L1

M54-M64-M70

Site Preparation Guide

olivetti

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Information from
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INTRODUCTION - GUIDE TO USING THE MANUAL

This manual contains the information needed to prepare the location for installing an NL1 system with its associated peripherals.

This information is useful to:

- ATC technicians
- Sales representatives
- Customers.

The following chapters deal with the characteristics of the mains distribution network, the environmental conditions, the working area and the system ventilation. They also provide detailed instructions for the correct installation of the machines for operation by the end users.

Other chapters contain the system characteristics and those of the cabling, the modules and the peripherals.

SUMMARY

Chapters 1 to 4 deal with the mains network characteristics, the physical environment, the working area and the ventilation (information needed for the correct installation of the system).

Chapter 5 provides the system characteristics and those of the cabling and the peripherals.

Chapter 6 describes the various ways of arranging the work stations.

Chapter 7 explains the line connections.

REFERENCES: None.

DISTRIBUTION: General (G).

INDEX

1. INTRODUCTION

To achieve correct operation of the system, the user must ensure the correct installation of the following:

- The principal mains distribution network, which must conform to the required safety standards and be capable of supplying the current needed for the units in the system (see the "Power Supply Characteristics" paragraph on page 5-2).

- Interconnection lines (where necessary) between the BOX, the CABINET and the WORK STATIONS (see the "Work Stations" paragraph on page 6-1).

It is also necessary that he provide:

- An adequate servicing area in the region of the system units (see the "Operational Area and Ventilation" paragraph on page 4-1).

- The correct temperature of the location, which must conform to the conditions specified under the heading "Environmental Conditions" (see the "Temperature and Atmospheric Humidity" paragraph on page 3-1).

- A ventilation sufficient for the cooling of the units (see the "Operating Area and Ventilation paragraph" on page 4-1).

2. MAIN POWER SUPPLY CHARACTERISTICS

2.1 A.C. POWER SUPPLY

The electrical installation must conform to the specifications described in the following chapters and must be capable of supplying all the units installed.

2.2 MAINS NETWORK

Cables and switches must be of adequate dimensions for carrying the working load and the current peaks at the moment of switching on the system. The maximum variations of voltage, current and frequency for each module in the system are listed in the "System Characteristics" paragraph on page 5-1.

2.3 GROUND (earth)

The resistance to ground of the grounding installation must correspond to the requirements of the NATIONAL STANDARDS.
A value of 50 ohms is sufficient for protection from interference. However, the Italian ENPI standard requires less than 20 ohms for protection of operating personnel.

NOTE: The importance of a good ground connection in an electrical installation cannot be over-emphasized. An ungrounded system will never operate correctly and includes a definite safety risk.

Using a circuit without a ground connection, the following types of situation can arise:

- Electrical shocks on touching any metal parts.
- Intermittent machine failures.
- Errors in program execution.
- Magnetic supports which cannot be recorded.
- Expensive damage to equipment.

2.4 ELECTRICAL INTERFERENCE

The system must be isolated from sources of electrical interference and from all equipment which could cause excessive variations in the voltage level or introduce large inductive or capacitive loads into the circuit.

For example, it is necessary to avoid connection of the following devices to the same mains distribution network as the system:

- Air conditionaers, large ventilation systems, or similar.

- Alternators or large transformers.

- Large motors, brush or induction, such as those used for elevators.

- Radio and/or television transmitters, signal generators and security systems operating at high frequencies.

- The maximum levels of interference conducted by the mains network which the system can accept are:

. Amplitude	500 V
. Rise time	40 ns
. Decay time	500 us
. Maximum fundamental frequency	100 Hz

2.5 MAINS FAILURES

The system can support the following degrees of failure of the 50/60 Hz mains supply:

- Minus 15%

- Minus 30% for a maximum of 25 cycles

- Total failure for a half cycle (10 ms).

Beyond these values, there is a system reset.

NOTE: Some small office machines (typewriters, small copiers, calculators, etc.) are allowed as loads on the same mains line as the system since they do not provoke excessive interference. It it thus possible to connect the NL1 system to the same network so long as each machine is connected to its own specific outlet.

3. ENVIRONMENTAL CONDITIONS

The main factors influencing operation of the NL1 system are:

- Temperature and relative humidity
- Dust levels
- Altitude (disk units).

The temperature and relative humidity values can be measured with normal thermo-hygrometer recorders available on the open market.
The dust levels and thus the atmospheric composition cannot be measured with normal equipment but, in cases of need, their measurement can be commissioned from specialised institutes.

3.1 TEMPERATURE AND ATMOSPHERIC HUMIDITY

The ranges of environmental conditions relating to temperature and humidity in which the specified performances of the system are guaranteed are indicated in the following diagram (Figure 3-1).

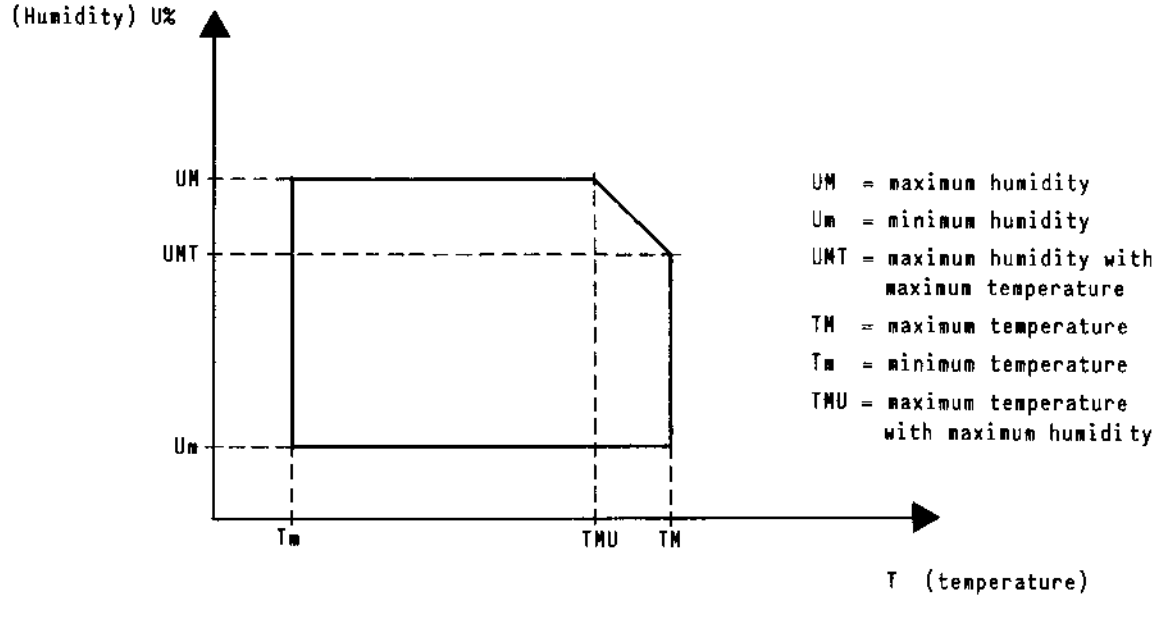


Figure 3-1 - Operating conditions

As can be seen from the diagram, during operation, a combination of maximum temperature and maximum relative humidity is not permitted. The TMU and UMT maxima are respectively:

- TMU = 0.9 TM
- UMT = 0.9 UM

Exceeding these maximum allowable limits during operation can cause random system errors and there can be an excessive deposit of oxides from the magnetic supports on the heads, causing rapid wear of the support and of the heads themselves.

NOTE: The limiting values of temperature and humidity refer to the operating environment in the immediate vicinity of the machine.

Table 3-1 below lists the extreme values of temperature and humidity for the NL1 system during operation, when switched off and in storage. (The minimum and maximum values for any NL1 system are determined by the magnetic peripherals used.)

It should be noted that the "operating condition" temperature reflects on the mortality rate of the electronic components. A well ventilated system which operates at temperatures below the maximum offers a greater reliability.

NL1 MODULES		OPERATING CONDITIONS		SWITCHED OFF CONDITIONS		STORAGE CONDITIONS	
		Temp. °C	r.h. %	Temp. °C	r.h. %	Temp. °C	r.h. %
M54 / M64 / M70 without magnetic supports		10 - 40	10 - 95	5 - 50	5 - 95	-15 - +55	5 - 95
MAGNETIC SUPPORTS	MFDU & FDU	10 - 40	20 - 80	5 - 50	8 - 80	-30 - +55	8 - 90
	HDU	10 - 40	8 - 80	5 - 50	5 - 95	-34 - +55	5 - 95
	STC	10 - 40	30 - 80	5 - 50	5 - 90	-30 - +55	5 - 95
	MTU	10 - 32.8	15 - 95	5 - 50	10 - 90	-30 - +50	10 - 90
	BADGE	10 - 40	10 - 90	5 - 50	5 - 95	-35 - +55	5 - 95

Table 3-1

NOTE: The magnetic supports should be acclimatised in the operating environment before use. Normally, an hour is sufficient.

ALTITUDES SUPPORTABLE BY THE DISK UNITS

OPERATING CONDITIONS	NON-OPERATING CONDITIONS
-300 to +3000 m	-300 to +10 000 m

NOTE: For more detailed information on the peripherals, refer to Chapter 5.6.

3.1.1 DUST LEVELS

The NL1 system can be installed in a normal office and the maximum dust level permitted by Olivetti standards is 0.25 mg/m^3. This value covers the greater part of office environments.

A high dust level is particularly damaging to the magnetic peripheral units, since the heads may be damaged and it can obstruct the channels for the cooling air.

3.1.2 IONISED RADIATION FROM THE CRT

The radiation is less than 0.1 mR/h at a distance of 10 cm, which is much less tan required by the CEE standard 80/836 (0.5 mR/h).

3.1.3 STATIC ELECTRICITY

A very low humidity level can provoke the generation of electrostatic charges which interfere with the read/write operations on the magnetic supports.

Other causes of electrostatic charges are carpets and rugs.

All the modules in the system conform to the standards relating to electrostatic charges. The immunity value to these for the NL1 system is 10 KW, measured with a Schaffner NSG 430.

A few approaches to reducing the static electricity are:

- Hold the humidity near to the maximum permitted level.

- Use antistatic carpets and rugs etc.

- Use antistatic liquids regularly (see the BIG coded 999.72.2 G 01 for the treatment of carpeted floors).

4. OPERATING AREA AND VENTILATION

To ensure that all the parts of the machine are accessible to the servicing technician, a service area around the system must also be provided when taking account of the air flow necessary for good ventilation.

The following examples will be a great help when planning the layout of the room.

4.1 NL1 - M54 (BOX)

In view of its dimensions, the BOX can be placed in almost any position, but the following rules must be taken into account:

- Avoid installing the BOX inverted or with the MFDU toward the top or bottom (i.e. so that the disks are inserted vertically).
- Leave sufficient space near the BOX for the cables.
- Avoid installing the BOX too near floor level to prevent the arrival of an excessive amount of dust (25 cm minimum distance).
- Allow for the easy withdrawal of the BOX (essential for service technicians).
- Do not obstruct the grills for input and output of cooling air for the BOX to ensure good ventilation.

4.2 NL1 - M64 / M70 (CABINET)

When selecting a location for installing the CABINET version, the same suggestions as for the L1 - M54 BOX should be followed.

NOTE: Before moving the M64 / M70 CABINET, ask for help from the Service Organisation.

The following drawings show the dimensions and the air flow in the M54 system.

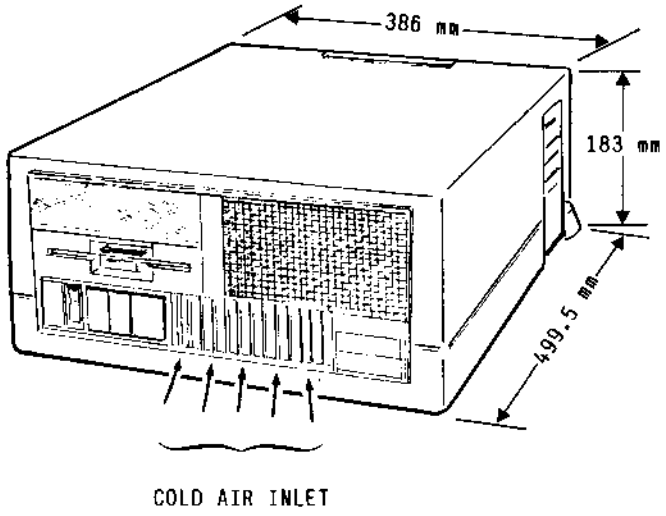


Figure 4-1 - NL1 - M54 (Front panel) Air flow and dimensions

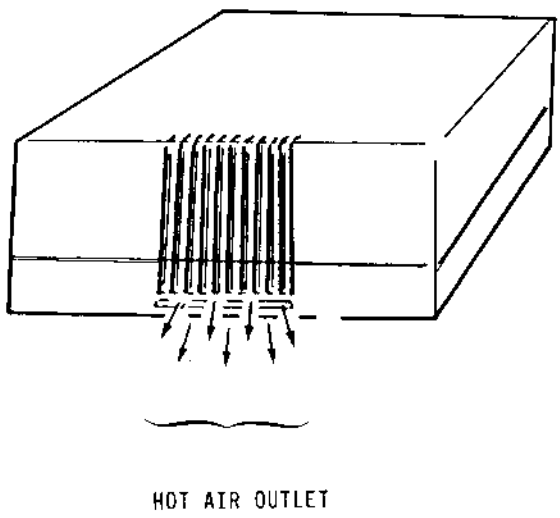


Figure 4-2 - M54 (rear view)

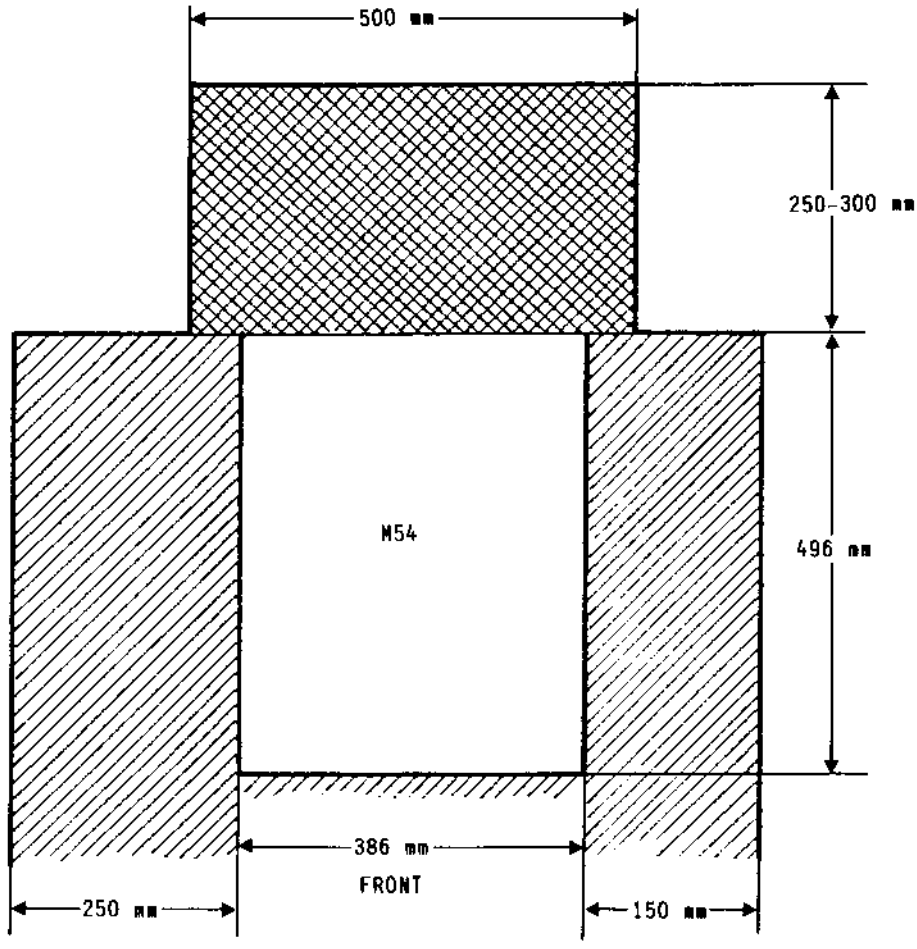


Figure 4-3 - NL1 - M54 (top view) Area needed to provide correct ventilaton and servicing for a desk top installation

Servicing area

Ventilation area

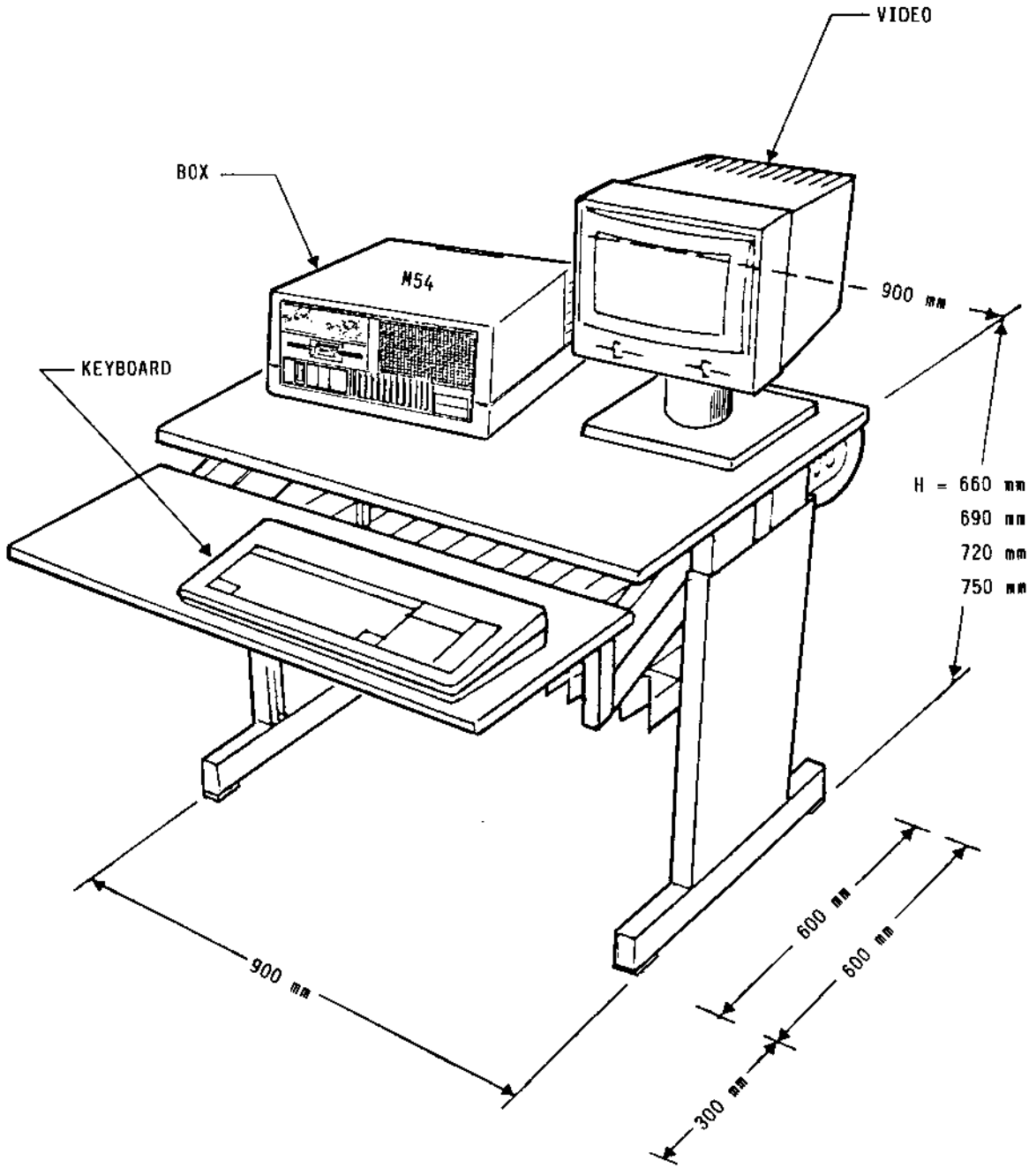


Figure 4-4 - M54 with keyboard and video
on adjustable height table

The a.c. supply for the video is obtained from the BOX so that, for this configuration, only one mains outlet is needed. The mains cable for the BOX is 2.5 meters long.

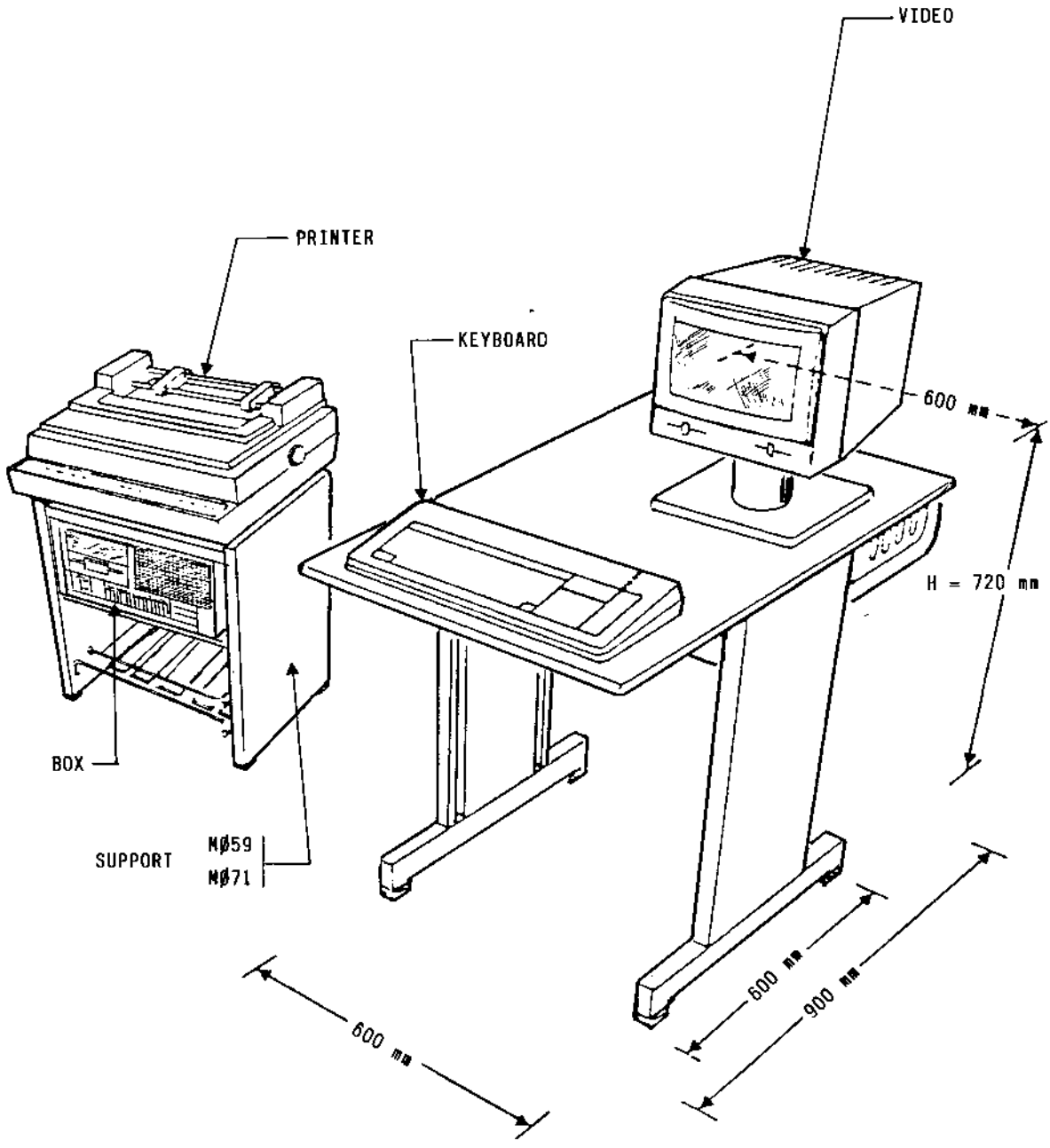


Figure 4-5 - M54 with M059 or M071 support plus the video and keyboard on a table

NOTE: It is important to leave space for withdrawing the BOX for servicing.

The M059 and M071 modules are normally also used to support the printer.

The a.c. supply to the printer is separate from that for the system.

