
Risetime :	10 ns	400 ns
Duration :	100 ns	50 us

Between mains phases (symmetrical injection):

Amplitude:	750 V
Risetime :	120 ns
Duration :	50 us

2.9 Safety

The equipment conforms to VDE 0806 / IEC 380 and UL std. 478.

3. MECHANICAL DIMENSIONS AND WEIGHT

Cabinet :	Width	380 mm (15.0")
	Height	310 mm (12.2")
	Depth	362 mm (14.3")
	Weight	14.8 kg (32.6 lbs.)
Keyboard :	Width	486 mm (19.1")
	Height	30 mm (1.18") at middle row
	Depth	235 mm (9.3")
	Weight	1.9 kg (4.2 lbs.)
	Slope	6 degrees
	Keystroke	4 mm (0.16")
Stand :	Base	340 mm (13.4") diameter
	Height	130 mm (5.1") minimum to cabinet bottom
	Height	220 mm (8.7") maximum to cabinet bottom
	Tilt	10 degrees maximum forward
	Tilt	15 degrees maximum backward
	Swivel	30 degrees maximum both ways
	Weight	3.6 kg (7.9 lbs.)

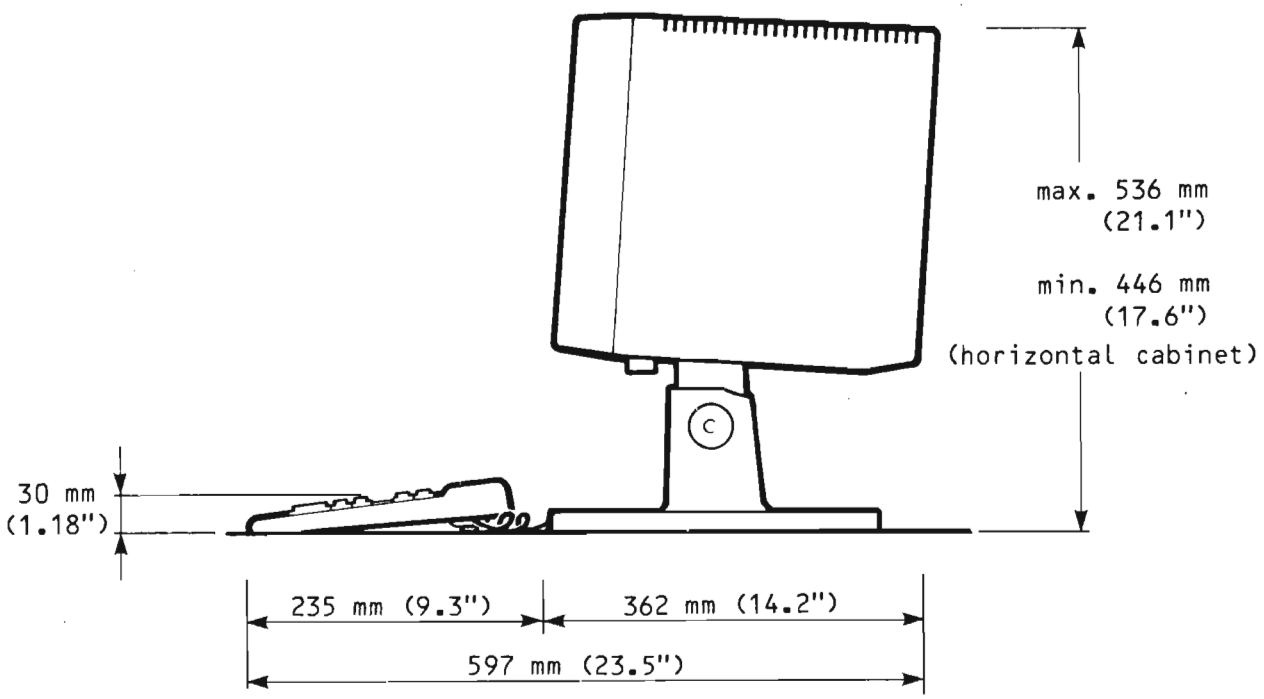


Fig. 3.1 Side view dimensions.