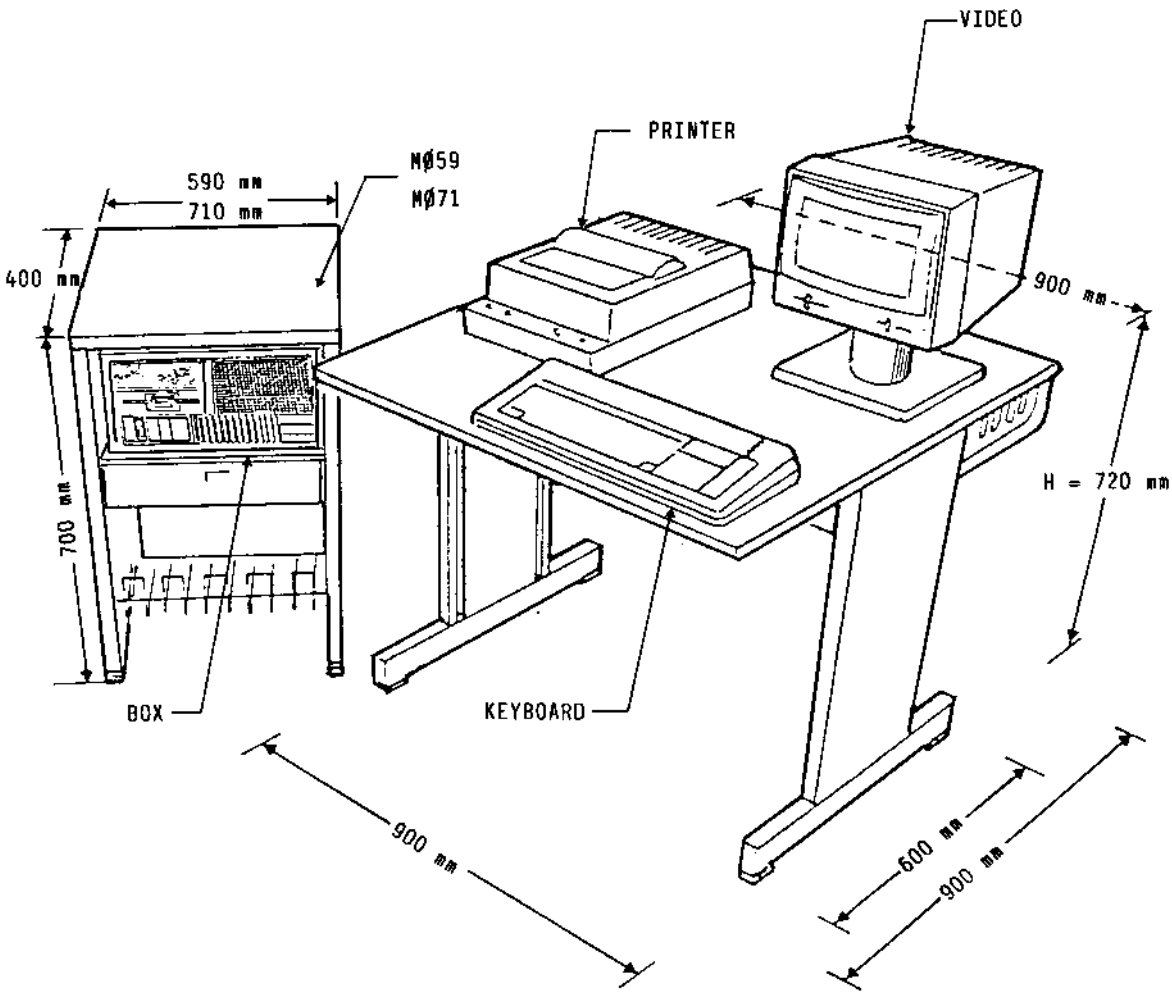


Figure 4-6 - M54 with M059 or M071 support, plus the keyboard, video and printer on the table

NOTE: It is important to leave space for withdrawal of the BOX for servicing.

The a.c. supply for the printer is separate from that for the system.

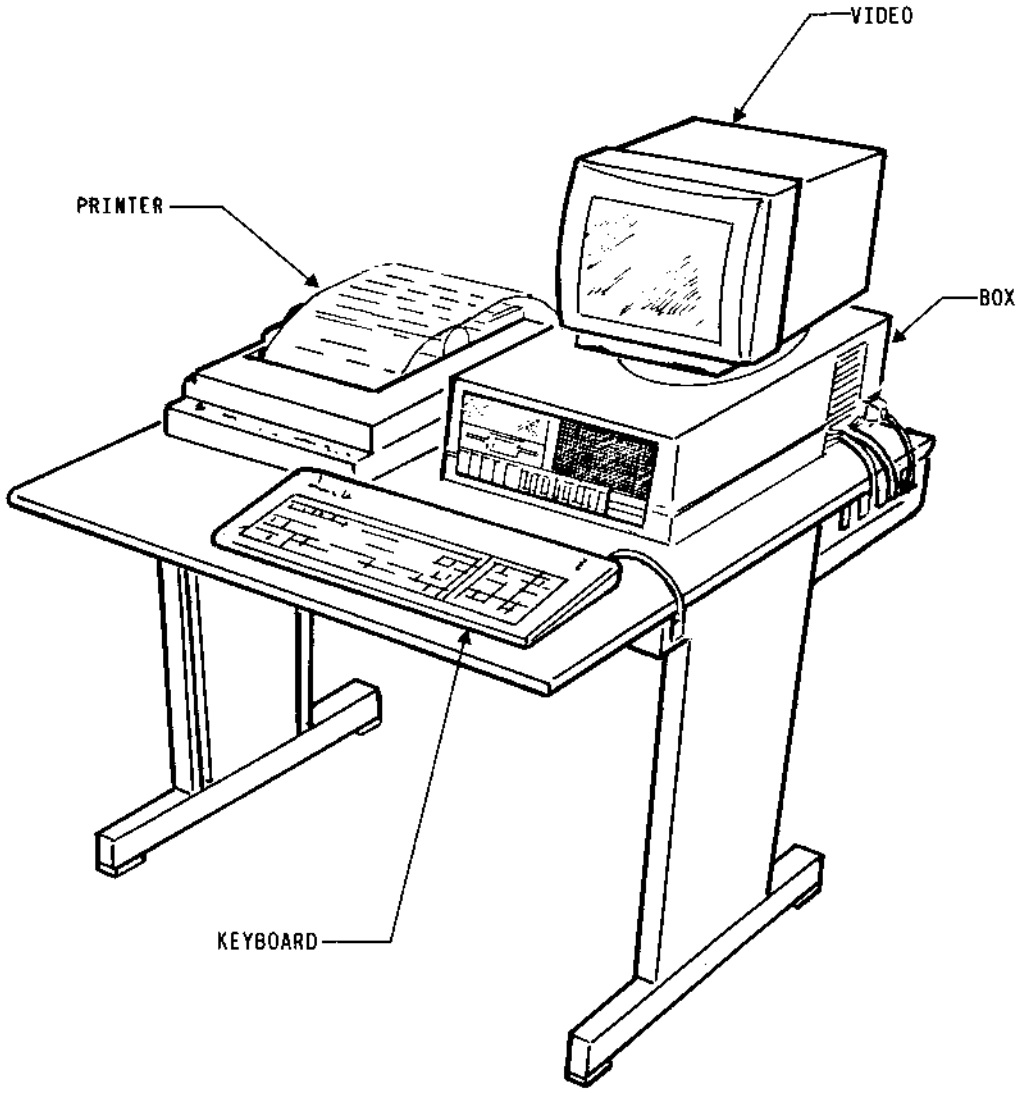


Figure 4-7 - M54 configuration with video placed on BOX.
NL1 - M54 in the BOX itself.

If the air inlet is situated near the floor (less that 25 cm) it is recommended to draw the air from a higher zone via a collection tube.

The M54 BOX must be easily removable for servicing.

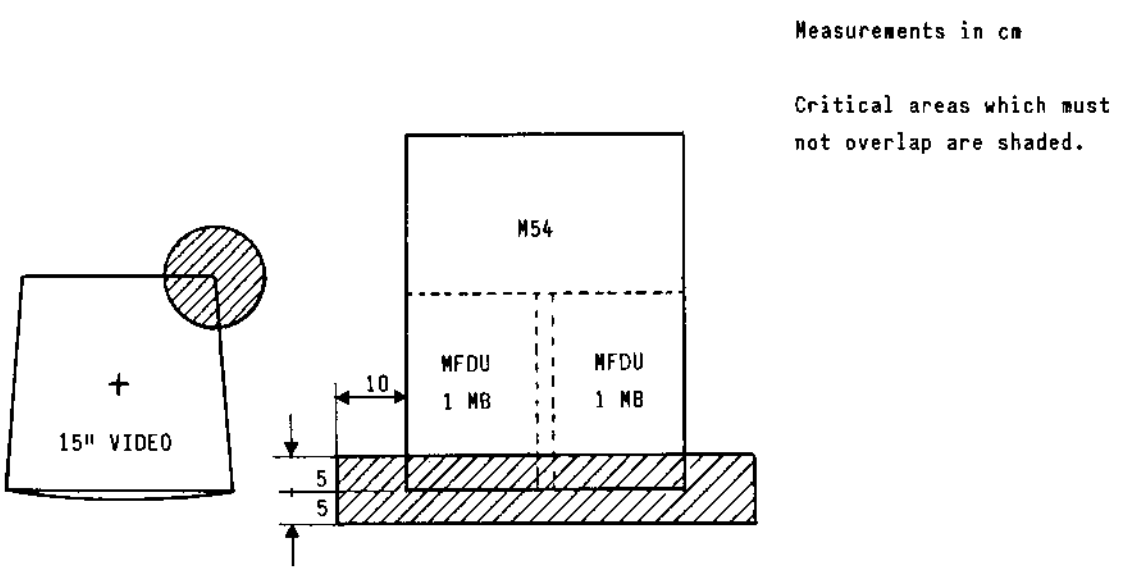


Figure 4-8 - NL1 - M54 configuration with 15 in. video and a BOX containing a 1 MB MFDU

This configuration requires careful attention due to the possible electromagnetic interference from the 15 in. video in the 1 MB MFDU.

In Figure 4-8, it should be noted that:

- The area inside the dotted lines is the source of interference.

- The hatched rectangle is the area sensitive to the interference.

The example is valid for the M54 if there is a 1 MB MFDU.

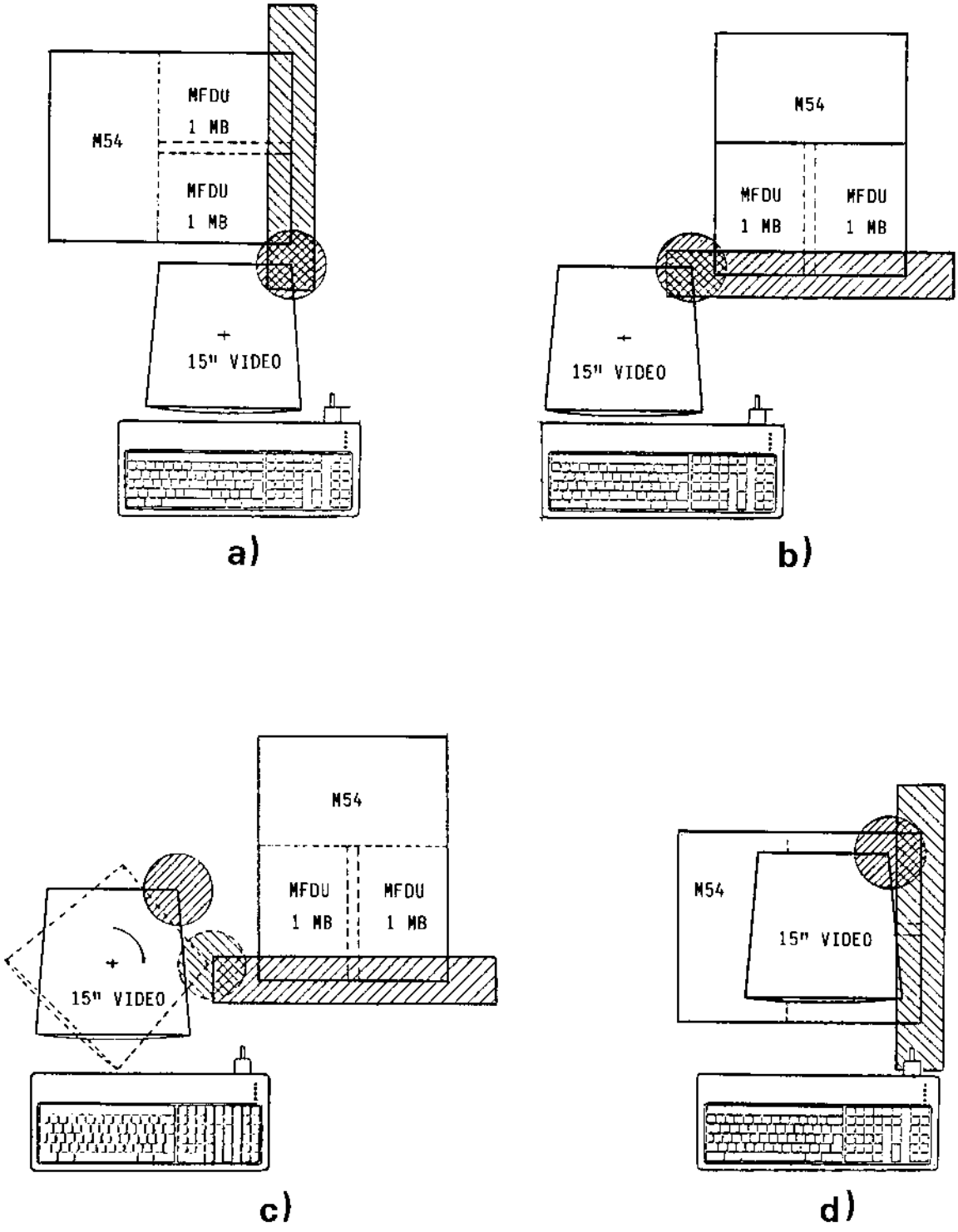


Figure 4-9

- Configurations A, B, C and D can <u>not</u> be achieved.

DIMENSIONS:

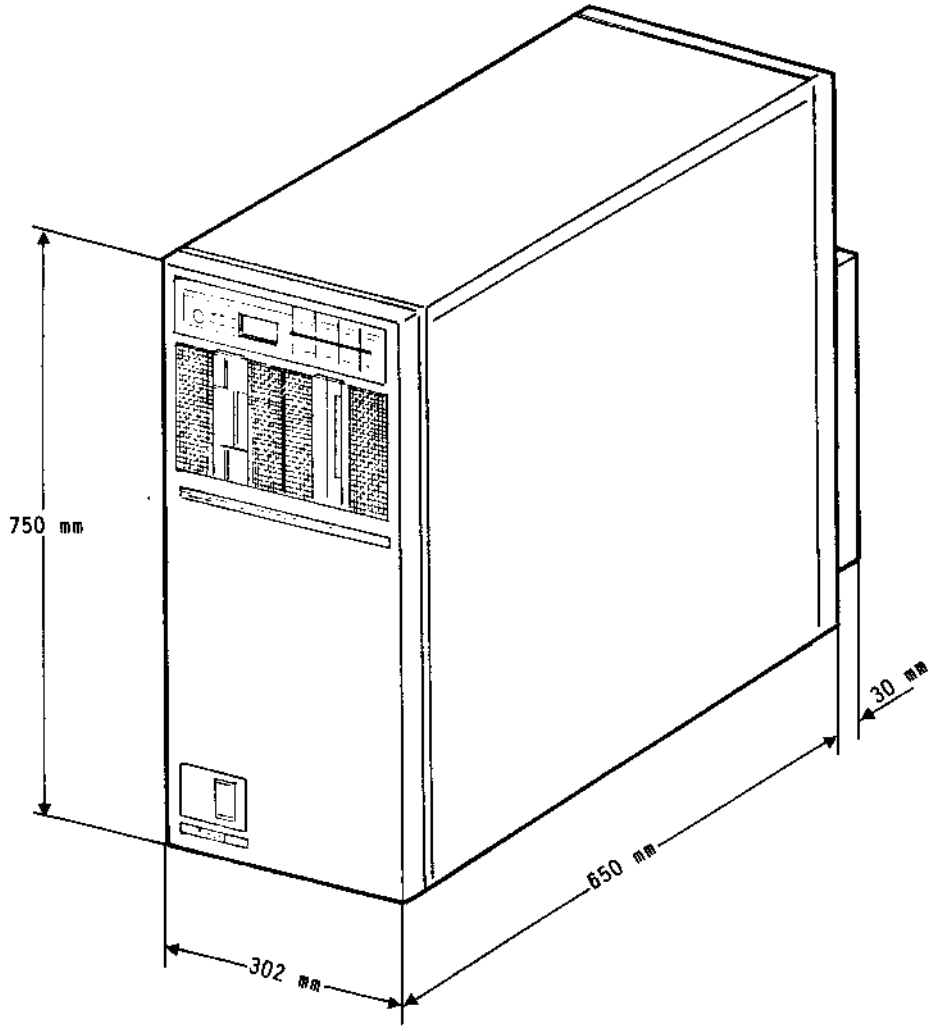


Figure 4-10 - NL1 - Example of system configuration

Cable length: 2.5 m

See Figure 4-13 for the service area.

DIMENSIONS:

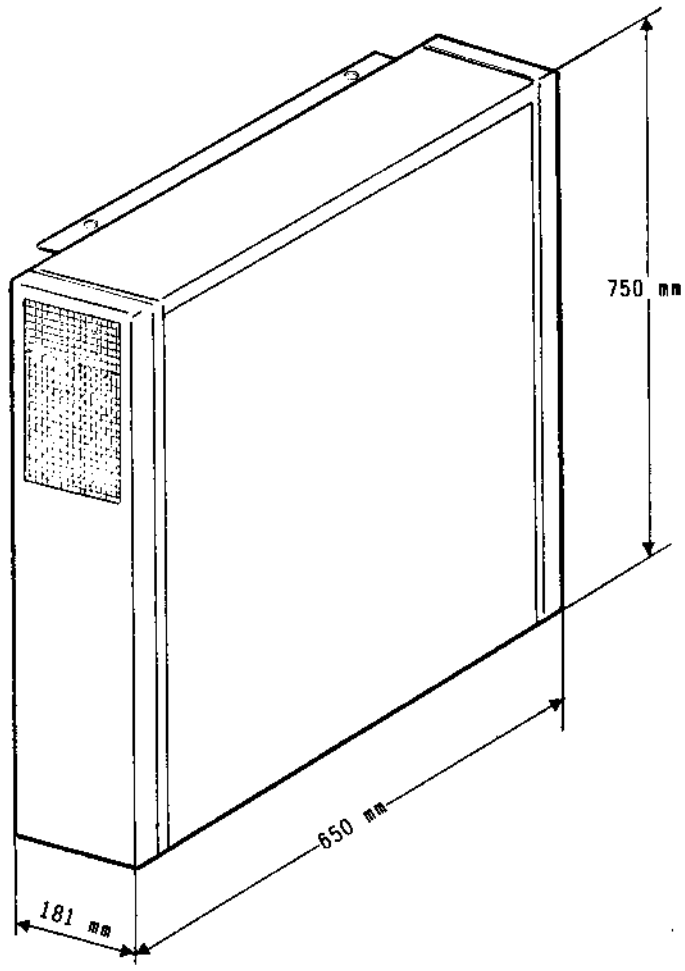


Figure 4-11 - NL1 - SB1 system expansion

Cable length: 2.5 m

See Figure 4-13 for the service area.

DIMENSIONS:

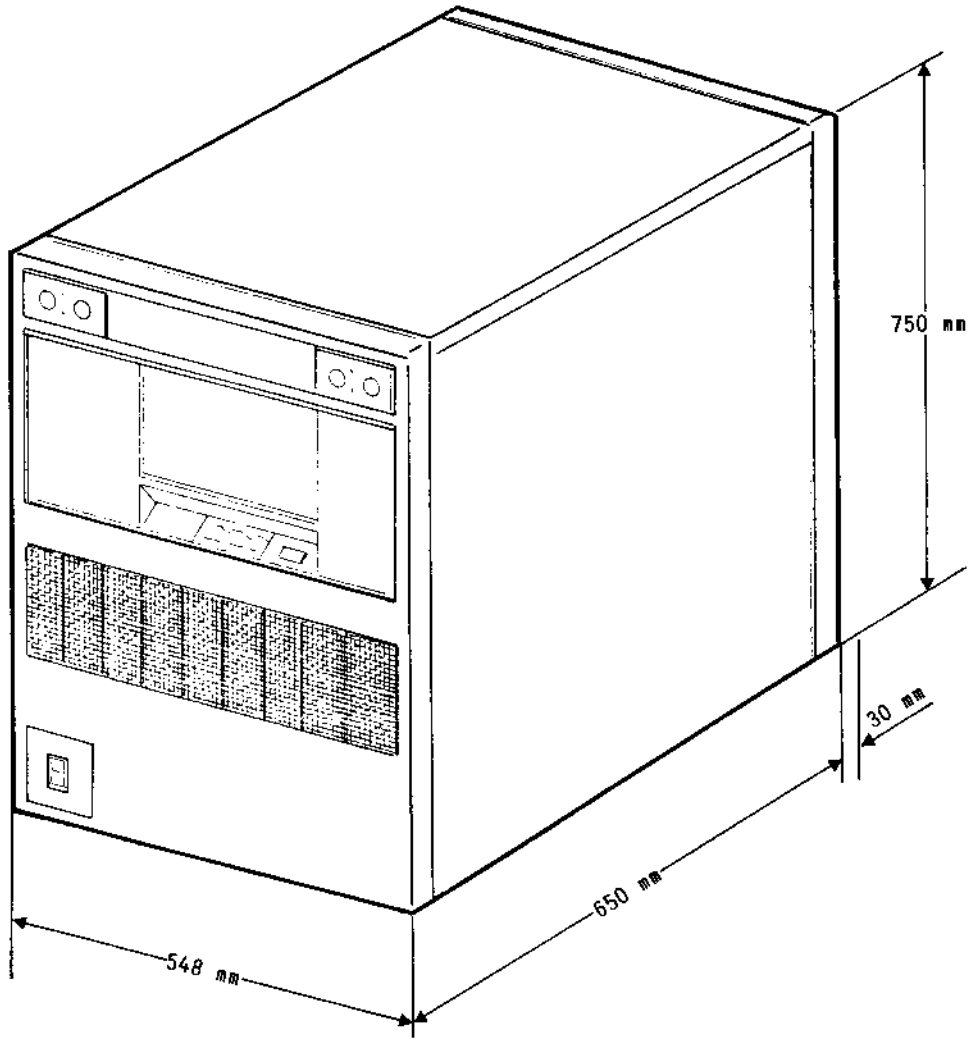


Figure 4-12 - NL1 - SB2 system expansion

Cable length: 2.5 m

See Figure 4-13 for the service area.

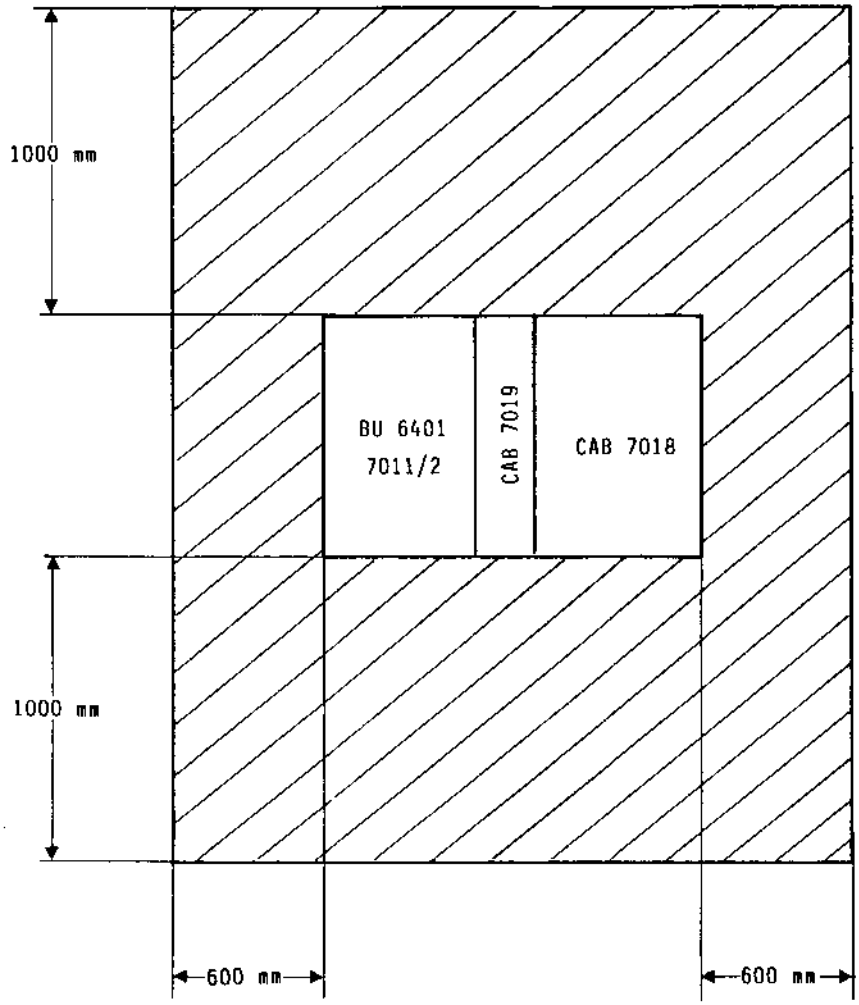


Figure 4-13 - Service area: an example of configuration with an M64/M70 basic unit and CAB 7019 + CAB 7018

NOTE: For the a.c. supply to this system, three mains outlets must be provided.

5. SYSTEM CHARACTERISTICS

5.1 ELECTRICAL CHARACTERISTICS

Voltage and frequency:

FREQUENCY	VOLTAGE				
	110	115	120	220	240
50 Hz	*		*	*	*
60 Hz	*	*		*	

Voltage variation ±10%
Frequency variations ± 2%

Total mains failure accepted for less than a half cycle (10 ms).

When the mains supply falls outside the above tolerances, it is necessary to use a stabiliser, the power capacity of which must be equal to the maximum power absorbed by the system:

Resonant core type or saturated core type | with a power capacity equal to the configuration requirements.

Normal output voltage tolerance guaranteed by suppliers: ±2%

Output impedance: ≤4 ohm

Harmonic distortion: ≤5%

Cos φ: 1 to 0.85 advance.

To avoid the effects of voltage failures on the system, when it is necessary to safeguard the integrity of data and work, it is suggested to use static standby assemblies to meet the power requirements of the systems concerned. These are to be obtained on the local market.

5.2 POWER SUPPLY CHARACTERISTICS

TYPE OF POWER SUPPLY	POWER (W)	POWER DRAIN (A)				NOTES
		+5 V	+12 V	-12 V	+35 V	
LA17	170	25.5	4.3	0.7		
LB40	350	40	1.4	1.4	4.1	
LB12	125	25 *				
DCA 36/5/12	35.3	1.3	2.4			Connected on the peripherals
DCA 36/5/24	35.3	1.3	2.4			Connected on the peripherals

* In parallel with the +5V from the LB40. The parallel connection is via the Back Plane.

5.3 D.C. CURRENT AND POWER FOR ELECTRONIC MODULES

MODULE DESCRIPTION	P.d.G. REFERENCE NAME	CURRENT DRAIN (A)			POWER (W)	SYSTEMS CONCERNED (1)
		+5 V	+12 V	-12 V		
UC070 CENTRAL UNIT	BU6041	3.7	0.023	0.018	19	M54/64
UC071 CENTRAL UNIT	BU7011/12	5.8	0.023	0.018	29.5	M70
TCB TIMING CONTROL	BU7011/12	3.5			17.5	M70
RA57/E 512 KB MEMORY	MEM 3374	1.85 1.38			9.25 6.9	M54/64
RA57/C 1MB MEMORY	MEM 3361	1.72 1.18			8.6 5.9	M54/64
RA57/B 1.5MB MEMORY	MEM 3362	1.86 1.33			9.3 6.65	M54/64
RA57/A 2MB MEMORY	MEM 3363	1.99 1.46			9.95 7.3	M54/64
RA65/B 1MB MEMORY + ECC	MEM 7022	2 0.7			10 3.5	M54/64
RA65 2MB MEMORY + ECC	MEM 7024	3 1.2			15 6	M54/64
RA80/B 2MB MEMORY + ECC	MEM 6032	2.5 1.4			12.5 7	M70
RA80/N 4MB MEMORY + ECC	MEM 6034	3.3 2			16.5 10	M70

(1) Where no system is specified, the module concerned is valid for all NL1 systems.

MODULE DESCRIPTION		P.d.G. REFERENCE NAME	CURRENT DRAIN (A)			POWER (W)	SYSTEMS CONCERNED (1)
			+5 V	+12 V	-12 V		
HDU CTLR. (SMD3)	GO 301/A GO 302/A	HDC 3527	6.1		0.55	37.1	M64/70
HDU CTLR. (SMD4)	GO 301/B GO 302/A	HDC 7075	6.1		0.55	37.1	M64/70
HDU CTLR. (ST506)	GO 363	HDC 3544	3.3			16.5	
HDU CTLR. (ESDI)	GO 404 GO 405	HDC 7050	5.2			26	
STC CTLR. (slim)	GO 417 GO 418	STS 7037	5			25	
STC CTLR.	GO 200/B GO 342	STS 6420	4.36			21.5	M64/70
MTU CTLR.	GO 278/B	MTC 3543	2.85			14.25	M64/70
320 KB MFDU CONTROLLER	GO 280/C-E	FDC 3534	2.5	0.15		12.77	M54
1 MB MFDU CONTROLLER	GO 280/B-D	FDC 3593	2.5	0.15		12.77	
V24 LINE CONTROLLER	GO 300	LCU 3376	1.8	0.6	0.6	23.4	M54/64
LION 9.6 LINE CTLR.	GO 234	LCU 3397	2.2			11	M54/64
X21 LINE CONTROLLER	GO 303	LCU 3326	1.86			9.3	M54/64
V24 + LION 200 CTLR.	GO 256	LPU 3390	2.79	0.17	0.05	16.6	

MODULE DESCRIPTION	P.d.G. REFERENCE NAME	CURRENT DRAIN (A)			POWER (W)	SYSTEMS CONCERNED (1)
		+5 V	+12 V	-12 V		
MOIN 5.2. IF 192 INT. MODEM	LTU 3395	0.6	0.25	0.25	9	
OMNINET GO 308 CONTROLLER	LCU 3345	2.3			11.5	
ETHERNET GO 212/A CONTROLLER	LCU 3323	2.1	0.5		16.5	
320 KB MFDU (drive)	MFU 3432	0.55	0.85		13	M54
1 MB MFDU (drive)	MFS 7031	0.55	1.25		17.75	
20 MB STC (drive)	STS 6420	1			29 *	M64/70
45/60 MB (operating) STC (drive) (start)	STS 7037	0.6 0.6	1.7 4.4		23.4 55.8	
20 MB HDU (operating) (drive) (start)	HDU 7041	0.6 0.6	2.65 3		22.8 29	M54/64
40 MB HDU (operating) (drive)	HDU 7042	0.9 1.3	2.4 4.5		33.3 60.5	M54/64
65/140 MB (operating) HDU (drive) (start)	HDU 7043 HDU 7051	0.9 1.3	2.4 4.5	0.6	33.3 60.5	
60/120 MB HDU (drive)	HDU 7061 HDU 7063					M64/70
275 MB HDU (drive)	HDU 7065	6.16		0.55		M64/70

* Current consumption at +24 V = 1 Amp.

MODULE DESCRIPTION	P.d.G. REFERENCE NAME	CURRENT DRAIN (A)			POWER (W)	SYSTEMS CONCERNED (1)
		+5 V	+12 V	-12 V		
ENCODING CTLR GO 257	DEM 3330	1.85	0.1		9.75	M54/64
ENCODING CTLR GO 257/C	DEM 3477	1.85	0.1		9.75	
REAL TIME CLOCK GO 257/A	RTC 3311	1.51	0.1		8	M54
TRIVALENT VIDEO CTLR. GO 252	KDC 3341	2.3			11.5	
GRAPHIC EXPANSION GO 255/A	MEG 3354	3.2			16	
V24+LION 9.6 LINE CTLR. GO 256/A	LPU 3398	2.79	0.17	0.05	16.6	
2xV24 LINE CONTROLLER GO 236	LPU 3348	2.74	0.12	0.1	15.26	
MULTIPLEX CONTROLLER GO 322	MUX 3388	3.81	0.2	0.06	22.17	M54
	MUX 7089	3.81	0.2	0.86	22.17	M64/70
	MUX 3688	3.81	0.2	0.06	22.17	M54
	MUX 7091	3.81	0.2	0.06	22.17	M64/70
MULTIFUNCTION KEYBOARD		0.4	0.05		2.6	
PIN-PAD PIN 1440		0.35	0.05		2.35	
BADGE READER MBR 1932		0.1			0.5	
BADGE READER MBW 1810		0.1			0.5	

5.4 D.C. AND A.C. POWER FOR PERIPHERALS INTEGRATED INTO NL1 SYSTEMS

COMMERCIAL MODULE	CURRENT (A)		POWER (W)	
	+ 5 V	+12 V	D.C.	A.C.
OPE XM5221 20 MB	0.6	1.65	23	33
MICROPOLIS 1323/A 40 MB	0.9	3.9	51	73
WREN II DEPOPUL. 40 MB	1.4	4.5	61	87
MICROPOLIS 1325 65 MB	0.9	3.9	51	73
CDC WREN II 65 MB HDU	1.4	4.5	61	87
FUJITSU M2312 60 MB	3.5	(-) 3	54	77
FUJITSU M 2322 120 MB	3.5	(-) 3	54	77
FUJITSU 140 MB HDU	1.6	1.8 - 4.8	30 - 65	43 - 93
MICROPOLIS 1355 140 MB	1.5	2	31.5	45
PATRIOT 9720 275 MB HDU	6.1	(-) 0.55	37	53
5437 45/60 MB STS	0.6	1.6 $\pm$ 0.8	3 - 48	43 - 63
3432 MFU/3433 MFE 320 KB	0.55	0.85	12.95	18.5
3426 MFU/3427 MFE 1 MB	0.55	1.25	17.75	25.36
CYPHER MTU 40 MB	2.85		14.25	20.4
PIN 1440	0.35	0.05	2.35	3.36
1932 MBR	0.1		0.5	0.7
1810 MRW	0.1		0.5	0.7
ANK 14XX NKB 14XX	0.35	0.05	2.35	3.36
ANK 1446/47	0.45	0.25	5.25	7.5

5.5 EXAMPLES OF CALCULATIONS

EXAMPLE OF CALCULATION FOR M54

MODULE	POWER DRAIN	
	D.C. W	A.C. W
1 UC 070	19	27.2
1 MEM 7024	15	21.5
1 HDU 3465	33.3	47.7
1 MFU 3426	17.95	35.36
4 ELB 3683	200	286
4 DSM 3615	----	200
4 ANK 1401	9.4	13.7
TOTAL	294.65	621 to which is added 20 W for a fan.

MOS configuration entry level.

EXAMPLE OF CALCULATION FOR M64

MODULE	POWER DRAIN	
	D.C. W	A.C. W
1 UC 070	19	27.2
1 MEM 7024	15	21.5
1 MEM 7022	10	14.3
1 HDU 7043	33.3	47.7
1 STS 7037	23.4	33.46
6 ELB 3683	300	429
6 DSM 3615	----	300
6 ANK 1401	14.1	20.16
TOTAL	427.3	911.2 To which 40 W is added for two fans

Typically a BCOS processing configuration.

EXAMPLE OF CALCULATION FOR A MONOPROCESSOR M70

MODULE	POWER DRAIN	
	D.C. W	A.C. W
1 UC 071	29.5	42.2
1 CDS 7099	12.5	17.9
1 MEM 6034	16.5	23.6
1 MEM 6032	12.5	17.9
1 HDU 7051	33.3	47.7
1 STS 7037	23.4	33.46
8 ELB 3683	400	572
8 DSM 3615	----	400
8 ANK 1401	18.8	26.88
TOTAL	546.5	1181.6 To which 40 W is added for two fans

Typically MOS processing configuration.

EXAMPLE OF CALCULATION FOR TRIPROCESSOR M70

MODULE	POWER DRAIN	
	D.C. W	A.C. W
1 UC 071	29.5	42.2
1 APU 7070	59	84.37
1 CDS 7099	12.5	17.9
1 MEM 6034	16.5	23.6
1 MEM 6032	12.5	17.9
1 HDU 7075	33.3	47.7
1 MTU 7040	14.25	20.37
12 ELB 3683	600	858
12 DSM 3615	----	600
12 ANK 1401	28.1	40.2
TOTAL	805.65	1752.2 To which is added 40 W for two fans.

High level MOS processing configuration.

5.6 CHARACTERISTICS OF EACH MODULE

Lists follow of the main characteristics of the integral modules, the magnetic peripherals, the printers and the corresponding connection cables for the NL1 - M54/64/70 systems. Module dimensions are expressed in centimeters.

M54

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/h)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
110 115 120 220 240	50-60	* 122	* 105	15	10-40	20-80	0.25	28

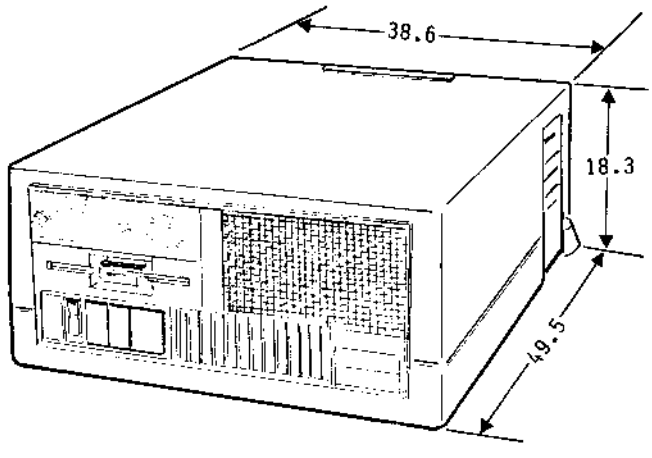


Figure 5-1 - Signal and power cable outlets: right side

NOTE: * With the configuration in the example of calculation taking account of the integrated modules (i.e. without the ELB, Video and keyboard).

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/h)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
110 115 220 240	50-60	* 144	* 124	70	10-40	20-80	0.25	140

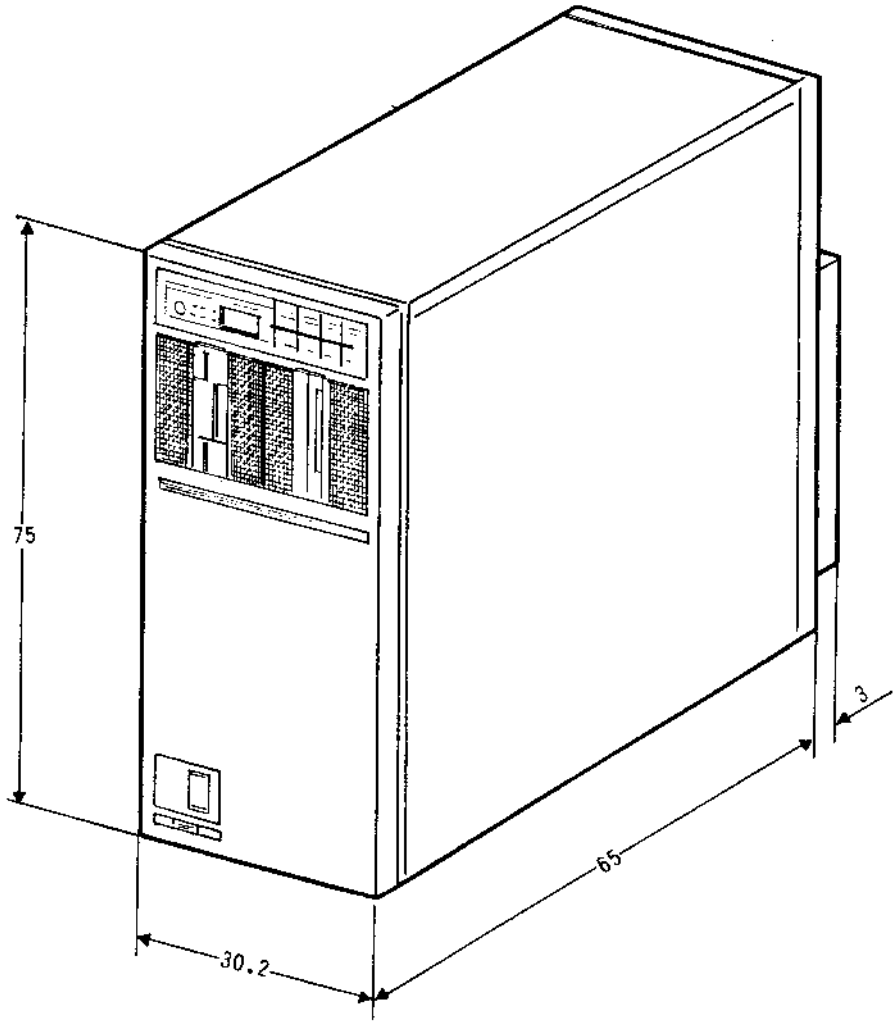


Figure 5-2 - Characteristics and dimensions of M64

NOTE: * With the configuration in the example of calculation taking account of the integrated modules (i.e. without the ELB, Video and keyboard).

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/h)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
110 115 220 240	50-60	* 183	* 1575	70	10-40	20-80	0.25	140

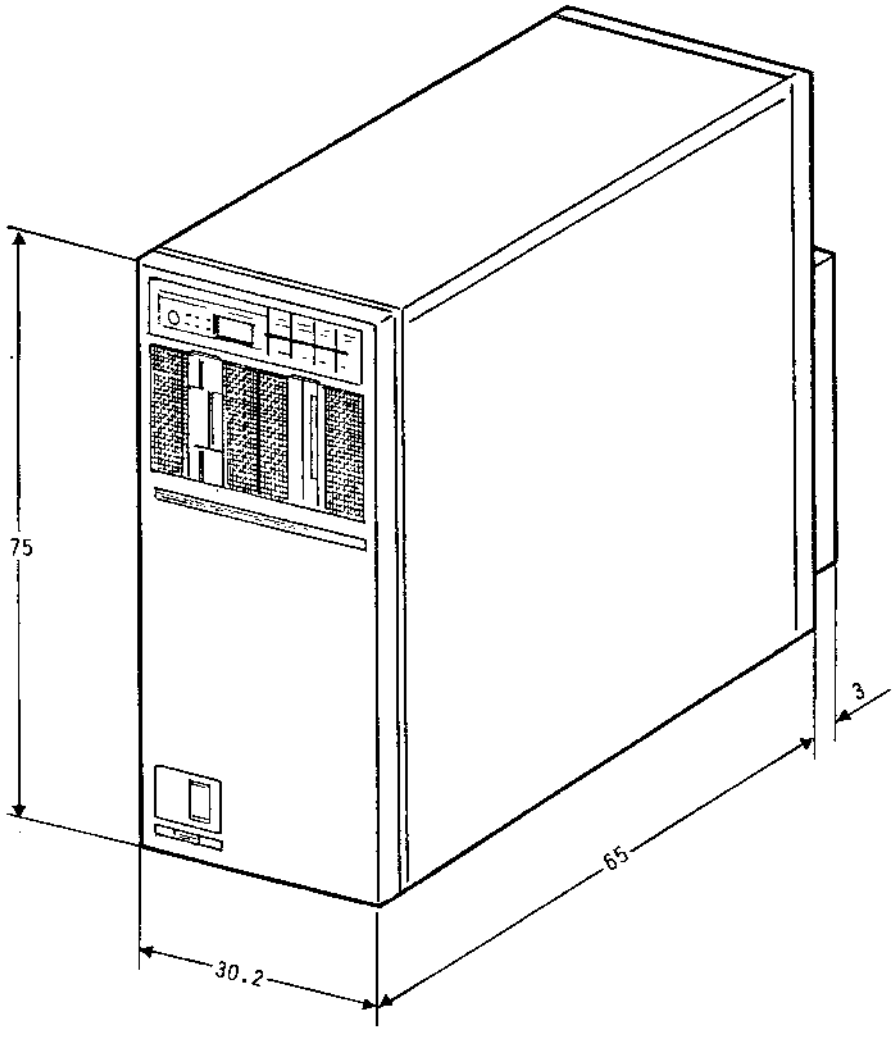


Figure 5-3 - Characteristics and dimensions of M70

NOTE: * With the configuration in the example of calculation taking account of the integrated modules (i.e. without the ELB, Video and keyboard).

CAB 7019 (SB1)

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/h)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
110 115 220 240	50-60			20	10-40	20-80	0.25	

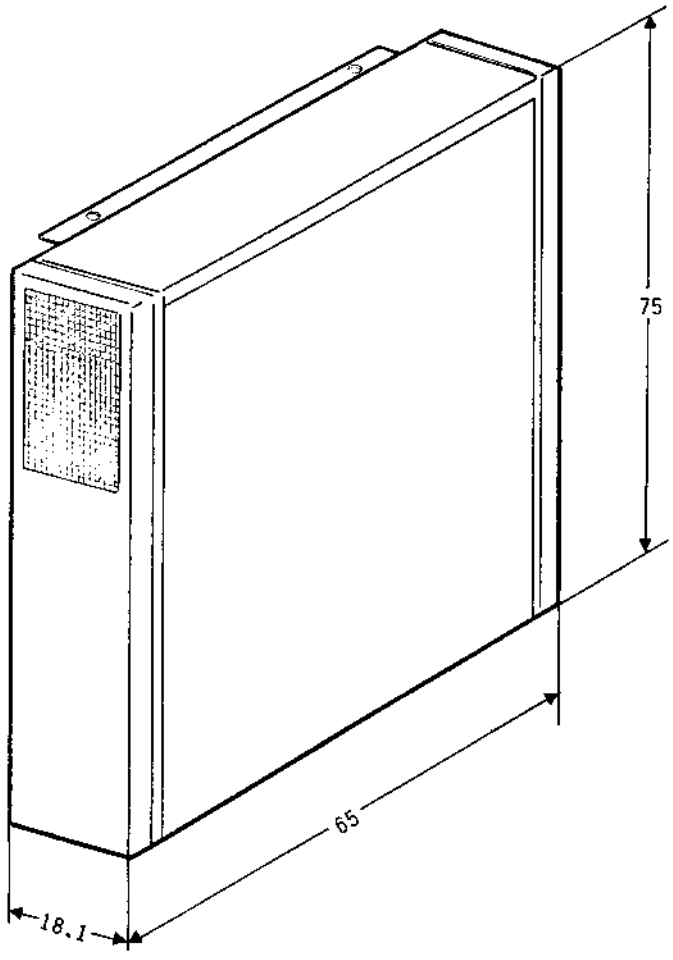


Figure 5-4 - Characteristics and dimensions of CAB 7019 (SB1)

CAB 7018 (SB2)

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/h)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
110 115 220 240	50-60			150	10-40	20-80	0.25	

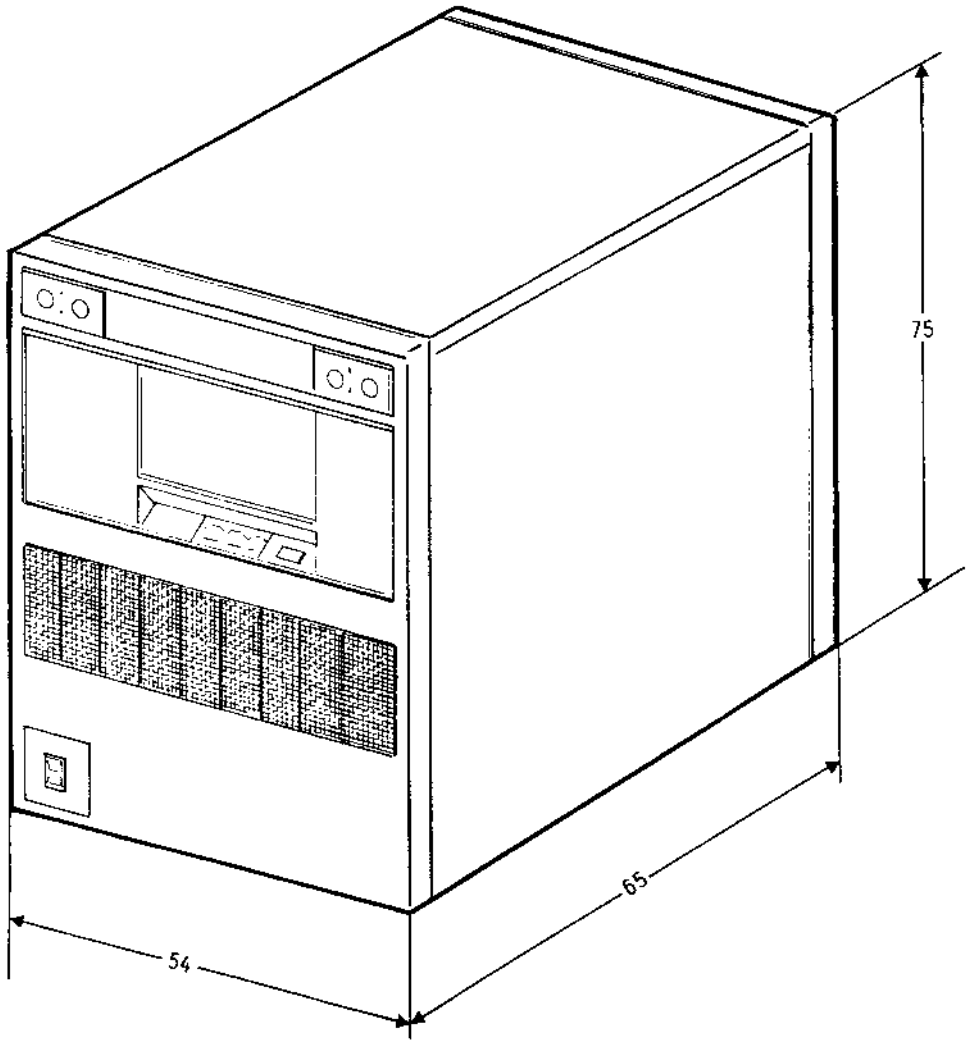


Figure 5-5 - Characteristics and dimensions of CAB 7018 (SB2)

ASD 3384 AUTOMATIC START DEVICE

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/h)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
110 115 220 240	50-60	6.5 dc	5.5	5	10-40	20-80	-	-

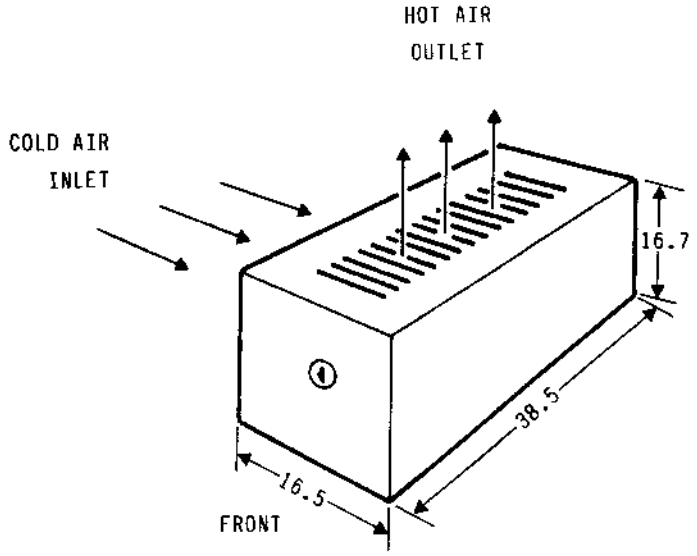


Figure 5-6 - Characteristics and dimensions of ASD 3384

NOTE: The cable outlets are at the rear of the unit.