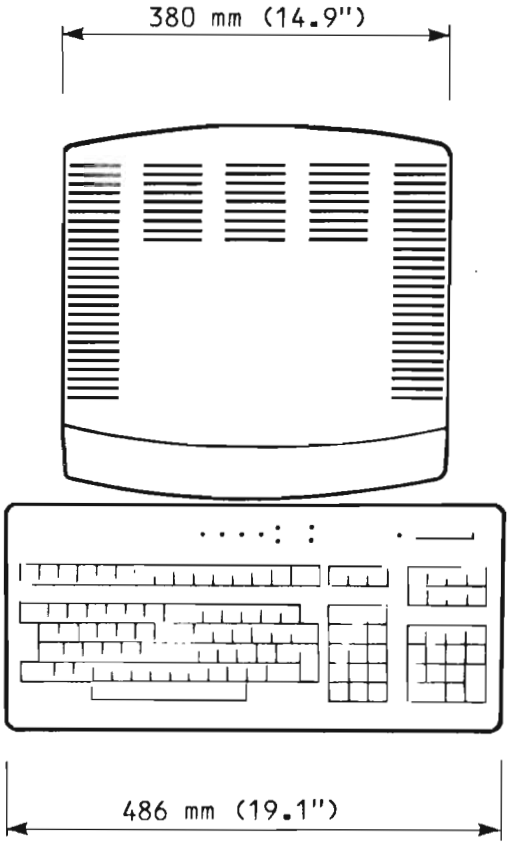
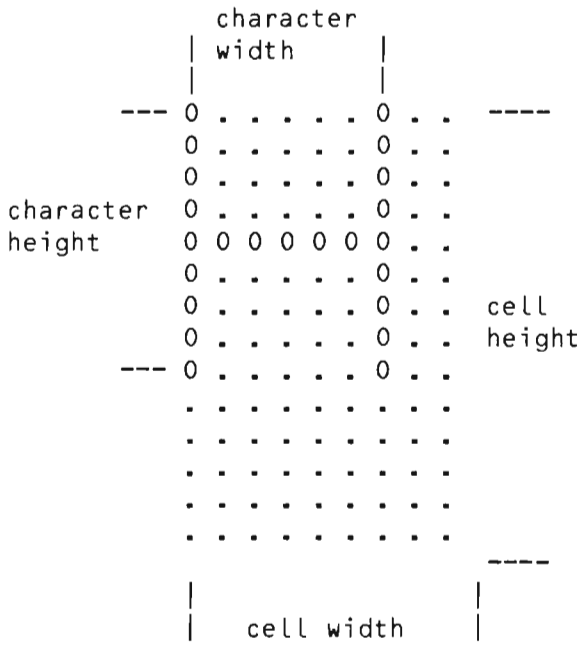


Fig. 3.2 Top view dimensions

4. SCREEN RELATED SPECIFICATIONS

4.1 Physical Dimensions

Tube size	:	15" (381 mm) diagonal
Text area height	:	195 mm (7.68") +/-2%
Text area width	:	260 mm (10.24") +/-2%



Character height	:	4.45 mm (0.175") nominal
Character width	:	2.1 mm (0.083") "
Cell height	:	7.8 mm (0.307") "
Cell width	:	3.25 mm (0.128") "
Line distance	:	3.34 mm (0.131") "
Character distance	:	1.08 mm (0.043") "

All distances are center-to-center according to DIN 66234.

4.2 Geometric Distortion

No picture element is displaced from the right position by more than 2% of text area height (3.9 mm (0.153")).

Difference between characters' size:

any characters : < 15%

adjacent characters : < 7%

Difference being defined as : $\frac{\text{max. size - min. size}}{\text{min.size}}$

4.3 Light Output

When leaving the factory, the light output will be set as follows:

	minimum	maximum
Background :	4.5 cd/sq. m	20 cd/sq. m
Low Intensity :	20 cd/sq. m	80 cd/sq. m
Normal Intensity :	40 cd/sq. m	170 cd/sq. m

All numbers have 30% tolerance and are measured at an ambient vertical light level of 4 lux. A higher ambient light level would affect the values.

Note that the light level at the maximum setting of the potentiometer is set extra high to allow for the inevitable aging of the tube.

5. INTERFACE SPECIFICATIONS

This section describes the electrical interfaces to the line and the printer.

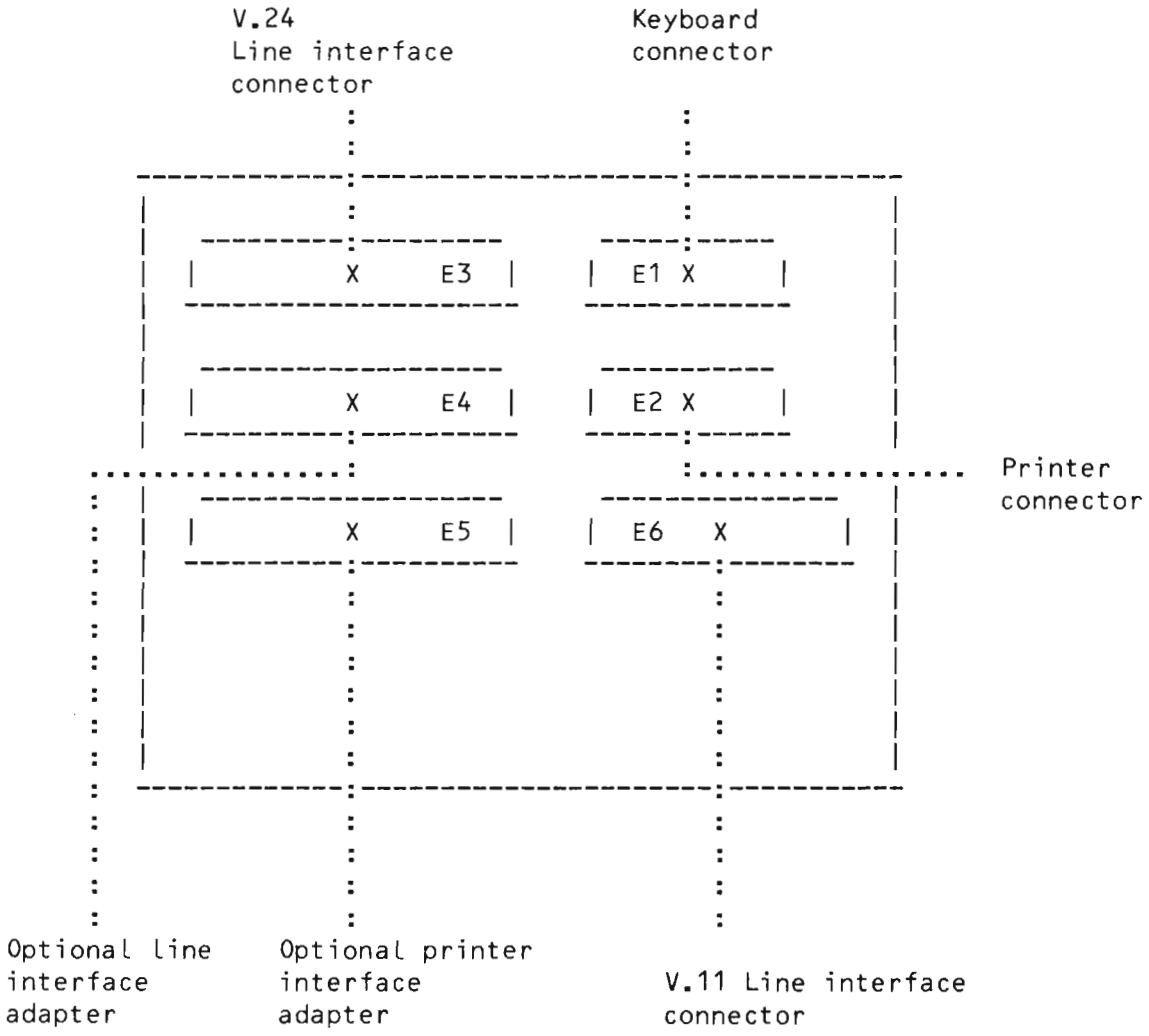


Fig. 5.1 External connections

5.1 Line Interface

Both V.24 (RS-232) and V.11 (RS-422) are provided as standard on the line interface. A current loop adapter is available as option (see section 5.4.3)

The interface logic is shared and only one commmunication line can be handled at a time.

The functional capabilities of the interface are:

	V.24	V.11	Current loop
Asynchronous	x	x	x
Isochronous	x	x	

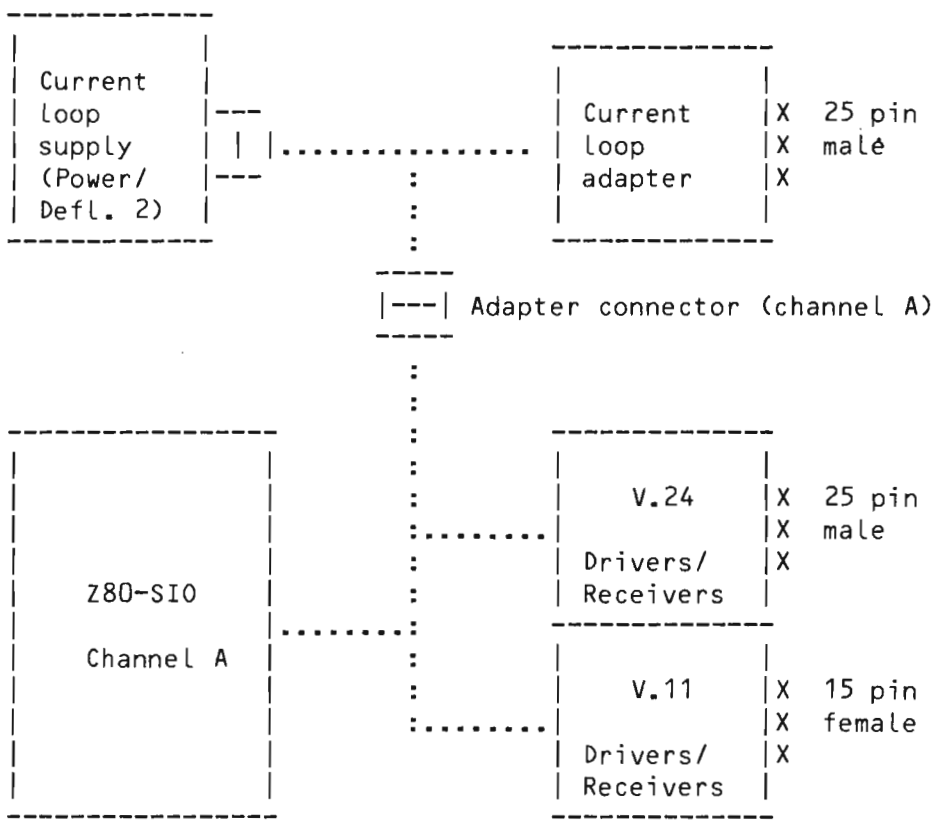


Fig. 5.2 Line interface block diagram.

5.1.1 V.24 Interface

The V.24 signals are available on a 25 pin Delta connector. The male part of the connector is mounted on the terminal.