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/h)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
+ 5 +12	50-60	33	28.5	1.5	5-50	8-80	0.25	-

MIN to MAX ALTITUDE	OPERATING -300 to +3000 m
	NOT OPERATING -300 to +10000 m

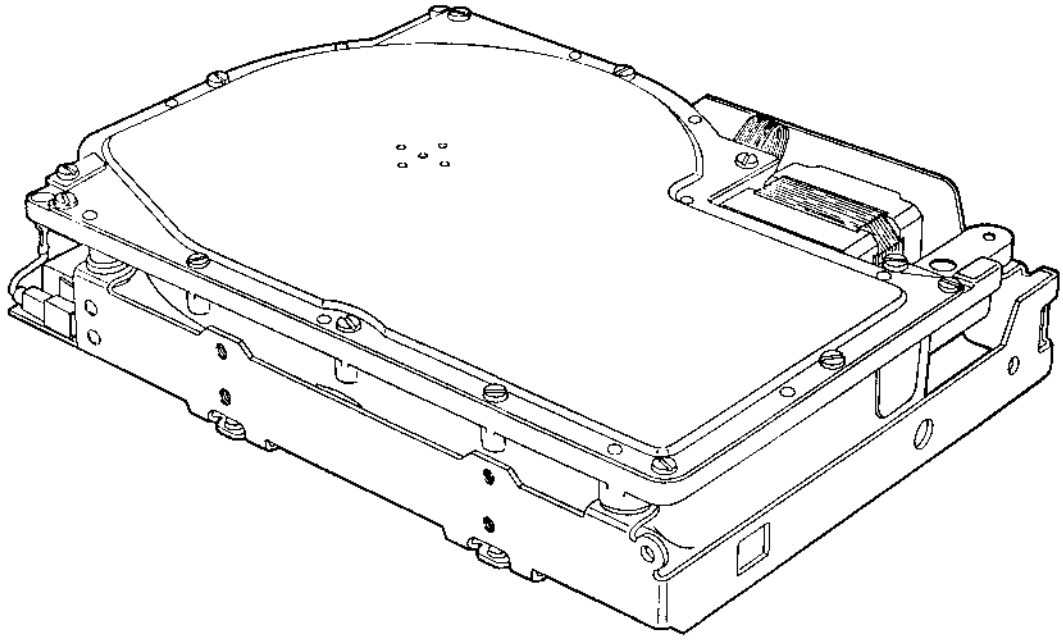


Figure 5-7 - Characteristics of OPE XM 5221 - 20 MB

WREN 11 / MICROPOLIS 1323/A - 1325 (40 - 65 MB) HDUs

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/h)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
+ 5 +12	50-60	* 87 **73	75 63	3.4	10-46	8-80	0.25	-

*	OPERATING
MIN to MAX	-300 to +3000 m
ALTITUDE	NOT OPERATING -1000 to +10000 m

* *	OPERATING
MIN to MAX	- 60 to +3000 m
ALTITUDE	NOT OPERATING -300 to +15000 m

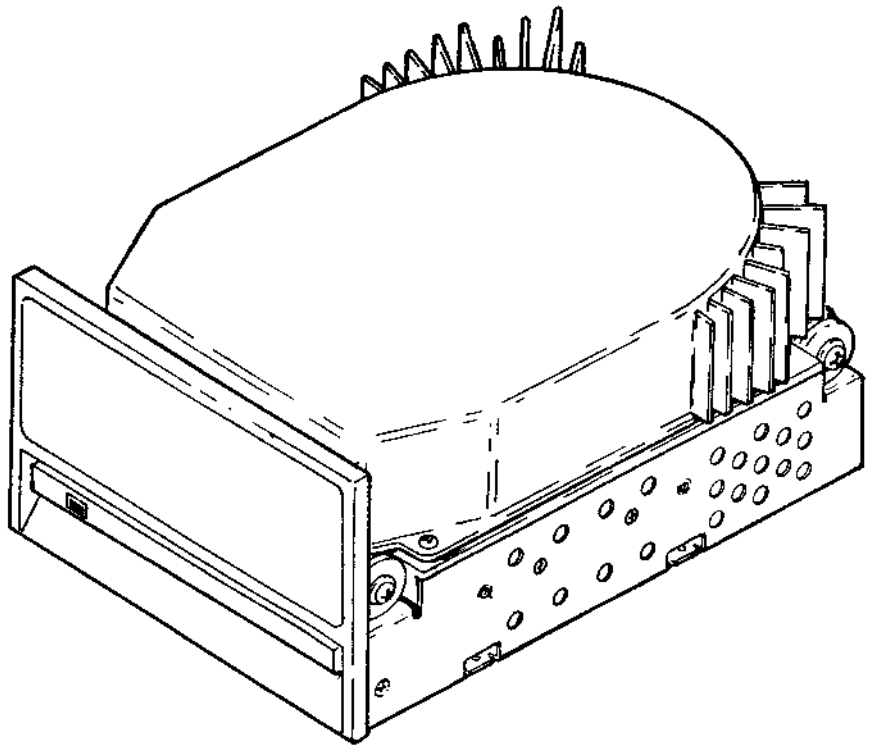


Figure 5-8 - Characteristics of WREN II / MICROPOLIS 1323/A, 1325

* Refers to the WREN II HDUs.

** Refers to the Micropolis HDUs.

FUJITSU / MICROPOLIS 1355 140 MB HDUs

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/h)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
110 115 220 ● 240	50-60	45	39	2.7	10-50	10-90	0.25	-

MIN to MAX ALTITUDE	OPERATING -300 to +3000 m
	NOT OPERATING -300 to +15000 m

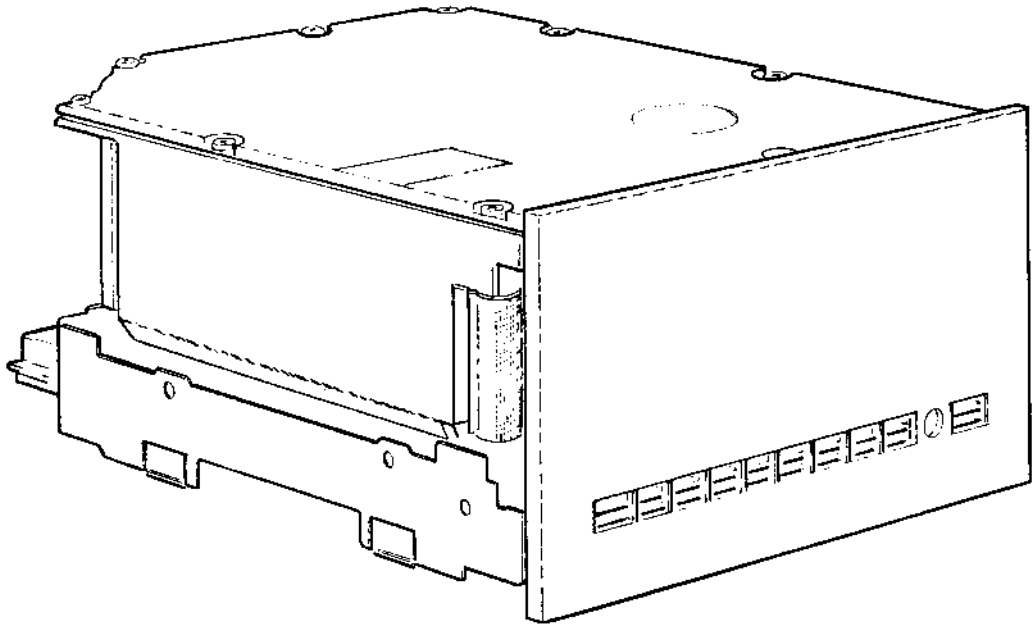


Figure 5-9 - Characteristics of 140 MB HDU

PATRIOT 275 MB HDU

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/h)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
220	50-60	53	45.5	12	10-45	10-90	0.25	-

MIN to MAX ALTITUDE	OPERATING -300 to +3000 m
	NOT OPERATING -300 to +12000 m

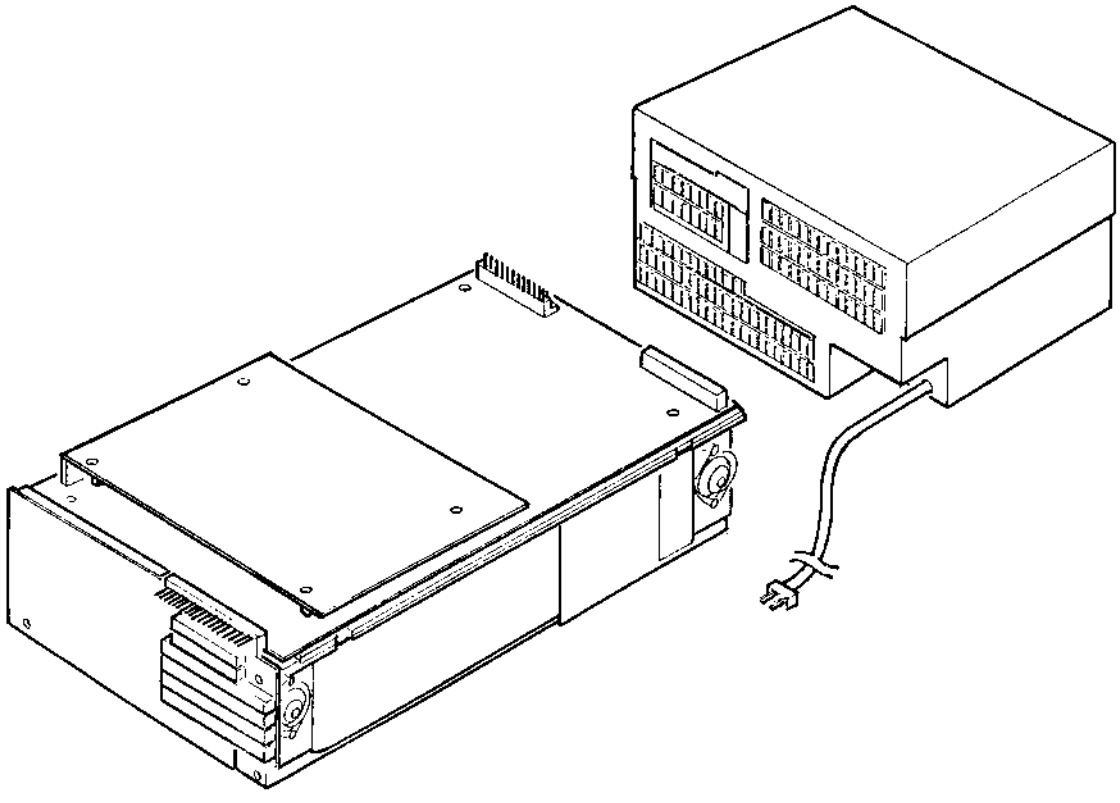


Figure 5-10 - Characteristics of PATRIOT 275 MB HDU

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/h)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
+ 5 +12	50-60	69	59.5	1.36	5-45	20-80	0.25	-

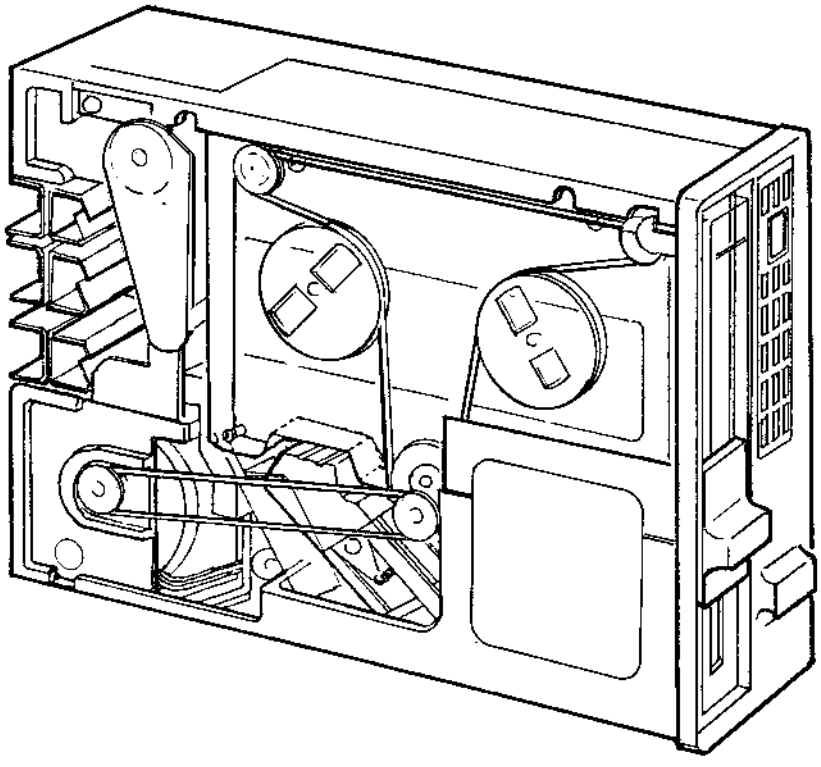


Figure 5-11 - Characteristics of STS 5437, 45/60 MB

MTU 3541

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/h)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
100 115 220 240	50-60	20.4	17.6	36	26 Max.	20-85	0.25	200 to 300

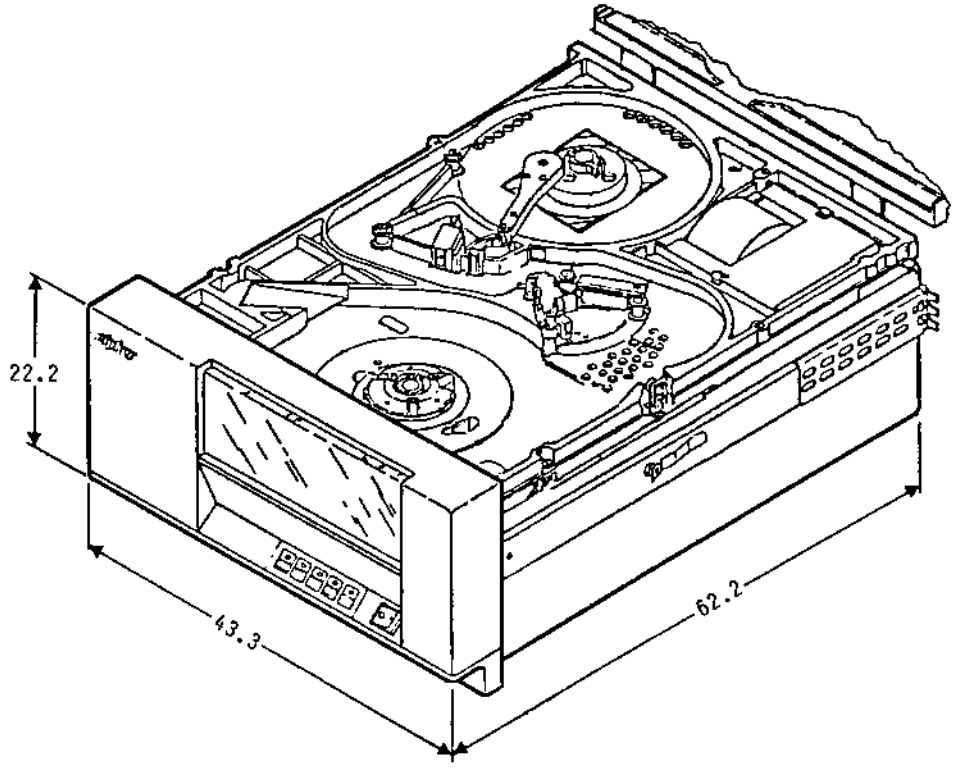


Figure 5-12 - Characteristics and dimensions of MTU 3541

NOTE: See the MTU cabinet drawing for the service area.

HDU 3560/3516 - FUJITSU 60/120 MB DISK UNIT

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/h)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
100 115 220 240	50-60	77	66.4	11	* 5-35	20-80	0.25	

MAX ALTITUDE	OPERATING 3000 m
	NOT OPERATING 12 000 m

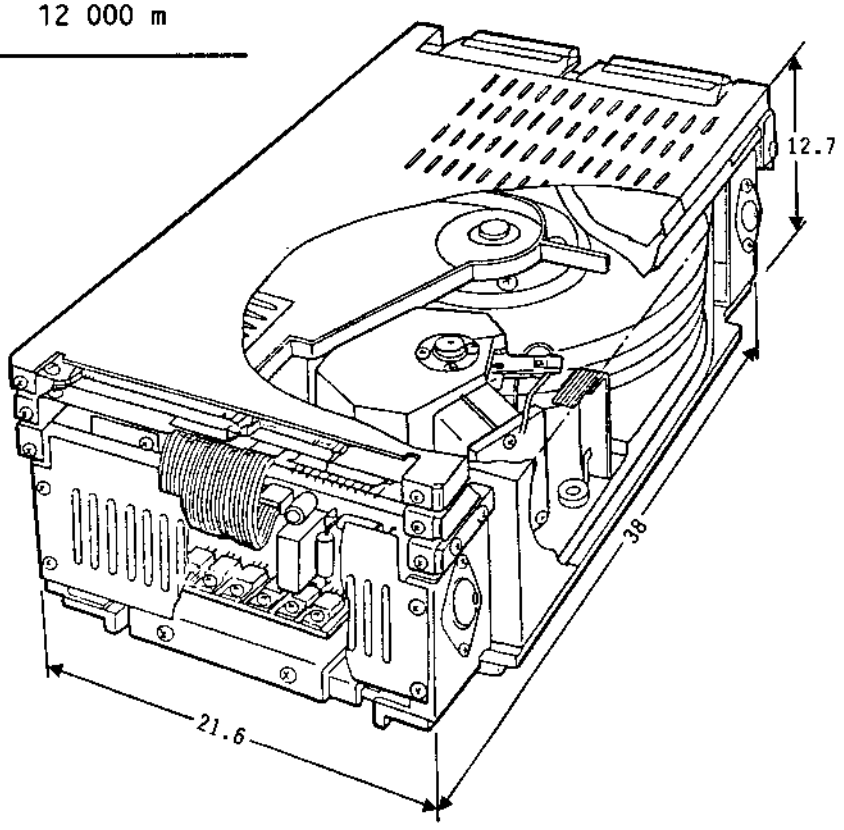


Figure 5-13 - Characteristics and dimensions of HDU 3560/3516

* See the MTU 3541 cabinet drawing.

NOTE: See the CAB 3548 drawing for the service area.

TRX 2000 (SET 3364)

Interface transceiver between coaxial cable and ETHERNET controller

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/h)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
100 115 220 240	50-60	8.57	7.37	0.48	5- 50	10-95	0.25	-

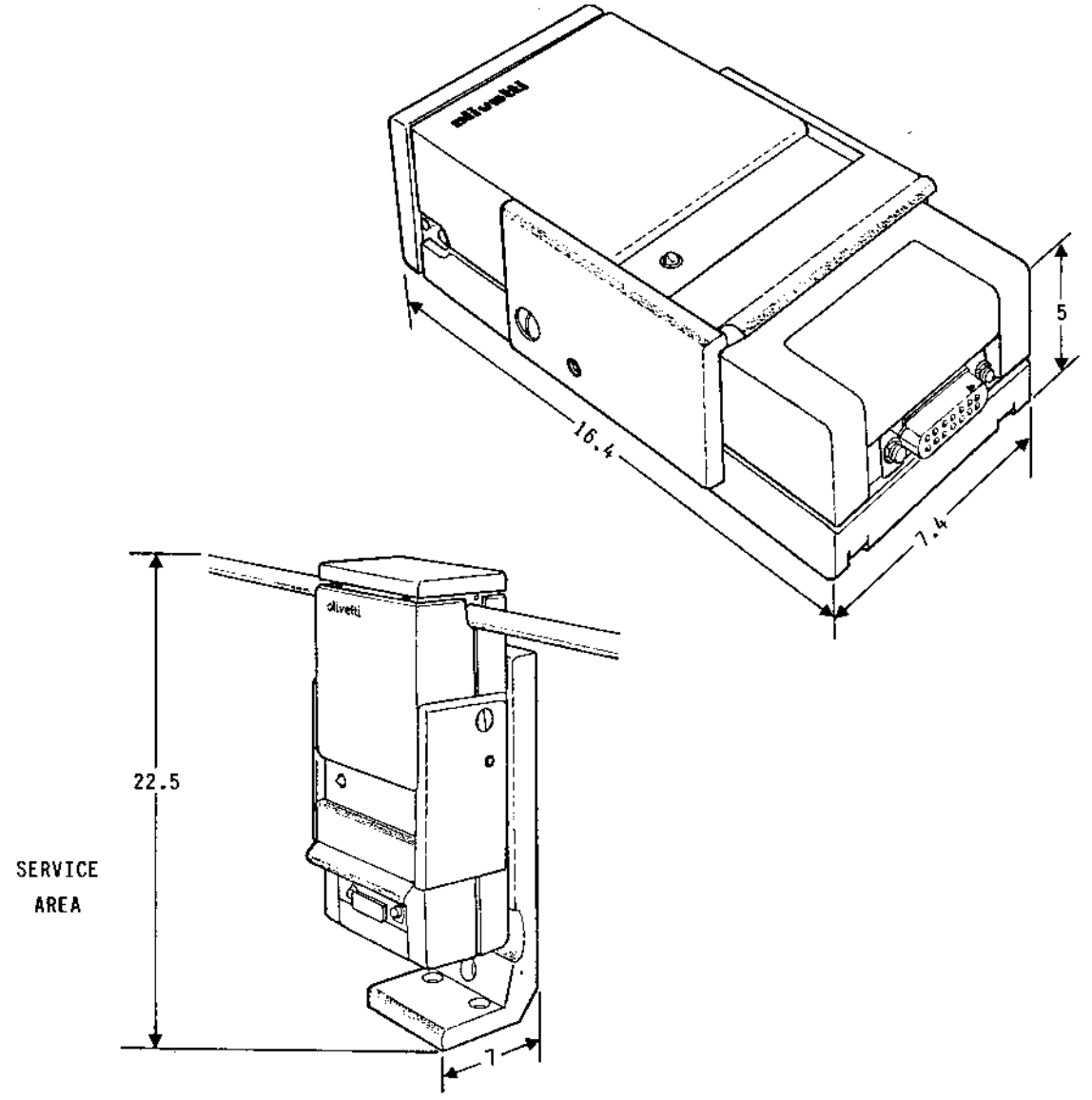


Figure 5-14 - Characteristics and dimensions of TRX 2000

ANK 14XX aN+F KEYBOARD (with or without keys)

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/h)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
+ 5 +12		3.36	3	2.4	10-40	10-95	0.25	-

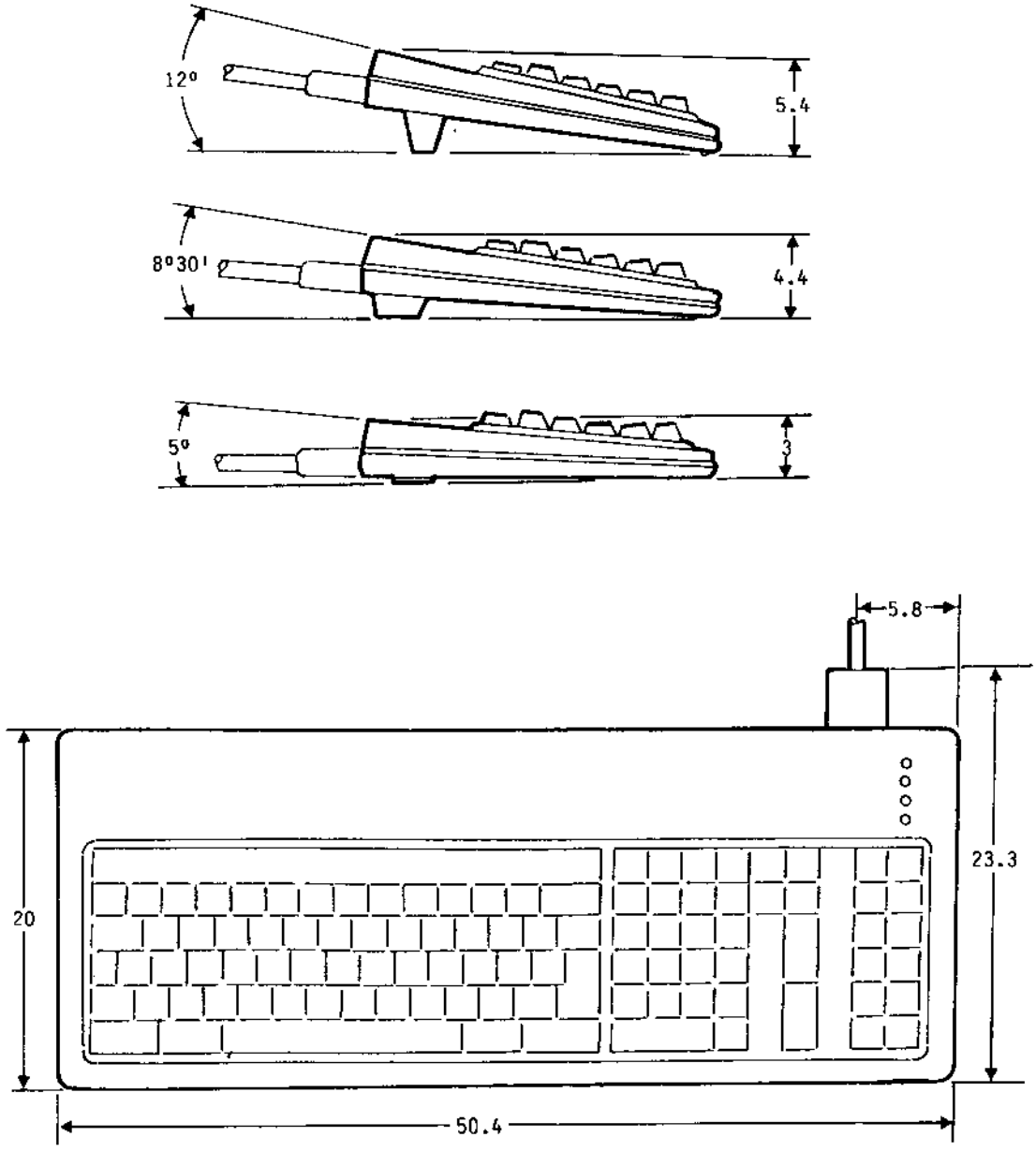


Figure 5-15 - Characteristics of ANK 14XX aN+F keyboard

NKB 1435 - 1436 N+F KEYBOARD

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/h)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
+ 5 +12		3.36	3	1	10-40	10-95	0.25	-