	V.24	name	pin no.
	CT101	Protective gnd.	1
	CT103	Transmitted data	2
	CT104	Received data	3
	CT105	Request to send	4
	CT106	Clear To Send	5
	CT107	Data Set Ready	6
	CT102	Signal gnd.	7
	CT109	Carrier Detect	8
	CT114	Transmitter clock	15
	CT115	Receiver clock	17
	CT108	Data terminal ready	20
*	CT125	Calling indicator	22
*	CT111	Speed select	23
		V.24 positive level	21
		V.24 negative level	9

* Electrically connected, but not used.

See section 5.4.1 for electrical specifications.

5.1.2 V.11 Interface

The electrical levels are according to V.11 (RS-422)
The connector is according to ISO DIS 4903 and the female part of the connector is mounted on the terminal.

	X.21	name	pin no.
		Protective ground	1
	T(A)	Transmit	2
*	C(A)	Control	3
	R(A)	Receive	4
*	I(A)	Indicator	5
	S(A)	Signal element timing	6
		Not used	7
	G	Ground	8
	T(B)	Transmit	9
*	C(B)	Control	10
	R(B)	Receive	11
*	I(B)	Indicator	12
	S(B)	Signal element timing	13
		Not used	14
		Not used	15

* Electrically connected, but not used.

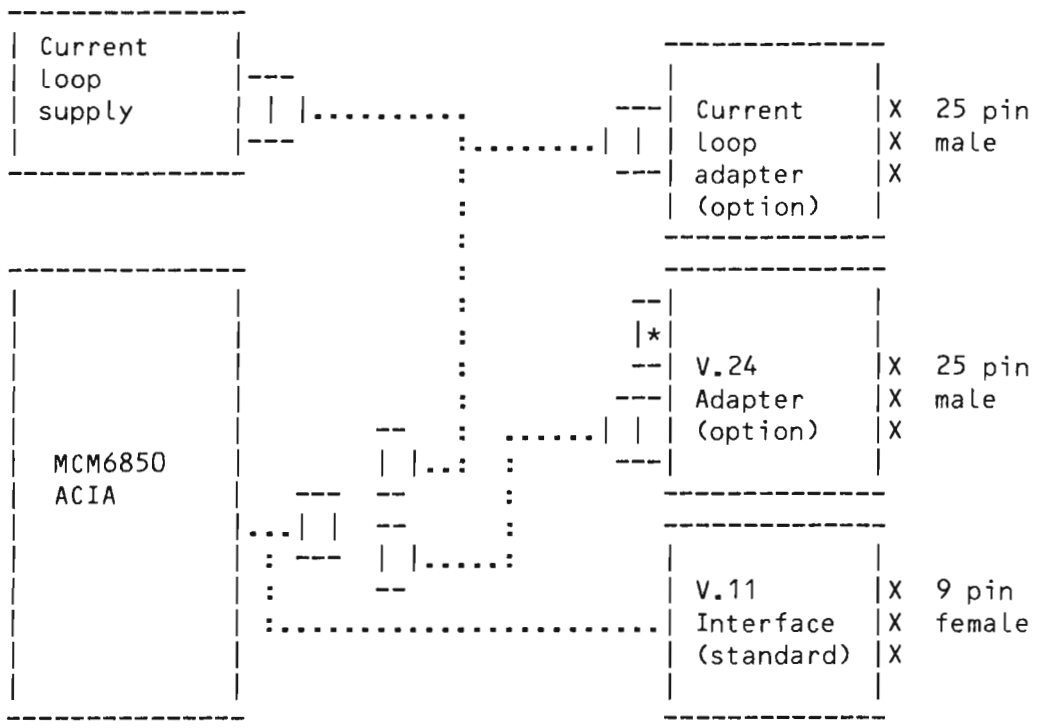
See section 5.4.3 for electrical specifications.

5.2 Printer Interface

The printer interface is an asynchronous interface with V.11 (RS-422) electrical levels as standard.

V.24 and current loop adapters are available as options. The adapters are described in section 5.3.

Control signal handling is neither possible on the V.11 nor the V.24 connections.



* The control signal connector is not used.

Fig. 5.3 Printer interface block diagram

5.2.1 Printer V.11 Interface

The connector is a 9 pin Delta with the female part mounted on the terminal.

	Signal name	pin no
	Protective ground	1
T(A)	Transmitted data (A)	2
R(A)	Received data (A)	4
G	Signal ground	6
T(B)	Transmitted data (B)	7
R(B)	Received data (B)	9

5.3 Interface Adapters

Two optional interface adapters can be present in the unit at the same time.

They occupy external connector positions E4 and/or E5 (See fig. 5.1).

The interconnection diagram below shows how the adapters are connected to Main board.
If one or both of the optional adapters are disconnected, connectors W13 and/or W14 must be strapped. For strapping information, see section 6.

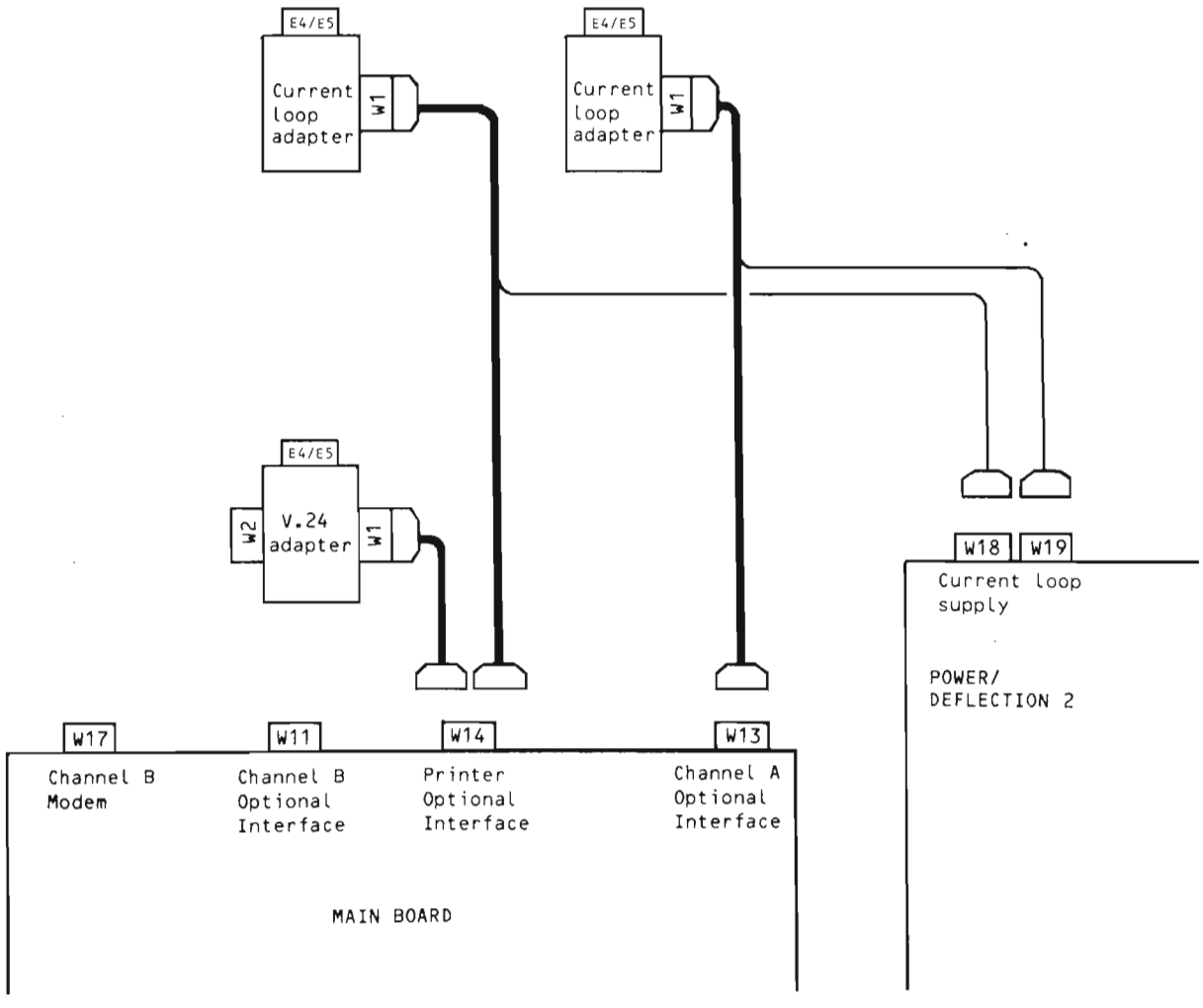


Fig. 5.4 Optional interface adapters, Interconnection Diagram

5.3.1 V.24 Adapter

The V.24 adapter consists of line drivers and receivers for data and control signals. The signals are available on a 25 pin Delta connector. The male part of the connector is mounted on the adapter.

	V.24	name	pin no.
	CT101	Protective gnd.	1
	CT103	Transmitted data	2
	CT104	Received data	3
*	CT105	Request to send	4
*	CT106	Clear To Send	5
*	CT107	Data Set Ready	6
	CT102	Signal gnd.	7
*	CT114	Transmitter clock	15
*	CT115	Receiver clock	17
*	CT108	Data terminal ready	20

* Electrically connected, but not used.

See section 5.4.1 for electrical specifications.

5.3.2 Current Loop Adapter

5.3.2.1 Current Loop Adapter Interface Signals

The current loop signals are available on a 25 pin Delta connector. The male part of the connector is mounted on the adapter.

name	pin no.
Current loop receive +	12
Current loop receive -	13
Current loop transmit +	23 and 18
Current loop transmit -	24
Transmitter current source	10
Receive current source	11
Ground floating (GNDFL)	25

pins 13 and 25 are internally connected.

5.3.2.2 Current Loop Installation Alternatives

By strapping in the plug the current loop interface can be either active (current supplied by terminal) or passive (current supplied by computer).