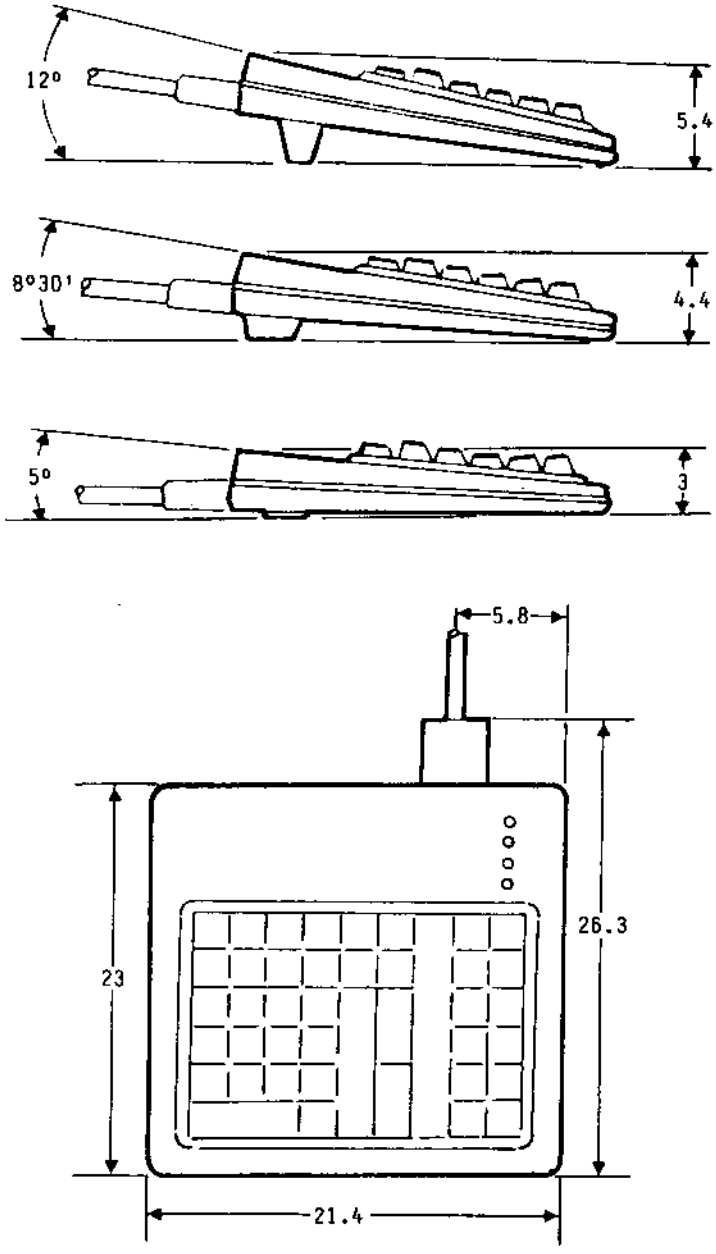


Figure 5-16 - Characteristics and dimensions of N+F keyboard

PIN PAD (PIN 1440)

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/h)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
+ 5 +12	-	3.36	3	0.25	10-40	10-95	0.25	-

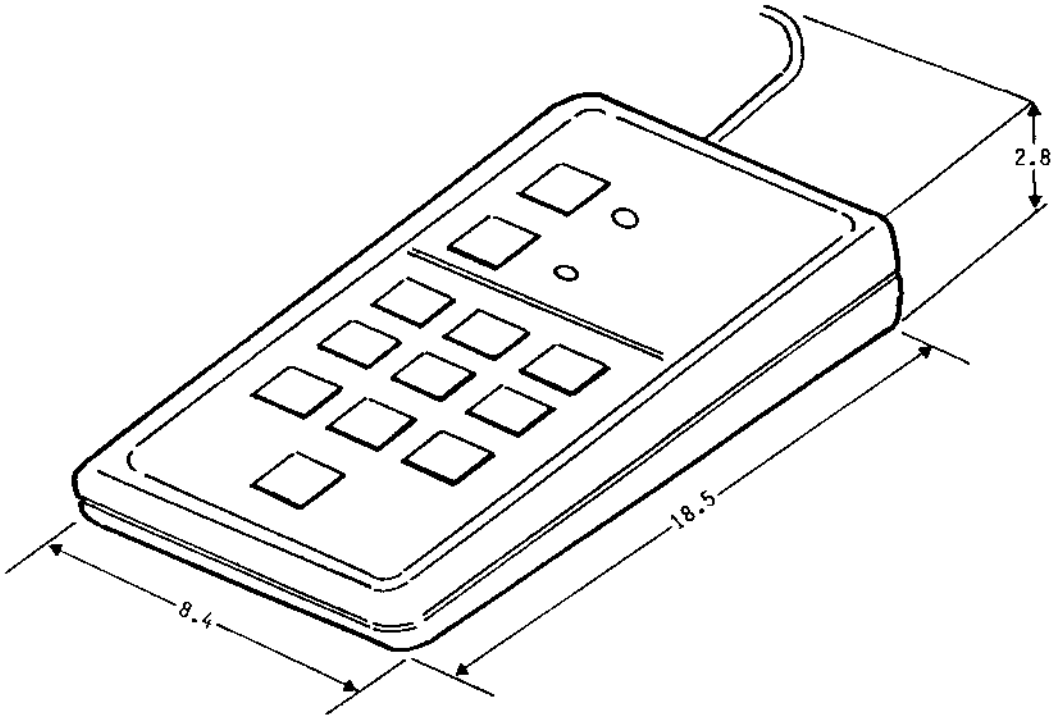


Figure 5-17 - Characteristics and dimensions of PIN PAD

MBR 1932 – Manual Badge Reader

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/h)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
+ 5	-	0.71	0.6	0.5	10-40	10-90	0.25	-

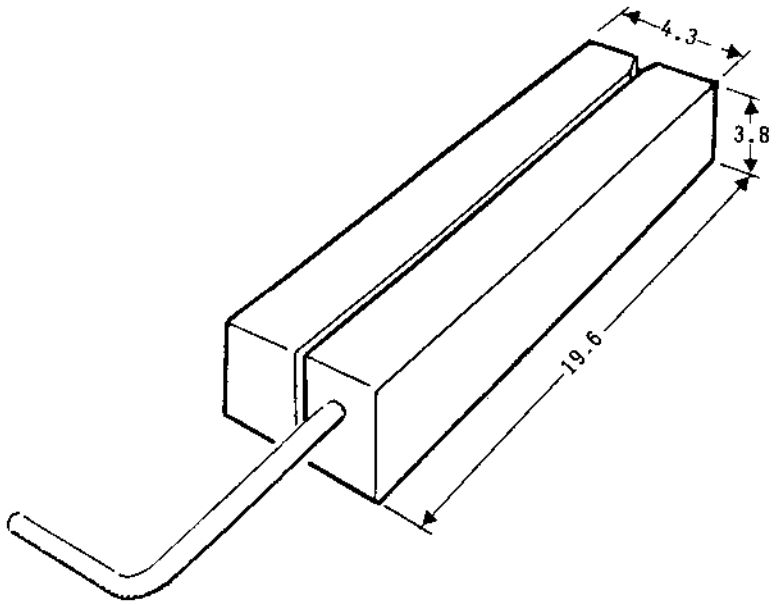


Figure 5-18 - Characteristics and dimensions of MBR 1932

BRW 1822 Motorised Badge Reader/Writer

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/h)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
110 115 120 220 240	50-60	17	14	9	10-40	10-90	0.25	-

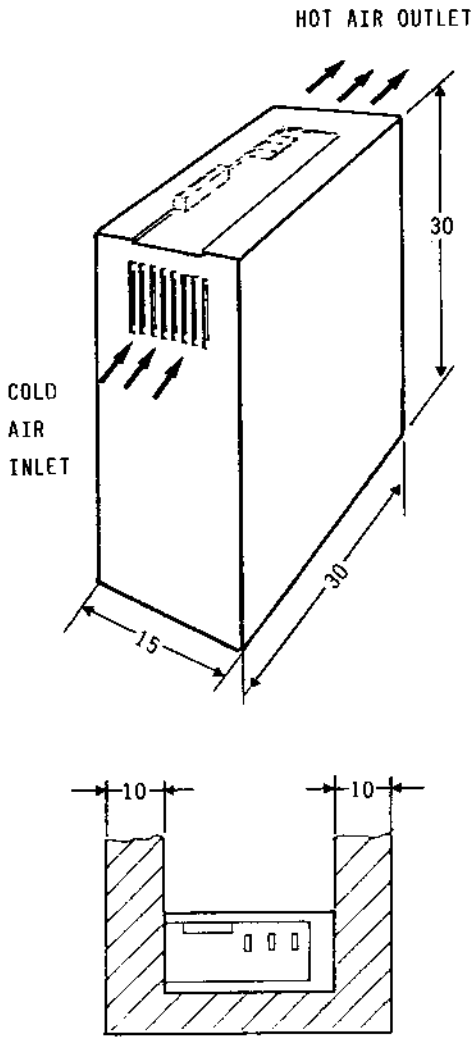


Figure 5-19 - Characteristics, dimensions and service area of BRW 1822

B/W ALPHANUMERICAL 9 in. VIDEO DSM 3619 (ex DSM 1219)
B/W TRIVALENT ALPHANUMERICAL 9 in. VIDEO DSM 3619 (ex DSM 1219)

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/h)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
110				(1)				
115				5.5				
120	50-60	35	30		10-40	10-95	0.25	-
220				(2)				
240				6.15				

NOTES: (1) Without support
(2) With support.

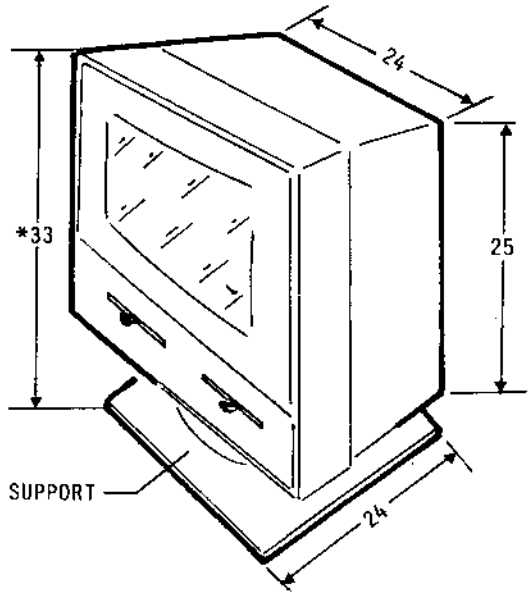


Figure 5-20 - Characteristics and dimensions of 9 in. video

* Maximum dimensions with base stand (with SET 1239).

Signal and power cable outlets are on the rear of the unit.

Ventilation area: When the unit is placed in a "niche", a space of at least 10 cm must be left around it for ventilation.

B/W ALPHANUMERICAL 15 in. VIDEO DSM 3615 (ex DSM 1215)
B/W GREEN PHOSPHOR GRAPHIC 15 in. VIDEO DSM 3616 (ex DSM 1216)

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/h)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
110 115 120 220 240	50-60	50	43	12.25	10-40	10-95	0.25	-

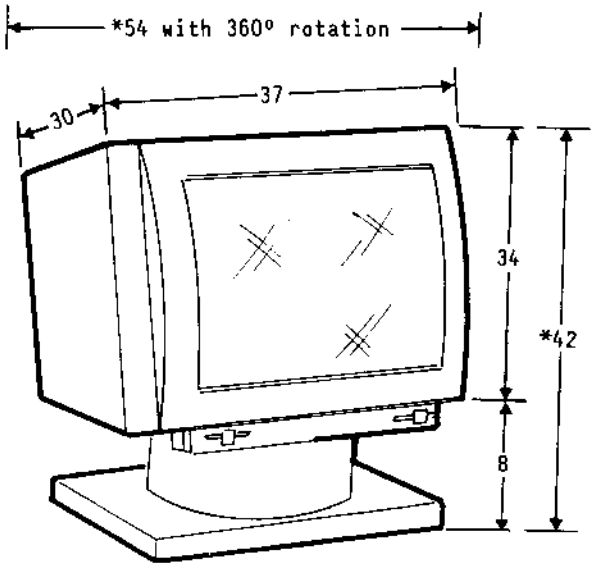


Figure 5-21 - Characteristics and dimensions of 15 in. video

* Maximum dimensions with base stand.

Signal and power cable outlets are on the rear of the unit.

Ventilation area: When the unit is placed in a "niche", a space of at least 10 cm must be left around it for ventilation.

ELB 1381/2 WORK STATION

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal.h)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
110 115 120 220 240	50-60	6(1381) 20(1382)	5 17	3.5 4	10-40	20-80	0.25	-

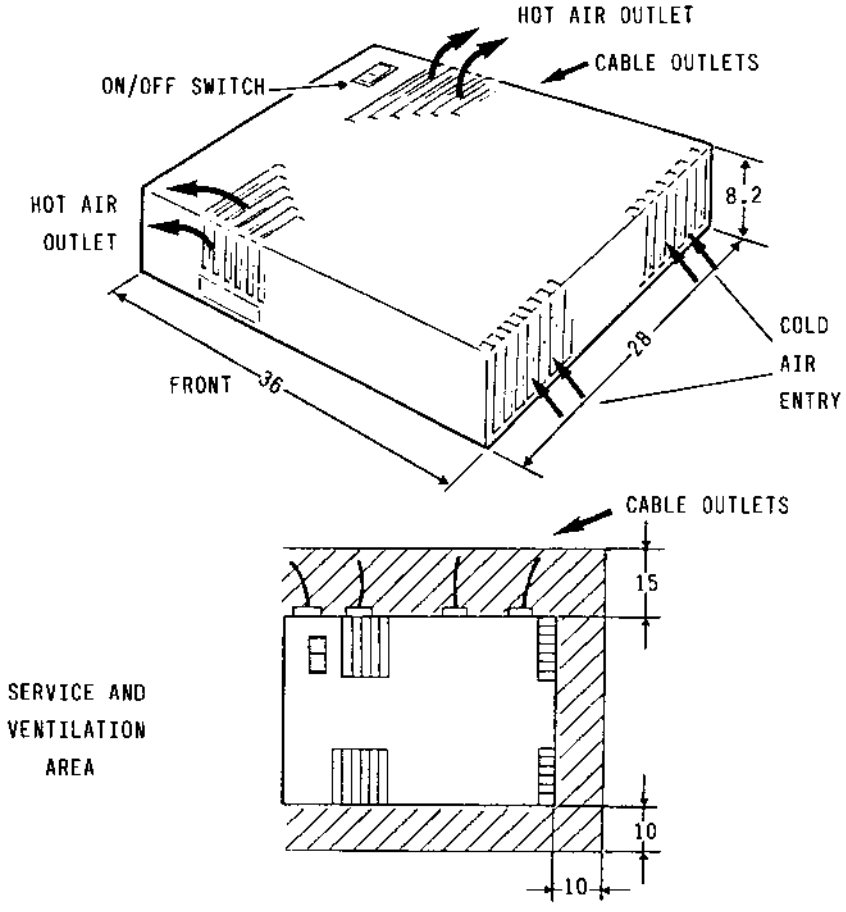


Figure 5-22 - Characteristics, dimensions and service area of ELB 1381/2 WS

NOTE: The ventilation slits on top of the ELB casing for a hot air exit must not be obstructed. However, the 15 in. video can be mounted on top of the ELB using a distancing ring (SET 1245).

ELB 3683/4 WORK STATION

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/H)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
110 115 120 220 240	50-60	50	43	3.2	10-40	20-80	0.25	-

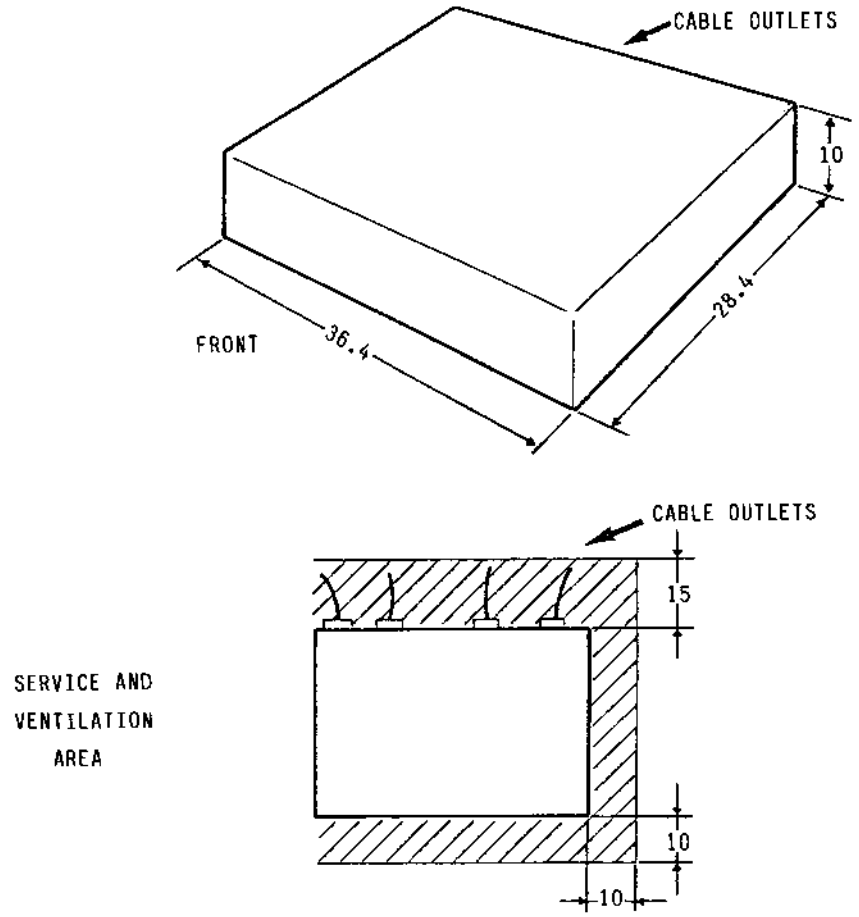
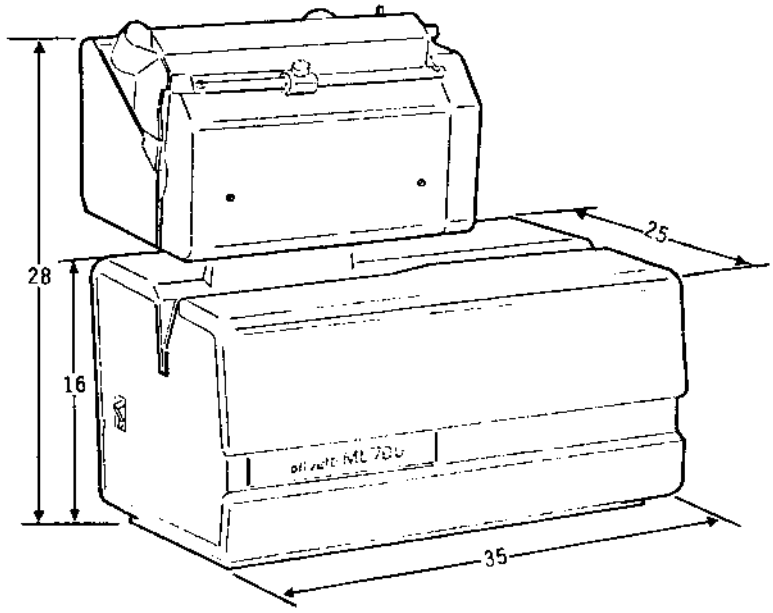


Figure 5-23 - Characteristics, dimensions and service area of ELB 3683/4 WS

ML 700 MAGNETIC AND OPTICAL READER

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/H)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
110 115 120 220 240	50-60	30 (64 at switch on)	26	14.6	10-45	15-90	0.25	-



SERVICE AND VENTILATION AREA

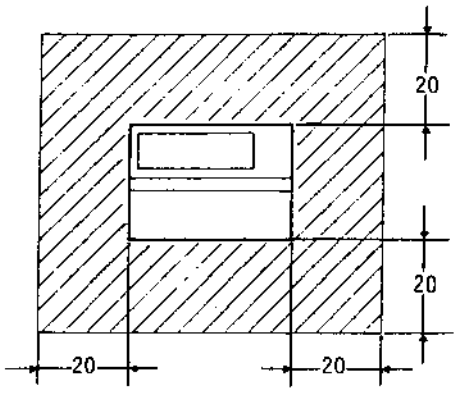


Figure 5-24 - Characteristics, dimensions and service area of ML 700

PR 19 SERIAL IMPACT PRINTER
with two way printing at 300 ch/s in 132 positions.

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/H)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
110 115 120 220 240	50-60	150	129	16	10-40	15-85	0.25	-

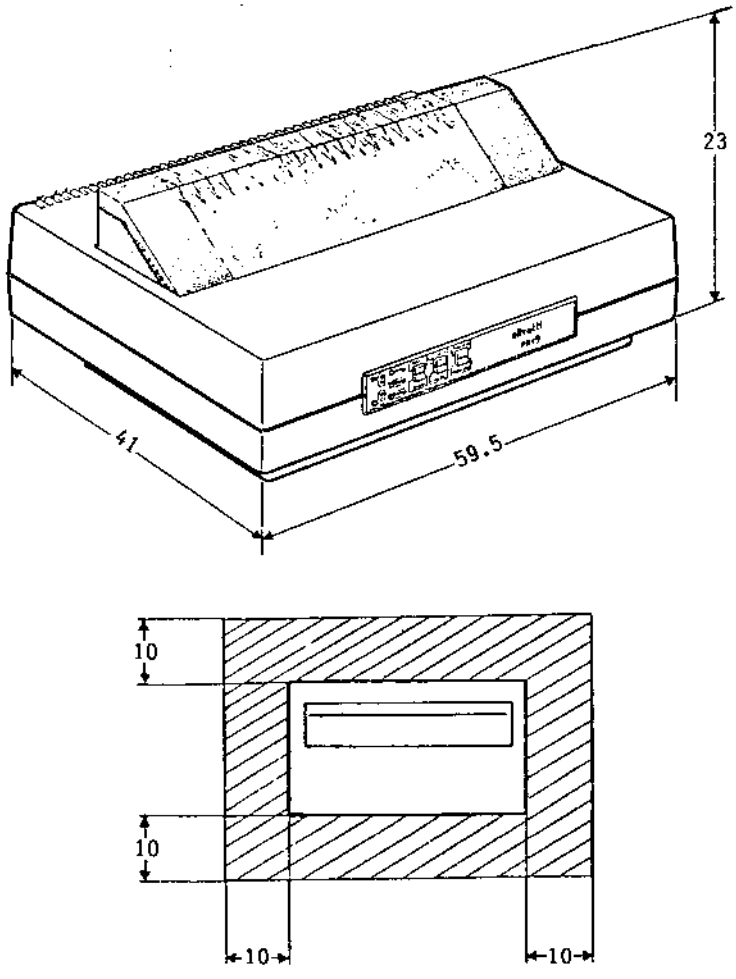


Figure 5-25 - Characteristics, dimensions and service area of PR 19

PR 2890 NEEDLE PRINTER

for banking applications with automatic cutting of printed document. Ballistic type head, uni-directional, 100 ch/s in 132 positions (0.1 in.).