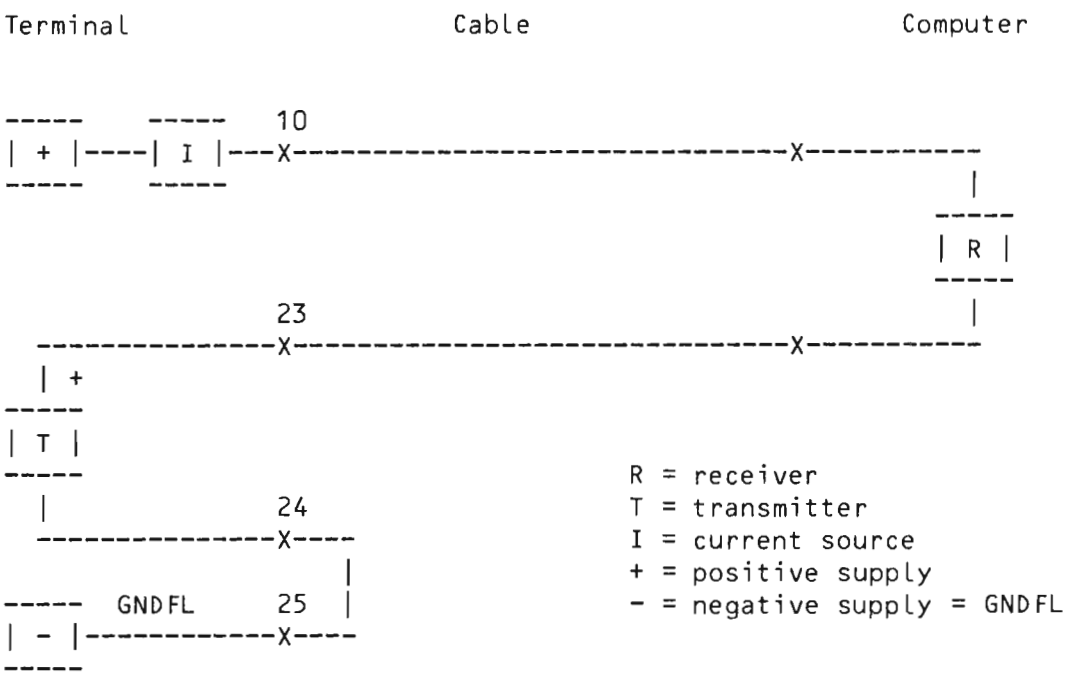


Fig. 5.5 Active transmitter section

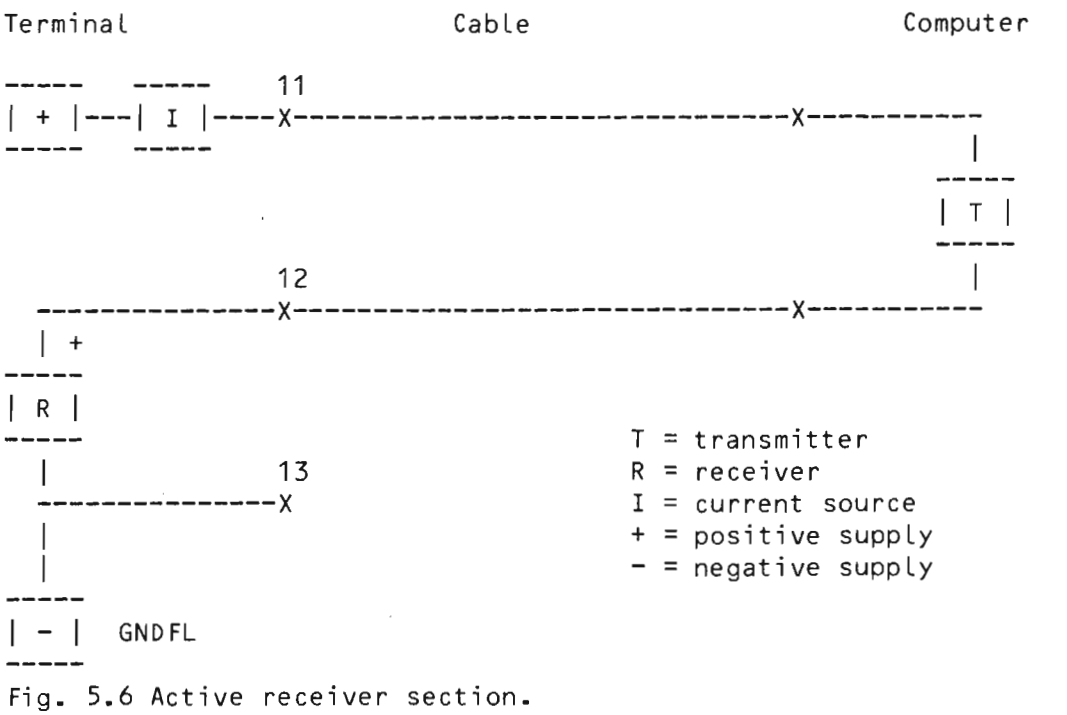


Fig. 5.6 Active receiver section.

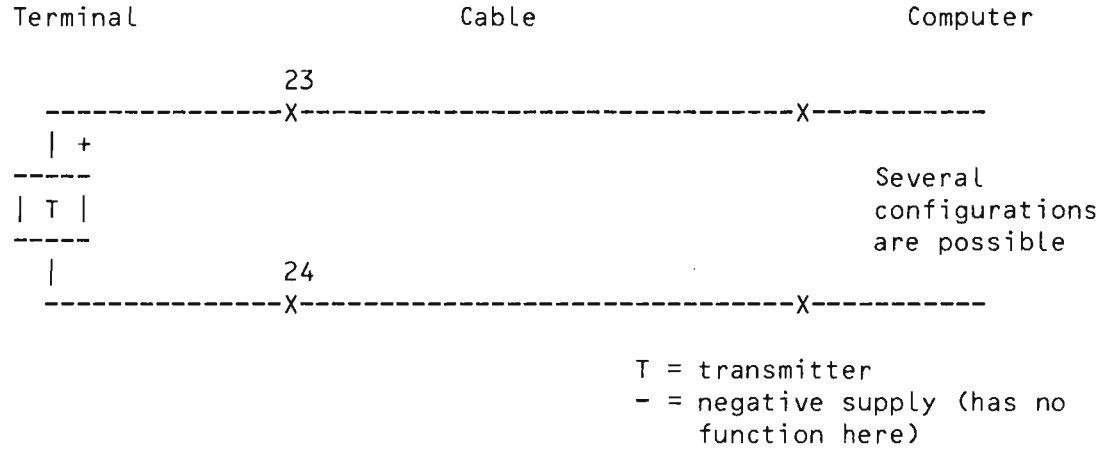


Fig. 5.7 Passive transmitter section

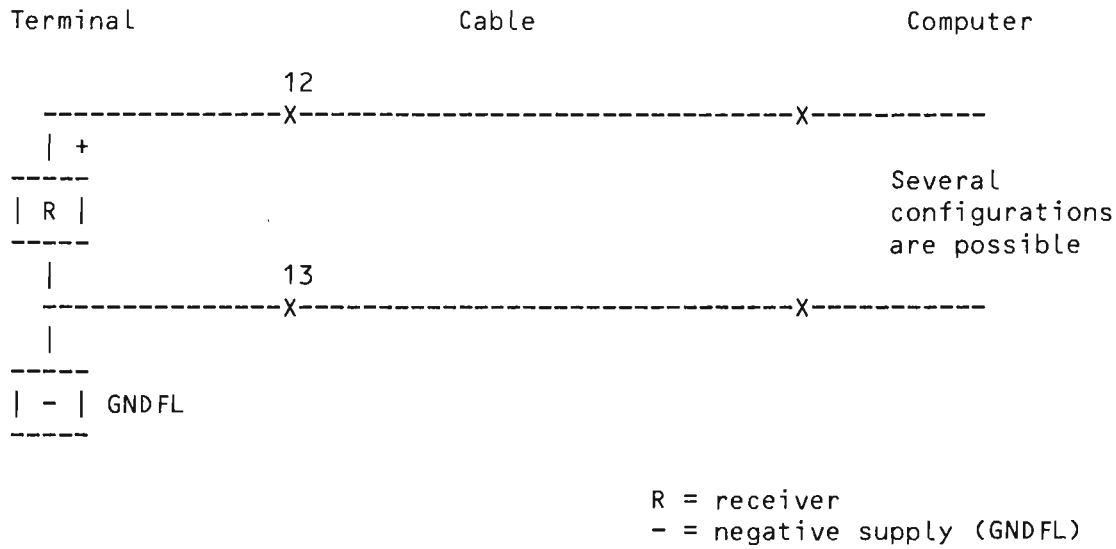


Fig. 5.8 Passive receiver section.

5.4 Electrical Specifications for Interfaces

5.4.1 V.24 Interface Electrical Specifications (V.28)

The electrical characteristics of the interface lines are according to CCITT V.28.

Receiver

Maximum ON voltage	:	25 V
Minimum ON voltage	:	3 V
Maximum OFF voltage	:	-25 V
Minimum OFF voltage	:	-3 V

Transmitter

Nominal ON voltage	:	10 V +/-10%
Nominal OFF voltage	:	-10 V +/-10%
Maximum slew rate	:	30 V/us

5.4.2 Current Loop Electrical Specifications

Internal current loop power-supply

The internal current loop power supply is floating with respect to ground and chassis.

Voltage	:	12 V +/-10%
Maximum voltage to ground and chassis	:	2000 V

Receiver characteristics

Nominal threshold current	:	10 mA
Minimum ON current	:	16 mA
Maximum ON current	:	24 mA
Maximum overshoot	:	100 mA
Minimum OFF current	:	0 mA
Maximum OFF current	:	5 mA
Maximum undershoot	:	-10 mA
Duty cycle	:	50% +/-10% (referred to 10 mA)

Transmitter characteristics

All values refer to a load of 120 ohm in parallel with 60 uF.

Nominal ON current	:	20 mA
Maximum ON current	:	24 mA
Minimum ON current	:	16 mA
Nominal OFF current	:	0.5 mA
Maximum OFF current	:	1 mA

5.4.3 V.11 (RS-422) Electrical Specifications

Receivers

Common mode range:		+/-7 V
Logical 1 on data circuits:	$V_A - V_B$	< -0.3 V
Logical 0 on data circuits:	$V_A - V_B$	> +0.3 V
ON condition on control circuits:	$V_A - V_B$	> +0.3 V
OFF condition on control circuits:	$V_A - V_B$	< -0.3 V
Cable termination:		100 ohm

Transmitters

All data refer to a load of 100 ohm.