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/H)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
110 115 120 220 240	50-60	50	43	10	10-40	15-95	0.25	-

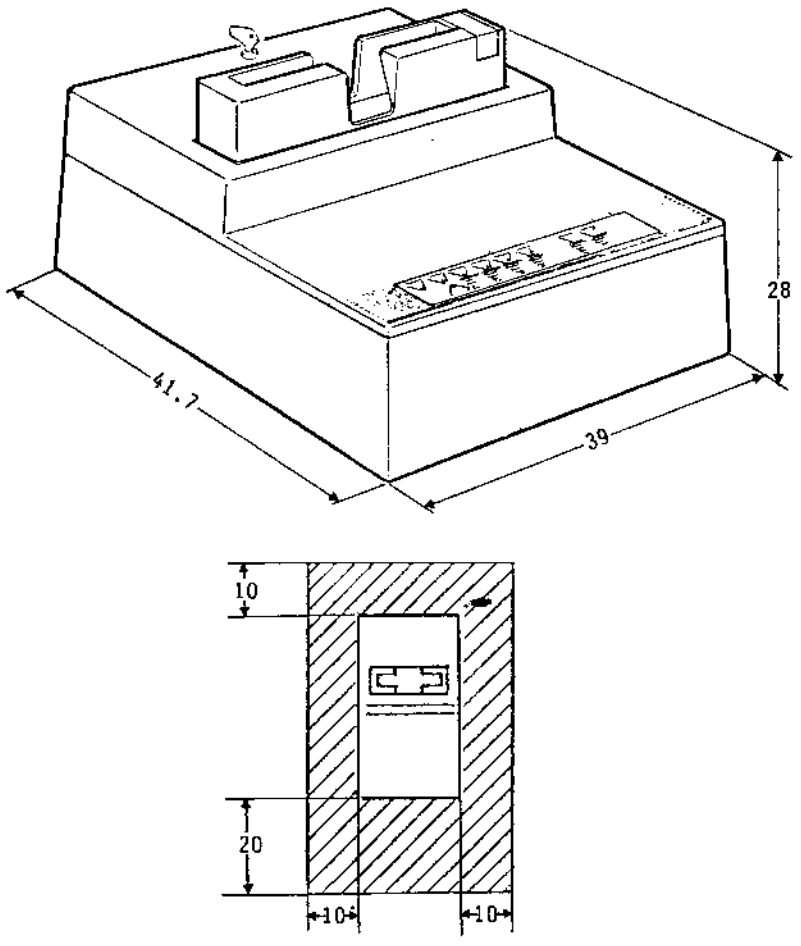


Figure 5-26 - Characteristics, dimensions and service area for PR 2890

PR 40 BOOKLET PRINTER

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/H)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
100 115 220 240	50-60	60	51.6	12	10-40	15-95	0.25	-

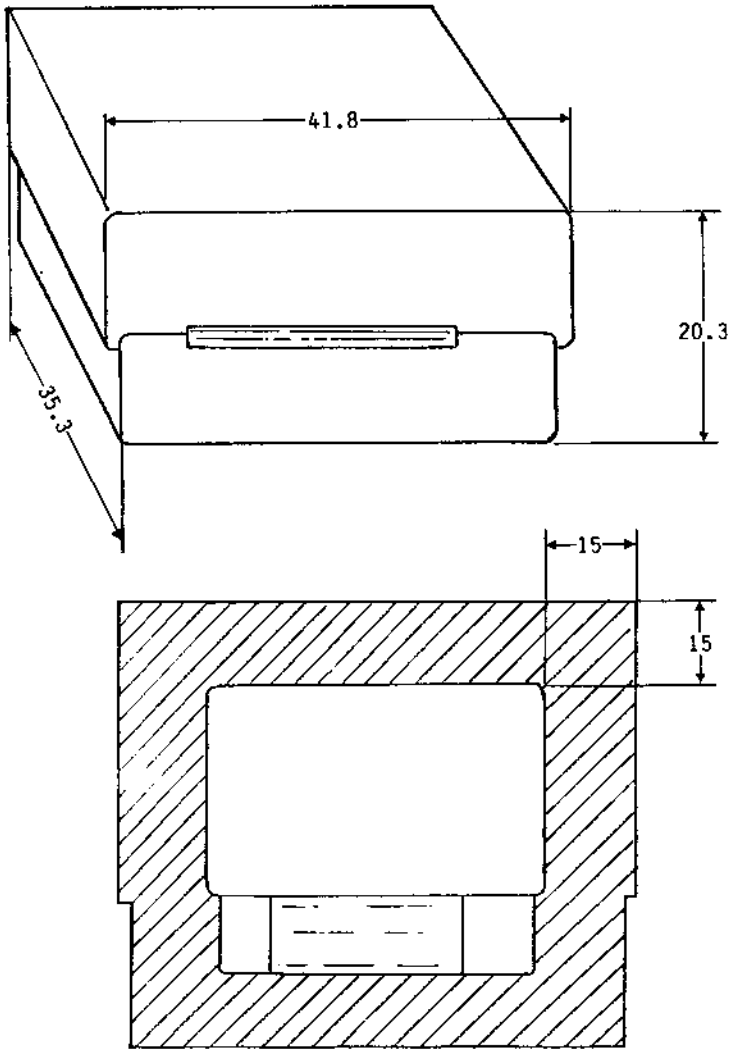
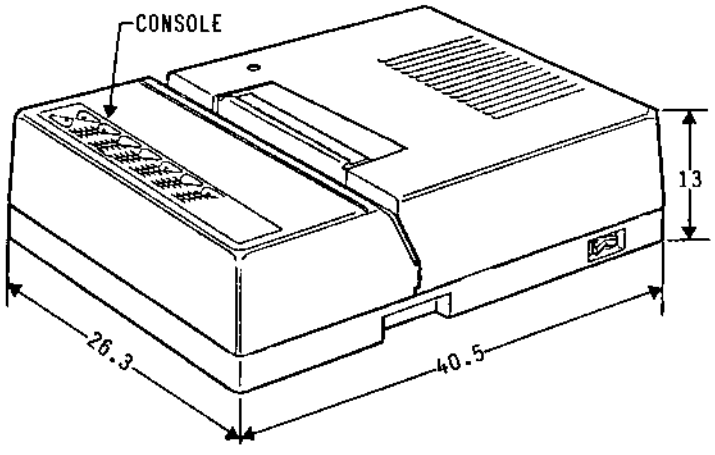


Figure 5-27 - Characteristics, dimensions and service area of PR 40

PR 2880 NEEDLE PRINTER FOR BANKING APPLICATIONS.
The ballistic type head has 100 ch/s speed on 40 printing positions (0.1 in.).

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/H)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
110 115 120 220 240	50-60	50	43	7	10-40	15-95	0.25	-



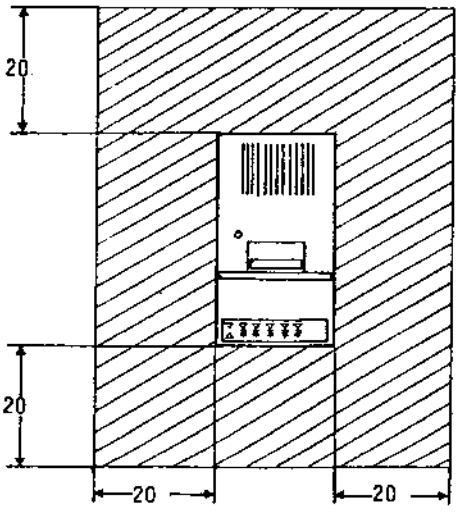


Figure 5-28 - Characteristics, dimensions and service area of PR 2880

PR 15 GENERAL PURPOSE PRINTER

A matrix printer with ballistic head, two-way, 120 ch/s hard copy and 80 printing positions (0.1 in.).

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/H)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
110 115 120 220 240	50-60	36	31	7.8	10-40	15-95	0.25	-

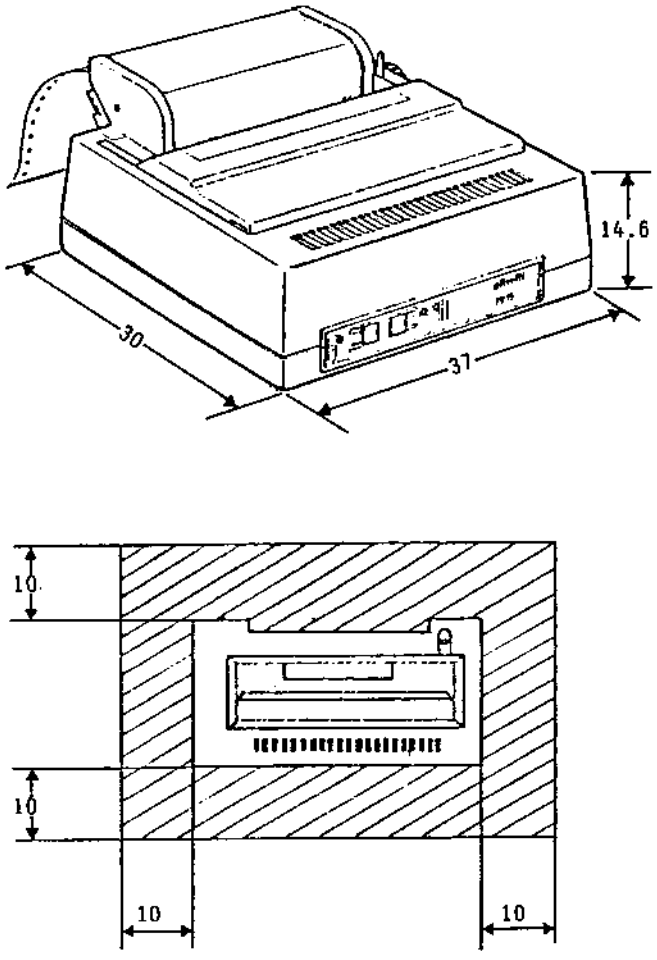
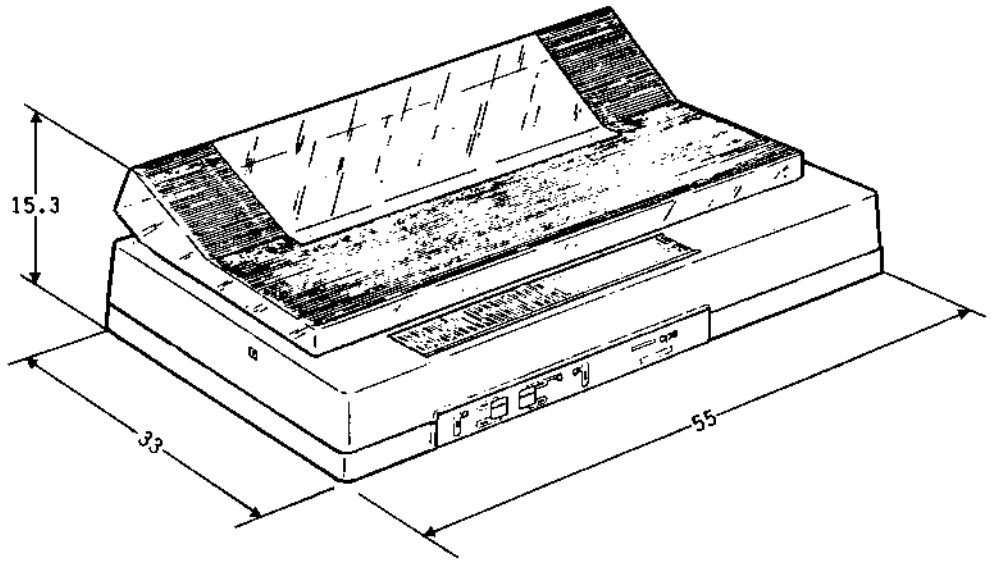


Figure 5-29 - Characteristics, dimensions and service area of PR 15

PR 17B COMPACT DESK-TOP NEEDLE PRINTER
for standard software applications.

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/H)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
100 115 220 240	50-60	36	31	10	10-40	15-95	0.25	-



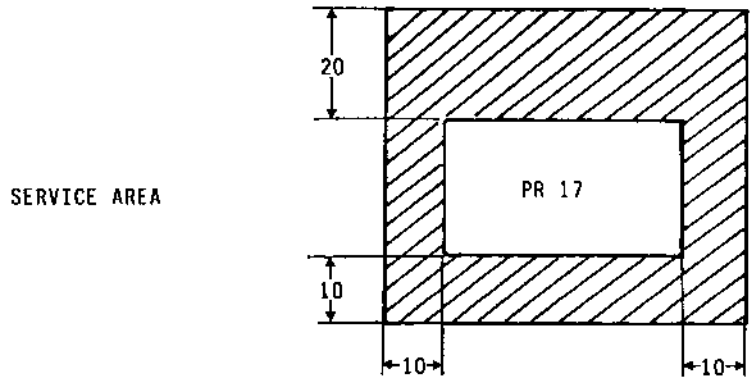
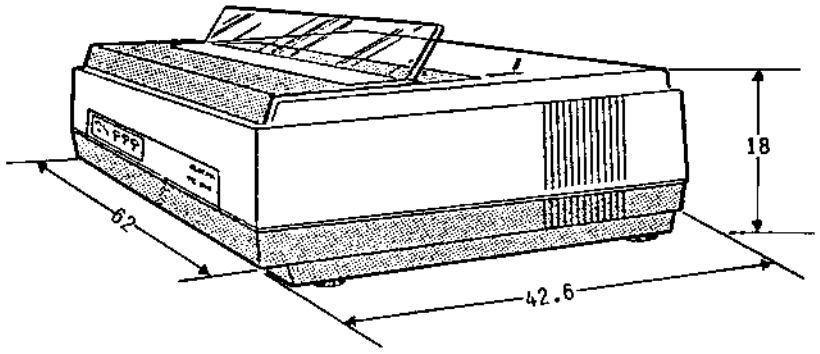


Figure 5-30 - Characteristics, dimensions and service area of PR 17B

PR 1580 GENERAL PURPOSE PRINTER

Matrix printer with ballistic head, two way for hard copy at 100 and 400 ch/s. 132 printing positions (0.1 in.).

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/H)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
110 115 120 220 240	50-60	120	103	22	20-40	40-80	0.25	-



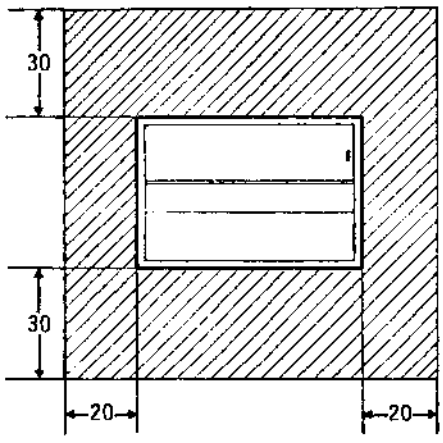


Figure 5-31 - Characteristics, dimensions and service area of PR 1580

PR 2850 PRINTER FOR BANKING APPLICATIONS

A needle matrix printer with 100 ch/s two way printing and 132 printing positions.

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/H)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
110 115 120 220 240	50-60	110 (180 in print)	95	38	10-35	10-85	0.25	25

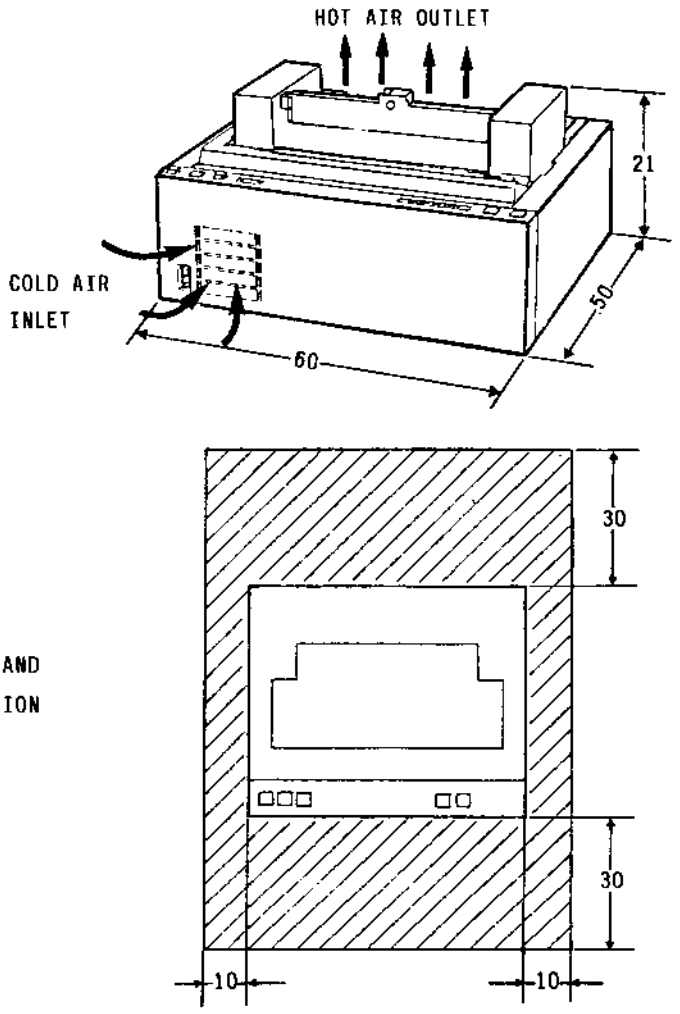


Figure 5-32 - Characteristics, dimensions and service area of PR 2850

PR 3300/3600 MEDIUM SPEED PARALLEL PRINTERS WITH CHARACTER BANDS
317 lines per minute.

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/H)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
100 115 220 240	50-60	250 (350 in print)	301	70	10-30	20-80	0.25	-

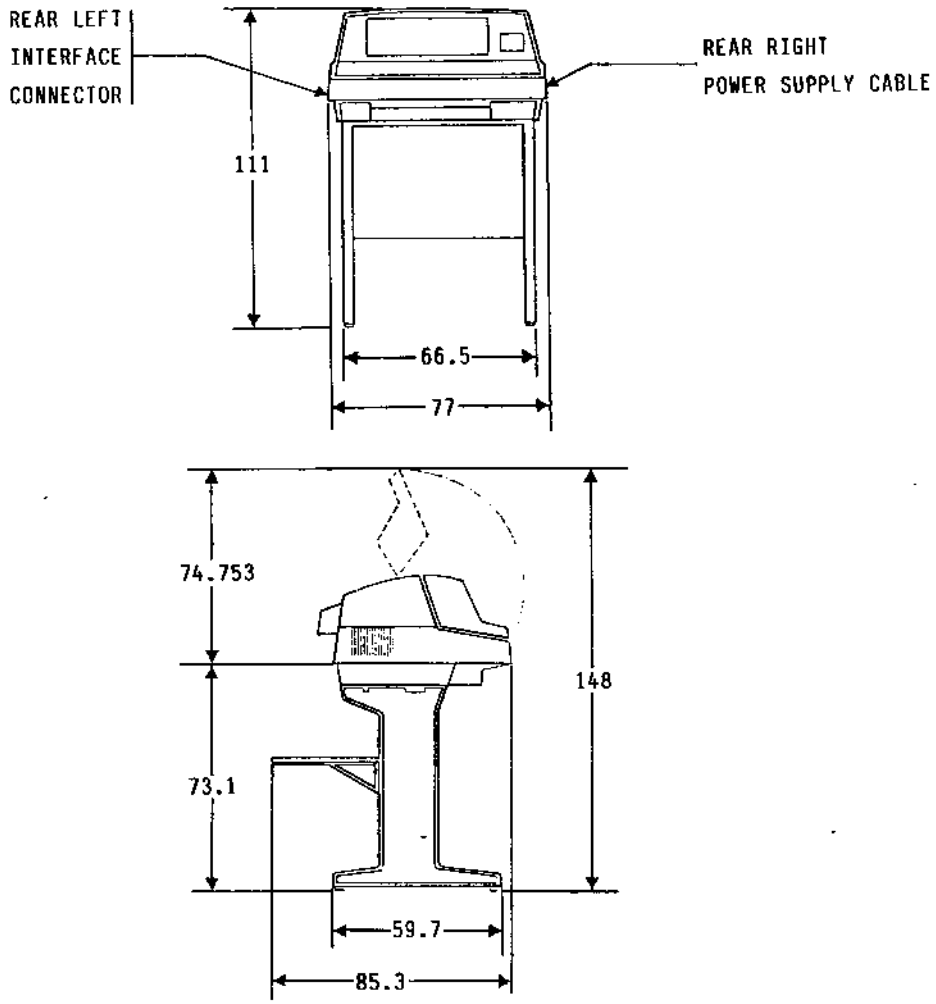


Figure 5-33 - Characteristics and dimensions of PR 3300/3600

Figure 5-33 - Characteristics and dimensions of PR 3300/3600

PR 340 PRINTER FOR WORD PROCESSING APPLICATIONS

Daisy-wheel printer at 25 ch/s, two way and 132 printing positions (0.1 in.).

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/H)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
110 115 120 220 240	50-60	58	50	12.8	10-40	15-85	0.25	

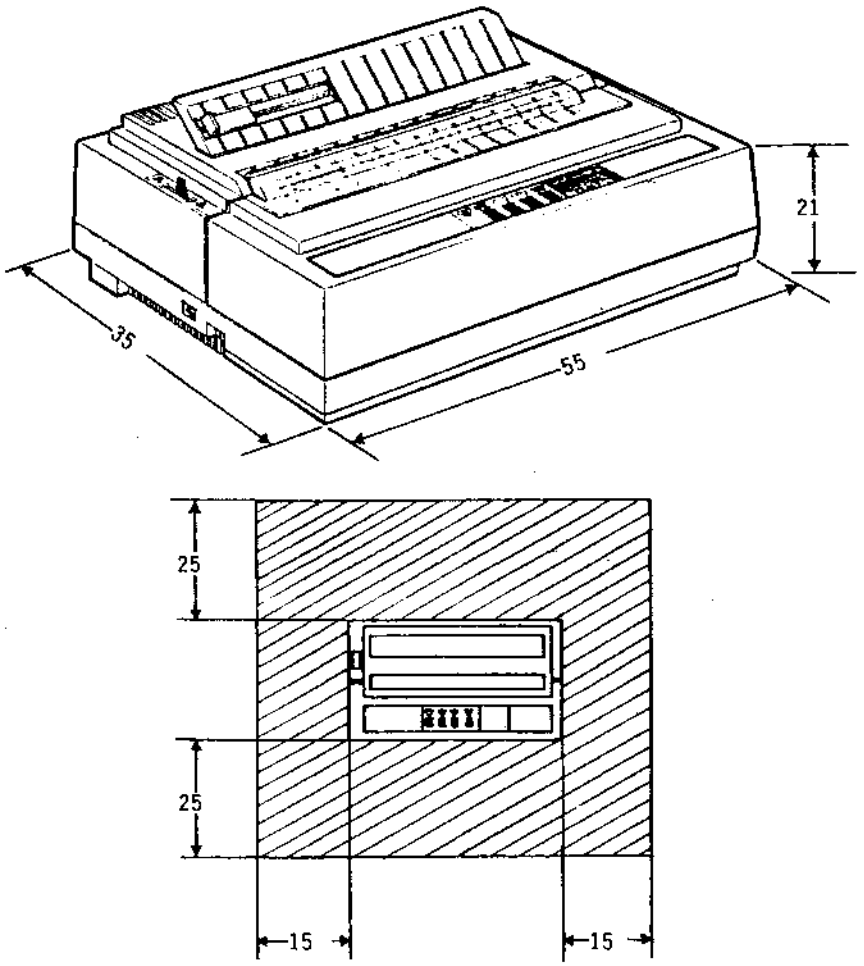


Figure 5-34 - Characteristics, dimensions and service area of PR 340

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/H)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
110 115 120 220 240	50-60	140	120	14.5	10-40	15-85		

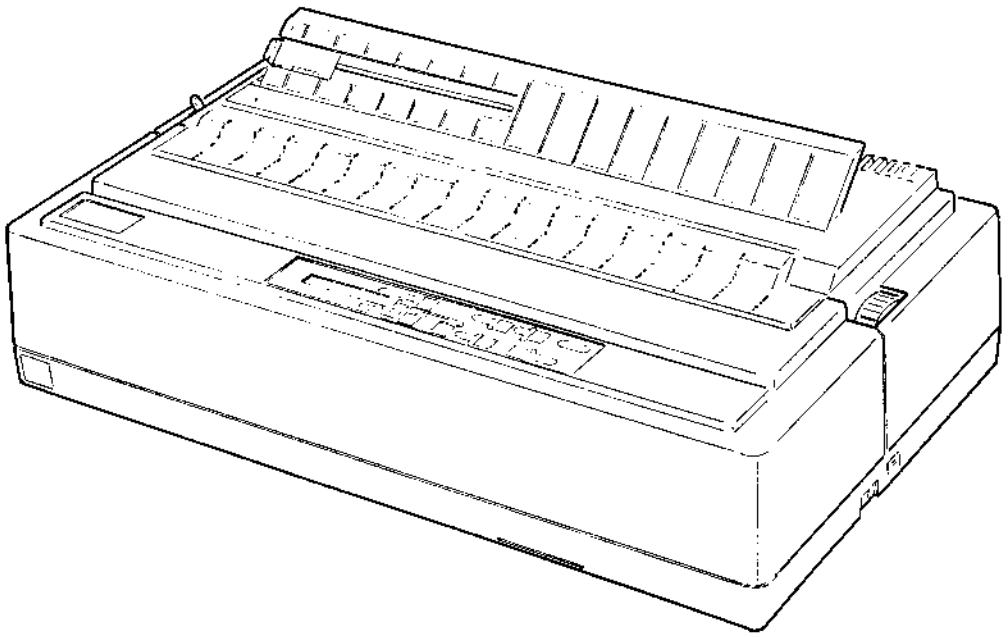


Figure 5-35 - Characteristics of DM 600

DM 286/2

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/H)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
100 115 220 240	50-60	70	60.5	7	15-35	15-85		

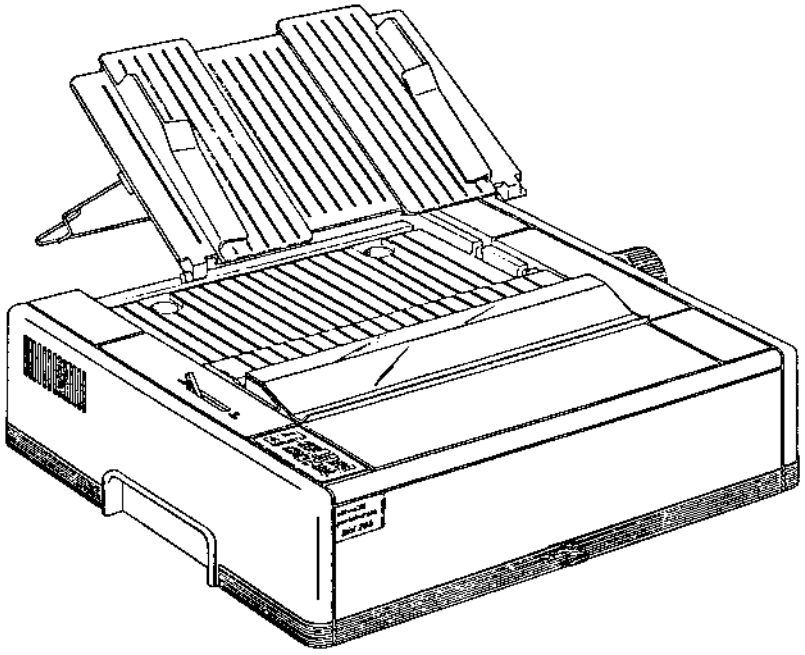


Figure 5-36 - Characteristics of DM 286/2

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/H)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
100 115 220 240	50-60	70	60.5	9	15-35	15-85		

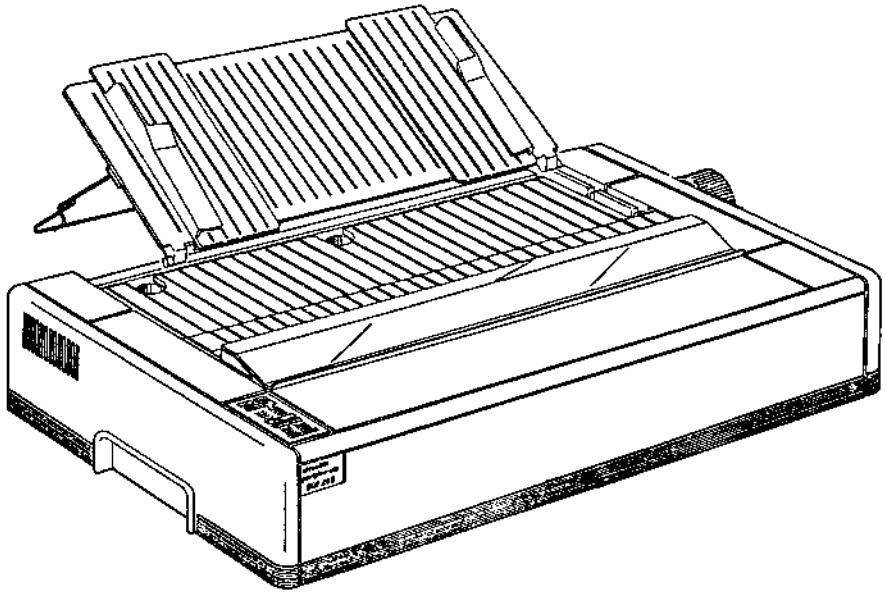


Figure 5-37 - Characteristics of DM 296

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/H)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
110 115 120 200 220 240	50-60	58	50	13.5	10-40	15-85	0.25	

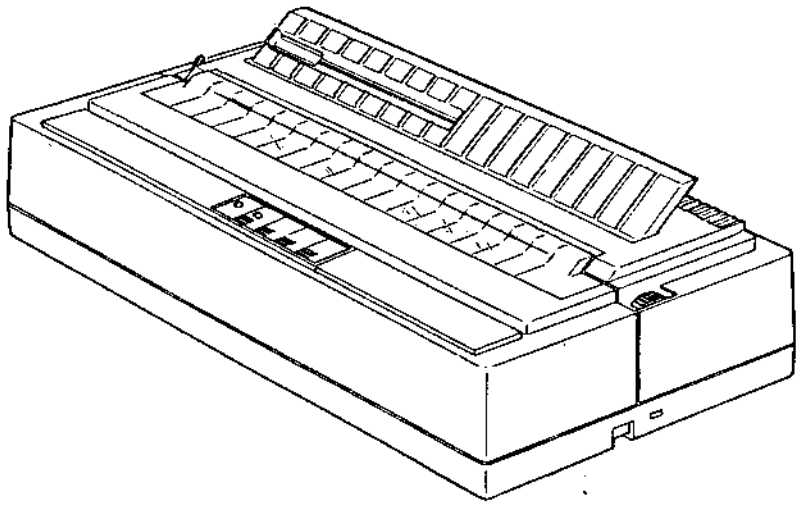


Figure 5-38 - Characteristics of DY 450

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/H)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
100 115 220 240	50-60	70	60.5	8.5	15-35	15-85		

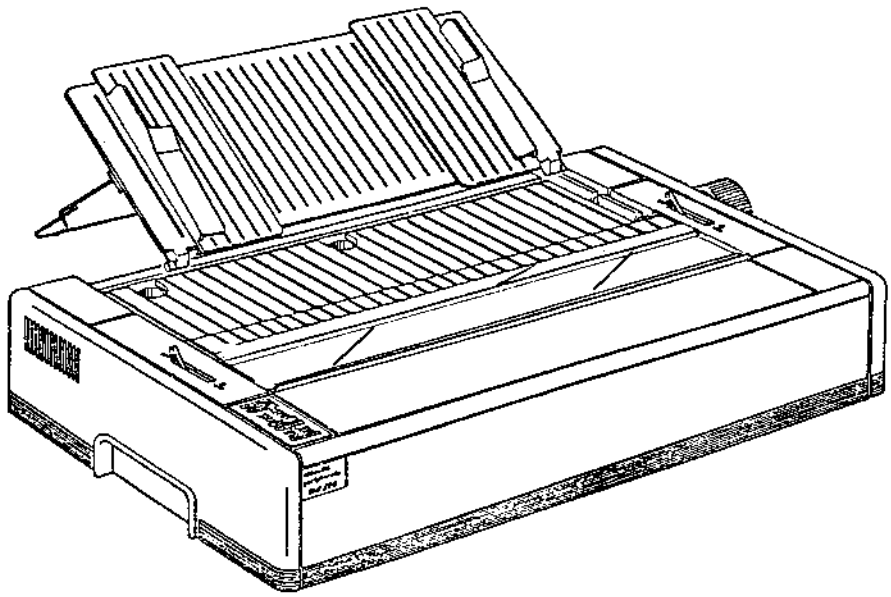


Figure 5-39 - Characteristics of DM 290

DM 280

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/H)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
100 115 220 240	50-60	70	60.5	6.5	15-35	15-85		

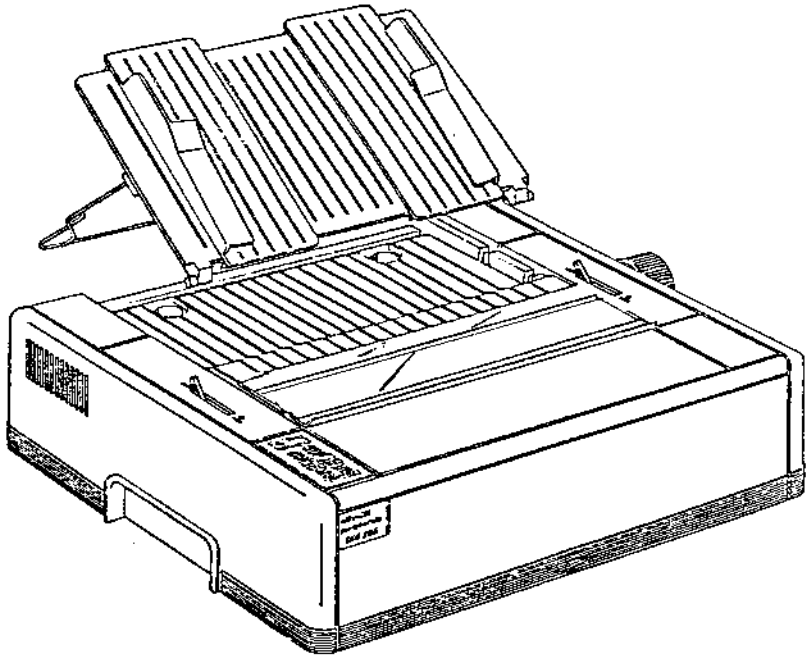


Figure 5-40 - Characteristics of DM 280

DY 800/2

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/H)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
100 115 220 240	50-60	70	60.5	13.5	10-40	15-95	0.25	

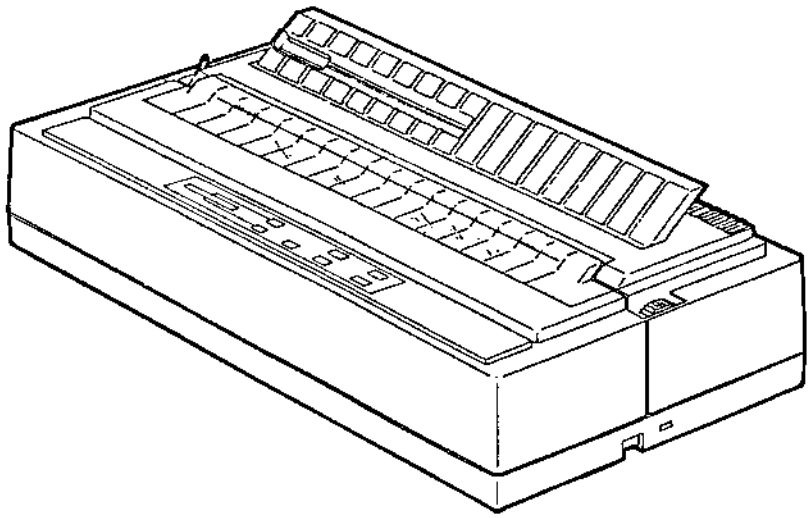
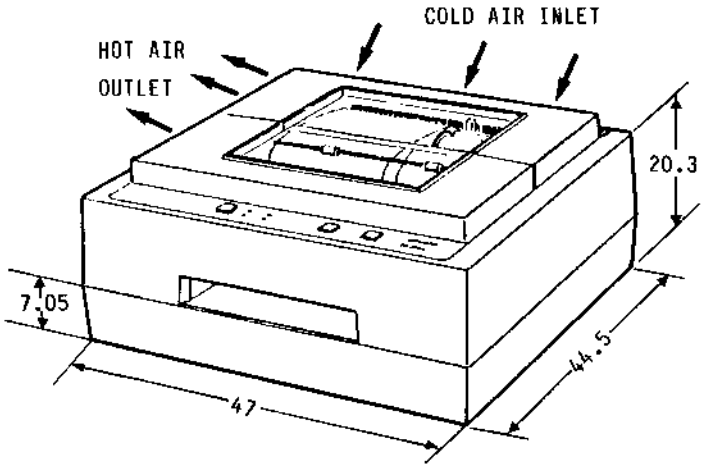
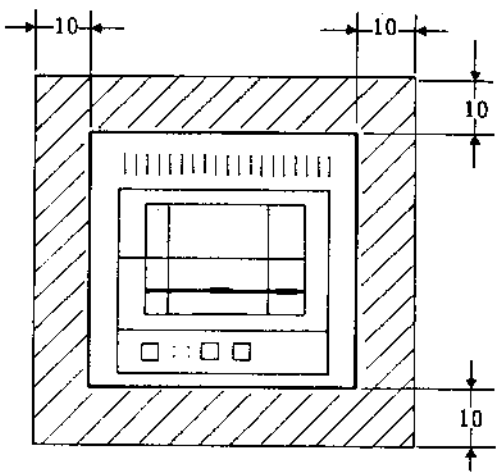


Figure 5-41 - Characteristics of DY 800/2

PR 2845 PRINTER FOR BANKING APPLICATIONS

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/H)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
110 115 120 220 240	50-60	41 (73 in print)	35	22	10-35	10-85	0.25	11





SERVICE AND VENTILATION AREA

Figure 5-42 - Characteristics, dimensions and service area of PR 2845

PR 2835 PRINTER FOR BANKING APPLICATIONS

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/H)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
110 115 120 220 240	50-60	60 (90 in print)	52	18	5-40	20-80	0.25	10

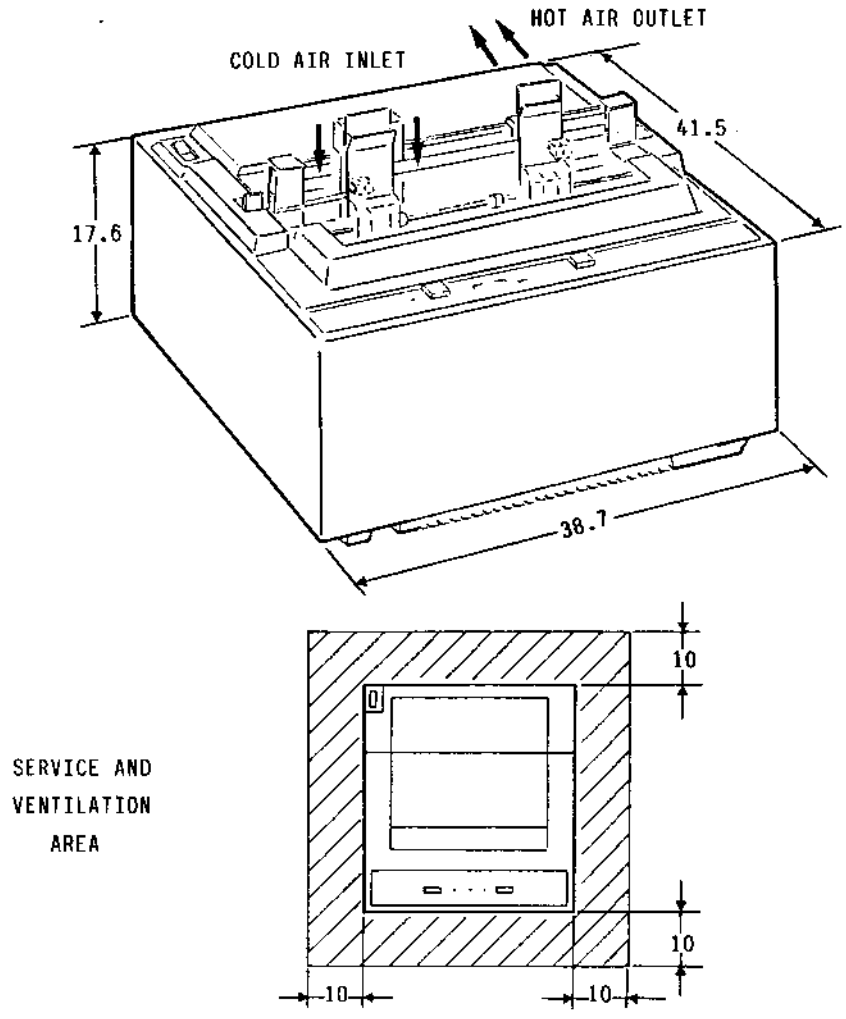
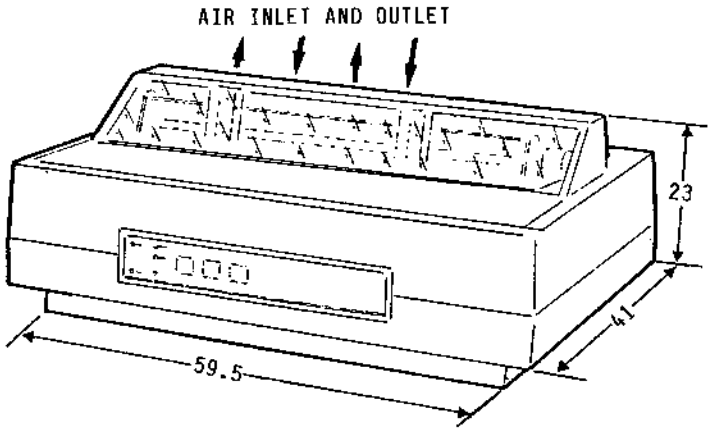


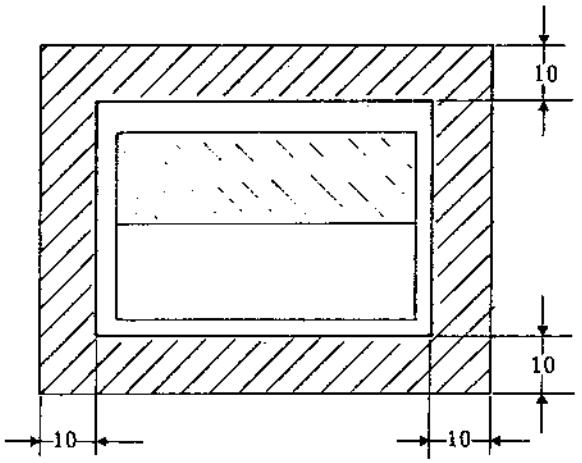
Figure 5-43 - Characteristics, dimensions and service area of PR 2835

PR 1480 GENERAL PURPOSE PRINTER

A matrix printer with ballistic head.

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/H)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
110 115 120 220 240	50-60	50 (110 in print)	43	16	10-35	10-85	0.25	





SERVICE AND VENTILATION AREA

Figure 5-44 - Characteristics, dimensions and service area of PR 1480

DM 400

VOLTAGE (V)	FREQUENCY (Hz)	POWER DRAIN (ac W)	POWER DISS. (Kcal/H)	WEIGHT (Kg)	OPERATING TEMP. (C)	R.H. (%)	DUST LEVEL (mg/m)	AIR FLOW (l/s)
100 115 220 240	50-60			16.5	10-40	15-95	0.25	-

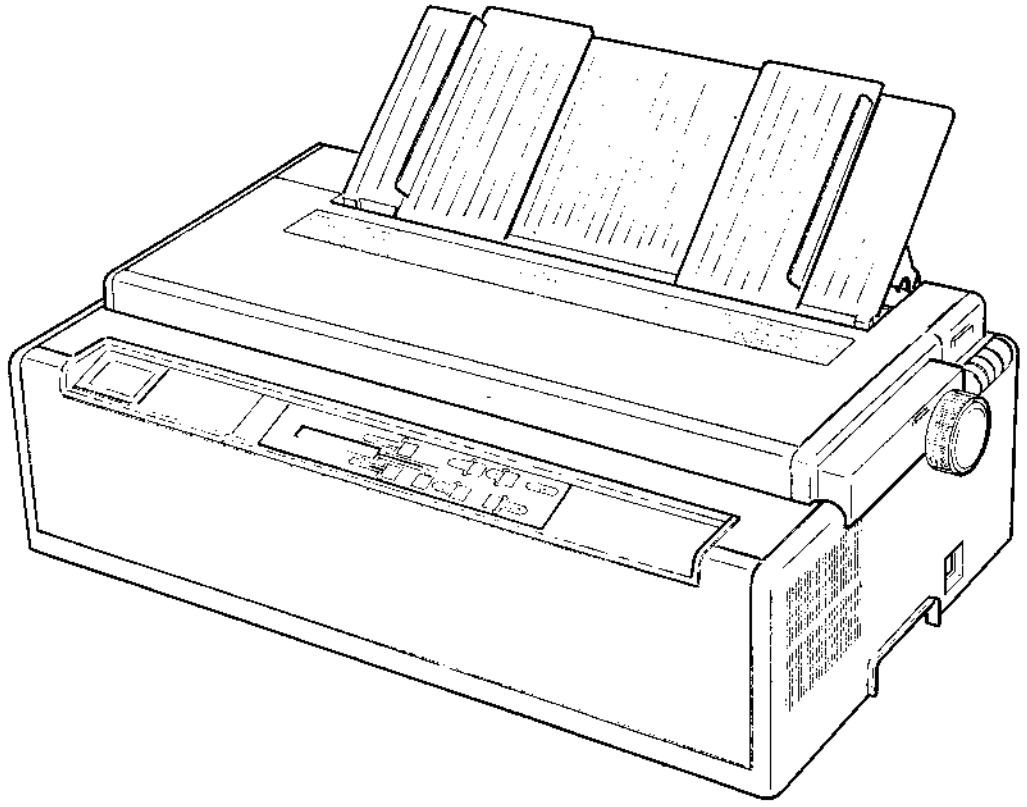


Figure 5-45 - Characteristics of DM 400

5.7 TYPES AND DIMENSIONS OF THE VARIOUS CABLES (in mm)

MODULE	CODE	COMMERCIAL NAME	LENGTH (m.)	EST. DIA. (mm.)	CABLE TYPE	NOTES
SERIAL INTERFACE MUX CABLE	337011 R	CBL 3378 CAV 149	3	8	single channel	
SERIAL INTERFACE MUX CABLE	337008 F	CBL 3378 CAV 147	3	7.4	single channel	
C.L. BRANCHING CABLE FOR ELB3683	111176 R	CBL 3610	10	5.1	single channel	
STD 13 RS 232 CABLE	335681 U	CBL 2657 CAV 062	2	6.9	single channel	
STD 13 RS 232 CABLE	335687 S	CBL 2658 CAV 065	3 3	6.9 6.9	twin channel	
STD 13 RS 232 CABLE	335664 A	CBL 2657 CAV 085	3	6.9	single channel	
STD 13 RS 232 CABLE	336239 H	CBL 2657 CAV 063	6.5	6.9	single channel	
A.S.D.	335539 V		1	6.9	single channel	
STD 13 MODEM TO RS 232 CABLE	335689 C	CBL 2658 CAV 066	3 3	6.9 7.3	twin channel	with ASD 3384

MODULE	CODE	COMMERCIAL NAME	LENGTH (m.)	EST. DIA. (mm.)	CABLE TYPE	NOTES
TWIN CHANNEL MODEM CABLE	335130 X	CBL 2658 CAV 064	3	7.3	twin channel	
MODEM EXTENSION CABLE	336519 S	CBL 3358 CAV 143	3	7.3	single channel	
MODEM CABLE	335132 M	CBL 2657 CAV 007	10	7.3	single channel	
MODEM EXTENSION CABLE	336520 X	CBL 3358 CAV 144	8	7.3	single channel	
CGA MODULE MATCHING CABLE	335541 X	CBL 2661	0.5	7.3	single channel	
MRW 1810 CABLE	334756 D	CBL 2659 CAV 067	1.5	8	single channel	
MBR 1932 PIN PAD CABLE	334861 X	CBL 2660 CAV 071	1.5 1.5	6.9 6.9	twin channel	
MBR 1932 CABLE	334875 V	CBL 2659 CAV 068	1.5	6.9	single channel	
PIN PAD CABLE	335521 K	CBL 2659 CAV 069	1.5	7.3	single channel	
MODEM CABLE (LCU 3376)	335109 F		3	8	single channel	with LCU 3376

MODULE	CODE	COMMERCIAL NAME	LENGTH (m.)	EST. DIA. (mm.)	CABLE TYPE	NOTES
MODEM CABLE (LPU 3348)E	336026 P		3	8	twin channel	with LCU 3348
LCU 3397 CABLE	336133 P		5	7.3	single channel	with LCU 3397
C.L. CABLE FOR REMOTE WORK STN.	5731315 Q		10 to 500	5.1	single channel	not with comml. module
LION 200 + V24 CABLE (LPU 3390)	336883 Q		3 5	6.7 8	twin channel	with LPU 3390
LCU X24 CABLE (LCU 3326)	336884 R		3	9	single channel	with LCU 3326
ULPC-MOIN 52 V24 INTERFACE CABLE	336885 J		0.45 5	8 7.3	twin channel	with LTU 3339
LCU 3345 CABLE	336898 X		2.5	8.2	single channel	with LCU 3345
ETHERNET LINE DROP CABLE	336935 K	CBL 3392	10	9.5	single channel	
ETHERNET LINE DROP CABLE	337909 B	CBL 3391	5	9.5	single channel	
MUX CABLE	963225 Y		5	8.5-17	single channel	

MODULE	CODE	COMMERCIAL NAME	LENGTH (m.)	EST. DIA. (mm.)	CABLE TYPE	NOTES
VIDEO / KEYBOARD CABLE	335091 Q		1.1 2	8.8 7.4	twin channel	with vid kbd ctlr
VIDEO / KEYBOARD CABLE	336243 D		3.5 3.5	8.8 7.4	twin channel	with vid kbd ctlr
VIDEO / KEYBOARD CABLE	335117 N		3.5 3.5	8.8 8.8	twin channel	with vid kbd ctlr
VIDEO / KEYBOARD CABLE (COLOUR)	336012 R		1.1 2	8.2 7.4	twin channel	with vid kbd ctlr
VIDEO / KEYBOARD CABLE (COLOUR)	336014 K		3.5 3.5	8.2 7.4	twin channel	with vid kbd ctlr
VIDEO / KEYBOARD CABLE (COLOUR)	336240 N		5.6 6.5	8.2 7.4	twin channel	with vid kbd ctlr
ETHERNET LINE DROP CABLE	337910 X	CBL 3393	20	9.5	single channel	
DROP CABLE EXTENSION	337915 Q	CBL 3394	30	9.5	single channel	for ETHERNET
MSW MATCHING CABLE	336923 P		0.2	8	single channel	with MSW 3369
ELB 1381/2 CABLE (COLOUR)	336030 X	CBL 2614	15	8.2	single channel	

MODULE	CODE	COMMERCIAL NAME	LENGTH (m.)	EST. DIA. (mm.)	CABLE TYPE	NOTES
ELB 1381/2 CABLE (COLOUR)	336031 L	CBL 2624	25	8.2	single channel	
ELB 1381/2 CABLE (COLOUR)	336032 M	CBL 2649	50	8.2	single channel	
ELB 1381/2 CABLE (COLOUR)	336881 N	CBL 2698	100	8.2	single channel	
MRW 1810 PIN PAD CABLE	334728 H	CBL 2660 CAV 070	1.5 1.5	8 7.2	twin channel	
STD 13 RS 232 CABLE	969797 C	CBL 3657 CAV 062	2	6.9	single channel	
STD 13 RS 232 CABLE	969801 H	CBL 3657 CAV 085	3	6.9	single channel	
STD 13 RS 232 CABLE	969799 N	CBL 3657 CAV 063	6.5	6.9	single channel	
STD 13 RS 232 CABLE	969805 D	CBL 3658 CAV 065	3	6.9 6.9	twin channel	
STD 13 MODEM TO RS232 CABLE	969807 F	CBL 3658 CAV 066	3	6.9 7.3	twin channel	
PERIPHERAL MATCHING CABLE	336868 G	CBL 3349	0.2	8.2	twin channel	If not STD 13, only to modem cable

MODULE	CODE	COMMERCIAL NAME	LENGTH (m.)	EST. DIA. (mm.)	CABLE TYPE	NOTES
LCPU/MOIN52 V24 INTERFACE CABLE	337916 R	CAV 150			twin channel	with LTU 3395
LCPU/MOIN52 V24 INTERFACE CABLE	337917 J	CAV 151				with LTU 3395
ST 506 INTERFACE COMMAND CABLE	967482 P	CBL 7049 CAV 179 CAV 180				
ESDI INTERFACE COMMAND CABLE	963278 M	CBL 7059 CAV 181 CAV 182				
DUAL PORT 275 MB HDU CABLES	967488 V	CBL 7093 CAV 185 CAV 186				
ELB 3683 C.L. BRANCHING CABLE	967559 B	CBL 7090	10			
MALE PERIPHERAL SIDE SERIAL CABLE FOR D-BOX CONN.		CBL 3379	3			
UNATTENDED FEATURE CABLE		CBL 7094				
LION 9.6 V24 INTERFACE CABLE	964056 T					with LPU 3398
SMD INTERFACE COMMAND CABLE						

6. WORK STATIONS

The work stations for the NL1 system can be connected via a KDC controller or a MUX.