Steady state differential voltage:	$V_A - V_B$	= +/-5 V max
DC offset :		3 V max
Logical 1 on data circuits:	$V_A - V_B$	< -2 V
Logical 0 on data circuits:	$V_A - V_B$	> +2 V
ON condition on control circuits:	$V_A - V_B$	> +2 V
OFF condition on control circuits:	$V_A - V_B$	< -2 V

Cable Type

The cable should have twisted pairs for each data and control signal pair. Screened cables should be used.

Over the length of the cable the two conductors in a pair should have essentially the same values of:

- capacitance to ground
- longitudinal resistance and inductance
- coupling to adjacent cables and circuits

Cable Length

The permissible cable length depends on the cable type employed and the difference in ground potential between the two ends of a communication link.

Normally cable lengths up to 1000 meters can be used at the speeds in question (19200 baud).

6. DISCONNECTED ADAPTERS - STRAPPING INFORMATION

The Mainboard connectors W13 and/or W14 must be strapped if one or both of the optional interface adapters are disconnected from Mainboard.

Connectors W13 and W14 are located on the left hand side of Mainboard. See fig. 6.1 below.

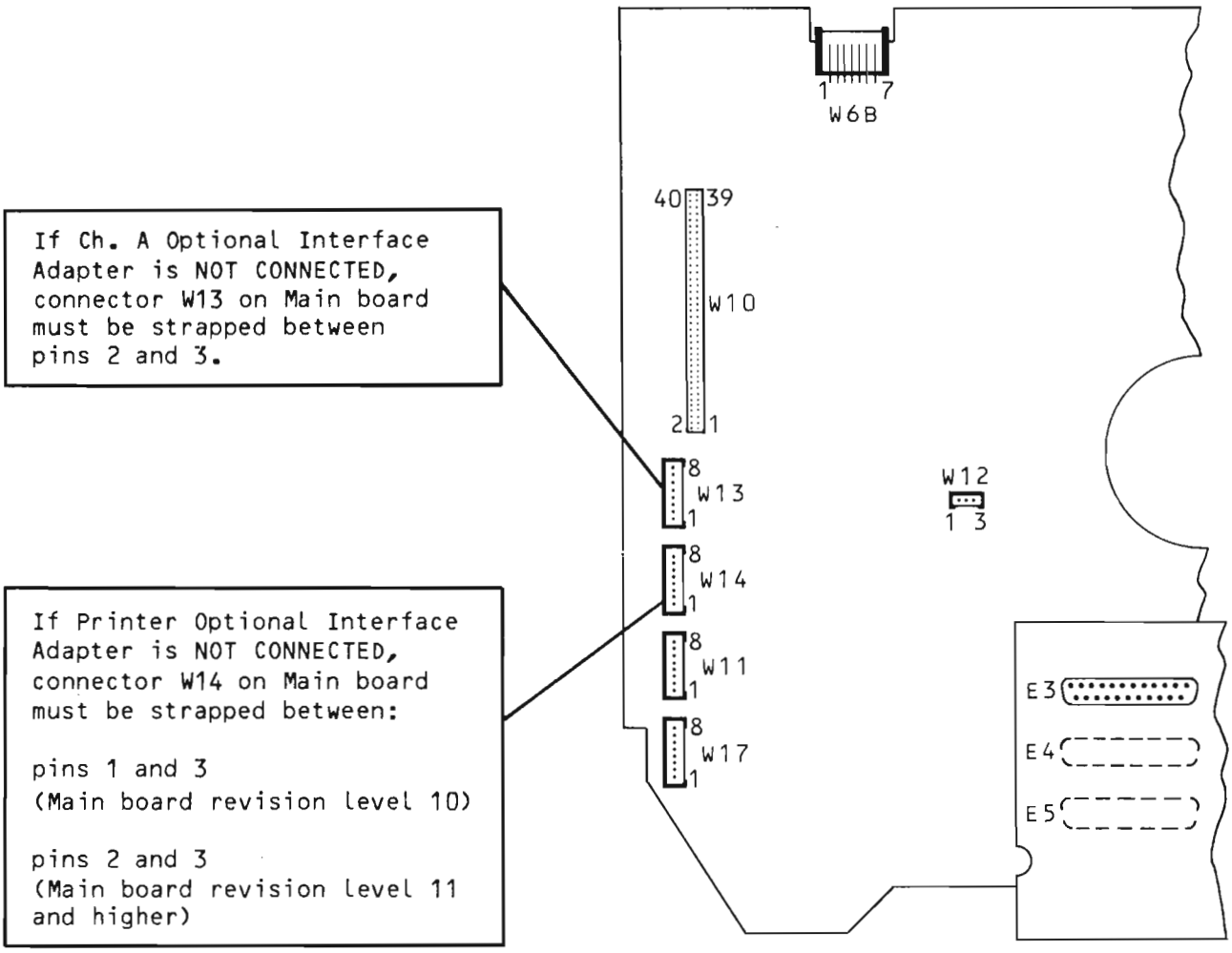


Fig. 6.1 Location and pin numbering of Main board connectors W13 and W14