The work station connections are as follows:

A) LOCAL WORK STATIONS

At up to 5 meters, direct connections are made between the controller, the keyboard and the video, without using an electronic box (Minibox).

B) WORK STATIONS CONNECTED WITH THE ELB 1381 - ELB 1382

At up to 100 meters, it is necessary to use a Minibox which, apart from its function of supporting the video, contains a power supply and a board to regenerate the keyboard/video signals.

The ELB 1382 box can process two serial interfaces and a badge reader, plus a pin-pad.

C) WORK STATIONS CONNECTED WITH THE ELB 3683

At up to 1000 meters, a Minibox is still used, with the same characteristics as above but which is connected in a current loop.

D) WORK STATION CONNECTED WITH THE ELB 3684

The ELB 3684, apart from the same features as the ELB 3683, allows work stations to be connected via inter-building lines using modems and ECC controllers or static multiplexes.

Further details of these connections will be described in the next updating of this document.

6.1 POSSIBLE CONTROLLER CONFIGURATIONS

A) KDC CONTROLLER (controller for video/keyboard)

Over and above the limits determinable from calculating the current drain, the following configurability limits apply:

1. M54/M64/M70

   A maximum of eight monochrome KDCs, of which a maximum of four can be MEGs for graphic expansion.

B) POSSIBLE NUMBER OF MULTIPLEXES

1. M54 - Configuration is planned with one multiplex.

2. M64 - Configuration is planned with a maximum of eight multiplexes.

3. M70/2/3 - Configuration is planned with a maximum of eight multiplexes.

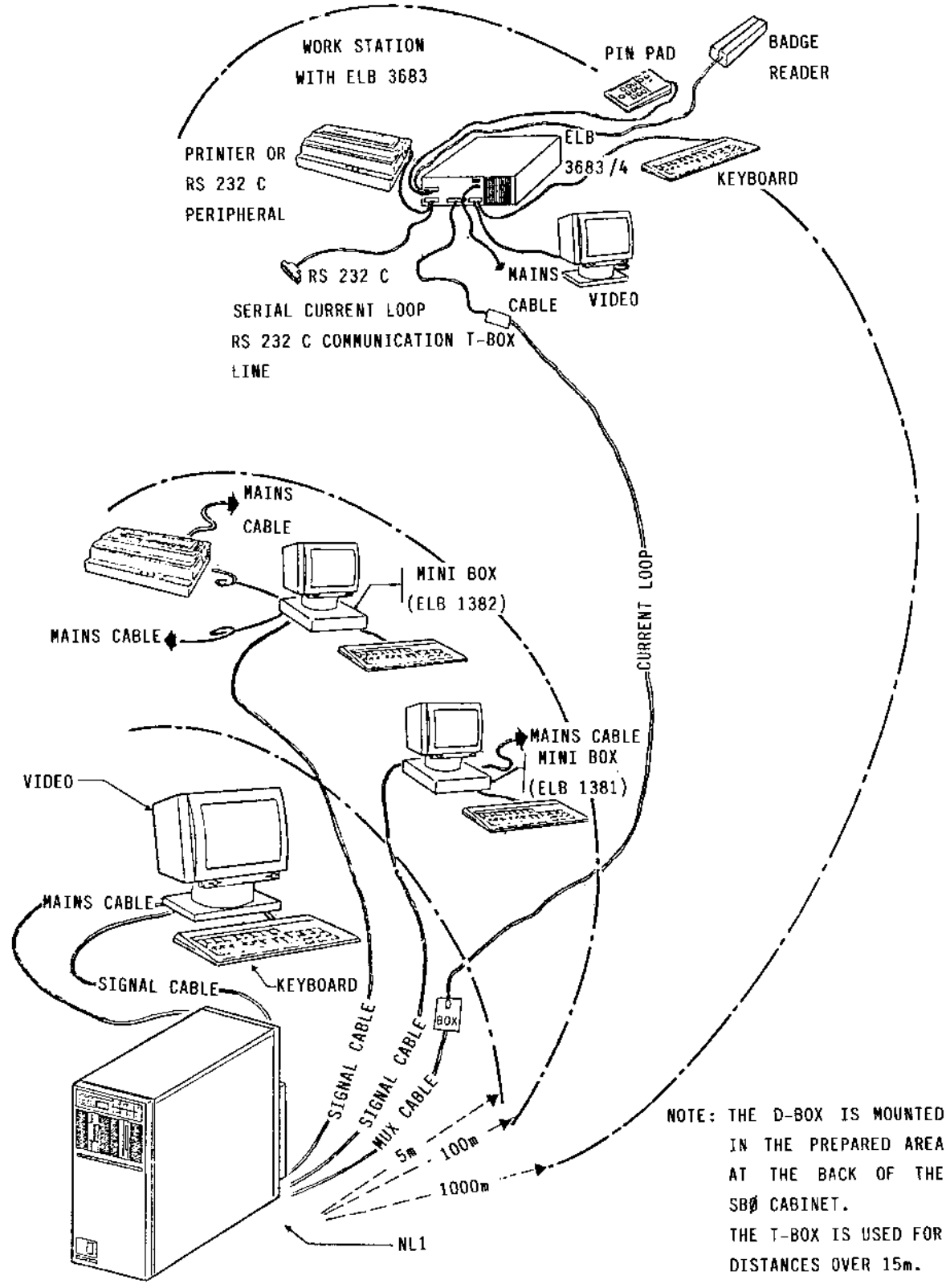


Figure 6-1 - Connection distances for NL1 system work stations

6.2 ELB XXXX CONNECTION CABLES

6.2.1 CABLES CONNECTING THE NL1 TO THE ELB 1382/81

Connection between the work station (ELB 1381/82) and the keyboard/video controller, inserted in the NL1 cassette rack, is effected with the following cables:

- Remote black/white video cable, 7.7 mm diameter.
- Remote colour video cable, 9.6 mm diameter (can also be used with a b/w video).

These cables are handled as finished products and are available at the standard lengths of 15, 25 and 50 meters. If it is necessary to construct such a cable in the field with the exact length needed for the installation (maximum distance between the work station and the machine is 100 m) the connectors and the cable can be ordered from "Gestione Ricambi", stating the codes and the length required. The GR codes are:

5715250 P - Black/white video cable
5715288 Z - Colour video cable.

For other spare parts, see the NOP coded 3874208 Z 03.

It is inadvisable to purchase this cable locally.

6.2.2 CABLES CONNECTING TO THE ELB 3683/4

Connecting between the regeneration signalboard, inserted in the ELB, the keyboard and the video is effected using the same cables as foreseen for the connection of thismodule to the system, when the distance is less than 5 meters.

6.2.3 CABLES CONNECTING THE ELB 1382/81 TO PERIPHERALS

Connections between this new work station and the MUX controller are made with a series of three cables:

1. MUX cable - connects the MUX to the D-BOX, 5 meters long.
   This is supplied with the D-BOX, module DBX 3389.
2. CBL 3610 - 10 meters long connecting an ELB 3683 to a D-BOX/T-BOX.
3. C.L. Quad cable - Connects the D-BOX to the T-BOX.
   This cable can be ordered from "Gestione Ricambi" in skeins of 500 meters, Olivetti code 5731315 Q.
4. In the next updating of this document, technical details will be supplied on the types of modem, ECC controller and static multiplex which can be used for the ELB 3684 inter-building connections.

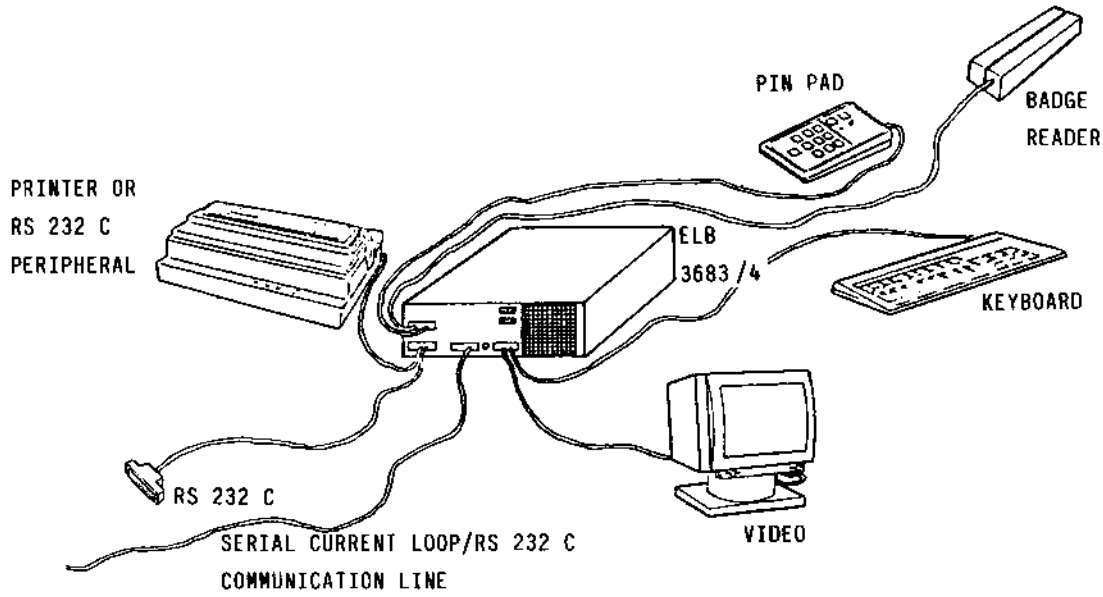


Figure 6-2 - Connection between ELB and peripherals

6.2.4 DISTRIBUTION BOX (D-BOX) AND T-BOX INSTALLATION

The D-BOX is a passive device connecting the multiplex controller in the system to the various peripherals used, i.e. it distributes the connections (RS 232 and/or current loop) among the peripherals.
It is mounted on a frame (at the back of the SBO cabinet) which can take up to eight D-BOXES.
In addition, the D-BOX has a cable about 30 centimeters long which is connected to the terminal strip of the MUX board.

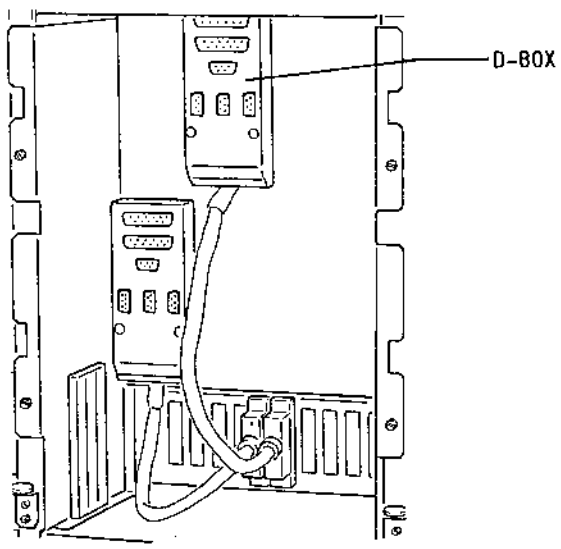


Figure 6-3 - View of D-BOX frame on SBO cabinet

Installation of the T-BOX

The T-BOX is located at a maximum distance of ten meters from the ELB 3683 and is fixed to a wall or the floor with expanding sleeve screws.

The hole diameter for these screws is 4.5 mm and the distance between centres is 49 mm.

The T-BOX can be fixed only after opening the cover and removing the printed circuit as shown in Figure 6-4.

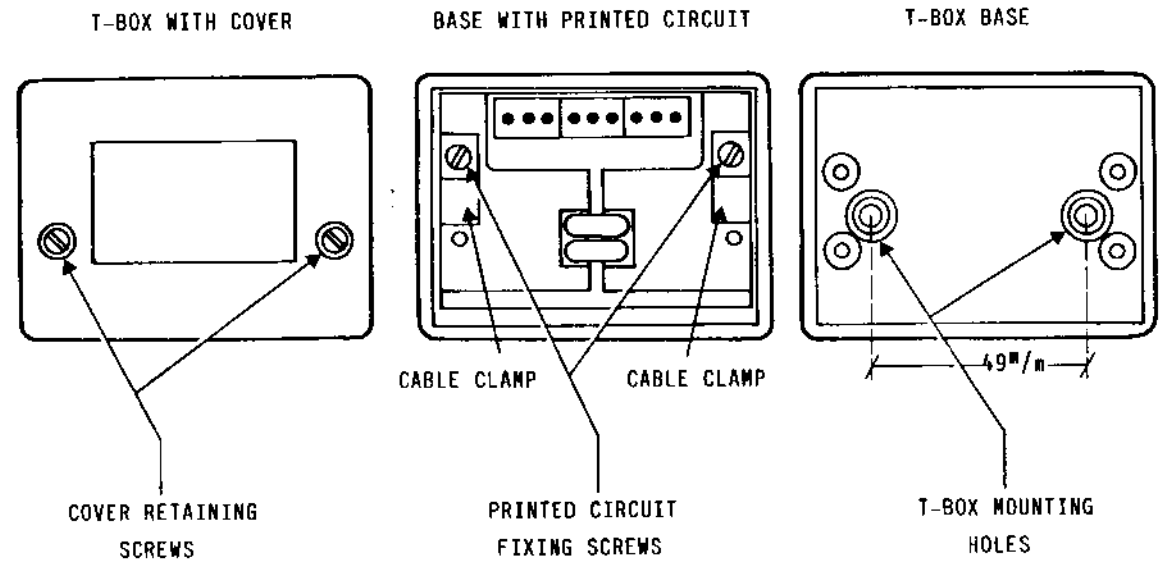


Figure 6-4 - Disassembly of the T-BOX

6.2.5 INSTALLING WORK STATION SIGNAL CABLES

These cables must not be installed close to high power electronic equipment which could provoke damaging interference.

The most common interference generators are:

- Lighting plants of any type.
- Power and distribution generators such as transformers, alternators and motors (air conditioners, lifts, ventilators, etc.).
- Radio and television transmitters.
- Signal generators, intercommunication devices and alarm systems.

Interference on the cables also depends on the length of line running parallel to the interference source.

The following table indicates the minimum distances between any cable and a source of interference.

DISTRIBUTION NETWORK	MINIMUM DISTANCE BETWEEN CABLE AND INTERFERENCE SOURCE
Less than 2 KVA	0.10 meters
From 2 KVA to 5 KVA	0.30 meters
More than 5 KVA	0.50 meters

When cables cross at 90 degrees, the minimum distance can be 0.10 meters.
The cables must also be protected from mechanical scuffing.
If a cable runs vertically, it must be anchored to supports at intervals of not more than one meter.

IMPORTANT NOTES:

1. To facilitate servicing, it is necessary to arrange installation of one work station in line of sight from the BOX or cabinet. This work station, apart from its normal use, will function as a system console at which information relating to functioning of the whole system will be entered in the diagnostics phase.

2. In work station connections without an ELB, the a.c. supply to the video is directly from the BOX or the cabinet. In other cases, the video is supplied from the ELB.

6.2.6 EXTERIOR ROUTES BETWEEN BUILDINGS

All connections via an ELB (apart from the ELB 3684) must only be internal. In fact, exterior routes are not permitted for the following cables:

Code 5715288 Z	Black/white and colour
Code 5731315 Q	Current loop

To meet the requirements of a few installations, there can be a need for short exterior runs. In such cases, the following minimum protection must be applied against atmospheric conditions:

1. Underground runs in inter-network conduits (at least 30 cm below ground).

2. Runs in tubular metal conduits which are grounded at each end.

   The cross-section of the metal in the tubes must be of not less than 50 sq. mm (tube diameter of 19 mm or more). The ground connections must be with a cable of 35 sq. mm (as for lightning conductors).

   A good continuity at low resistance must be ensured for any joints in the tubes.

In addition, the sealing of joints against the entry of water, as normally followed for electrical installations, must be followed. This is also valid for underground runs.

6.2.7 NL1 INSTALLATION TOPOLOGY WITH NEW ELB 3683/4 WORK STATIONS IN LOCAL AND REMOTE ENVIRONMENTS

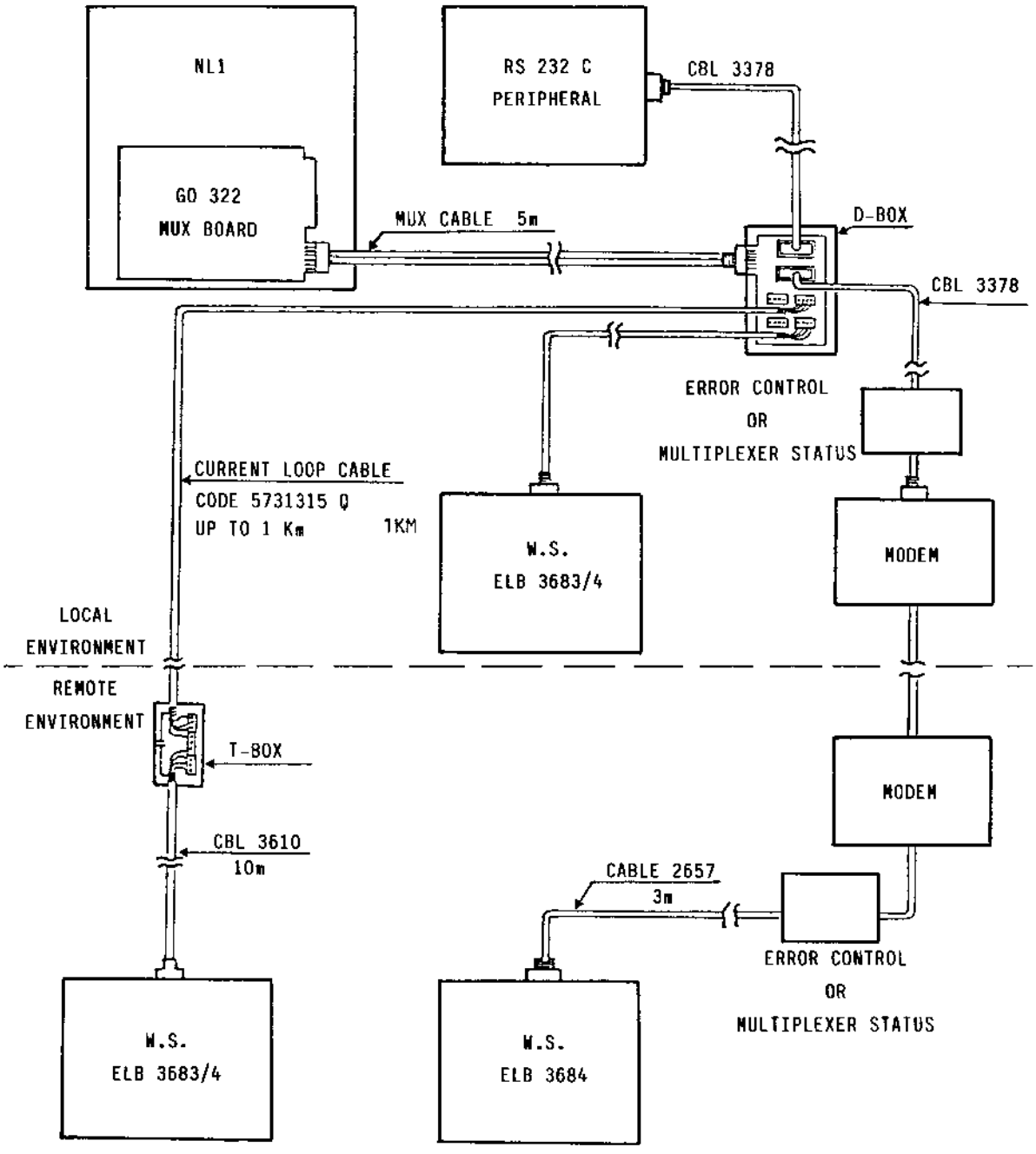


Figure 6-5 - Work station installation scheme

6.2.8 CURRENT LOOP CABLE (ELB 3683/4)

DESCRIPTION

This is a flexible quad screened cable made up from four conductors of tinned electrolytic copper, insulated and inserted in a screening sleeve and a grey insulating sheath.

CHARACTERISTICS:

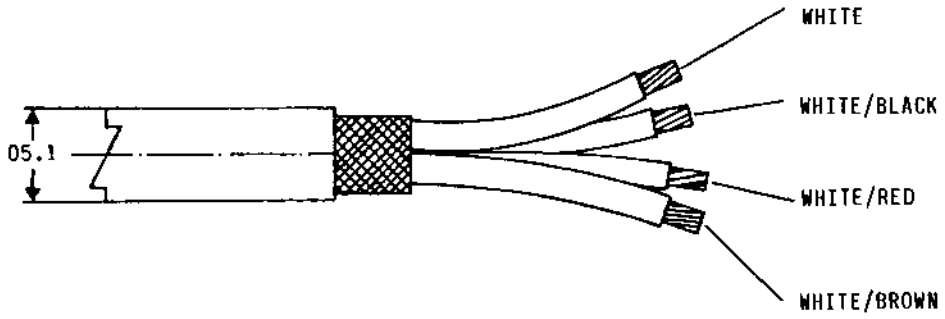
Electrolytic copper : Cu - ETP UNI 5649

Resistivity : 0.017094 ohms sq.mm/m

Style : 2448

Approval : UL

CODE	IND.
5731315 Q	



If it is necessary to join the current loop cable, the recommended method is as follows:

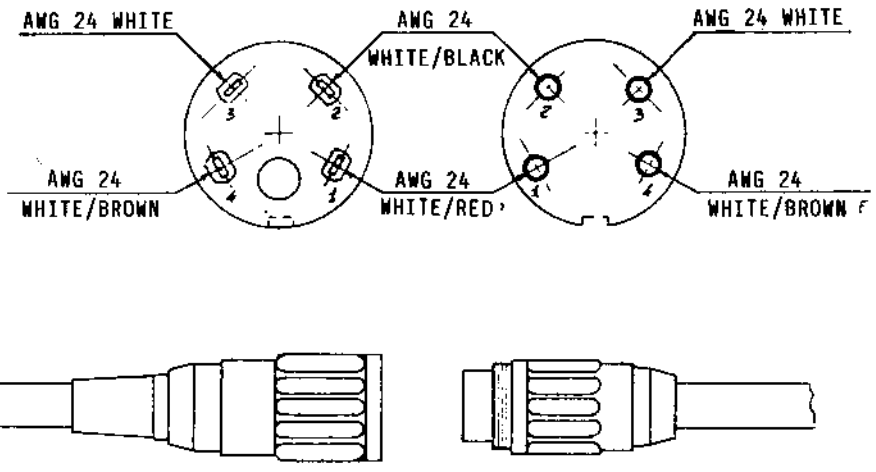


Figure 6-6 - Current loop cable

7. LINES FOR NL1 CONNECTIONS

The systems making up the NL1 product line have been developed for the logic of distributed data processing. In this aspect, various system connection possibilities have been taken into account to obtain entensive and powerful configurations.

The types of connections existing up to now are:

1. Internal line with an integrated MOIN modem.

2. External line with a V24 controller.

3. Internal line with a LION 9.6 controller.

4. Internal line with a LION 200 controller.

5. Local OMNINET network.

6. Local ETHERNET network.

To obtain the best operational capability of the interconnected systems, it is necessary first to make an accurate analysis for a correct definition of the installation.
In particular, pay careful attention to the sources of interference as listed below:

- Electric lighting systems (particularly with fluorescent lamps).

- Generating systems and power distribution systems, such as transformers and alternators.

- Motors for air conditioners, lifts and large ventilators.

- Radio and television transmitters.

- Signal generators, intercommunication systems and alarm systems.

Another feature which affects the level of noise in the line is the length of run parallel to sources of interference.

The table on the next page furnishes indicative values for the separations between line cables and sources of interference related to their parallel runs.

LENGTH OF PARALLEL RUN	MINIMUM LINE TO INTERFERENCE SOURCE DISTANCE
0 to 100 m	0.10 m
> 100 m	0.30 to 0.50 m

NOTE: In cases of 90 degree crossings between the line cable and the a.c. cable, the minimum distance becomes 0.05 m.

It is also necessary to ensure efficient mechanical protection in particularly exposed parts of the installation, for example where the cable passes across a passage of any type. In such cases, use of conduits is advisable.

The descriptions above are recommendations for laying any type of backbone structure. For any particular rules applying to a particular type of line, refer to the specific chapter.

7.1 INTERIOR LINE CONNECTIONS WITH MOIN INTEGRATED MODEM

7.1.1 CABLES FOR INTERIOR LINES (LCU 3327 / LTU 3339)

INTERNAL / LOCAL work stations are connected to lines with a maximum distance of 4 Km, using integrated modems. For these connections, cables of the twisted telephonic pair, shielded or not, can be used with the following characteristics taken into account:

Screened flexible and insulated cable, made up from a twisted pair, with an uninsulated conductor contacting the screen for continuity.

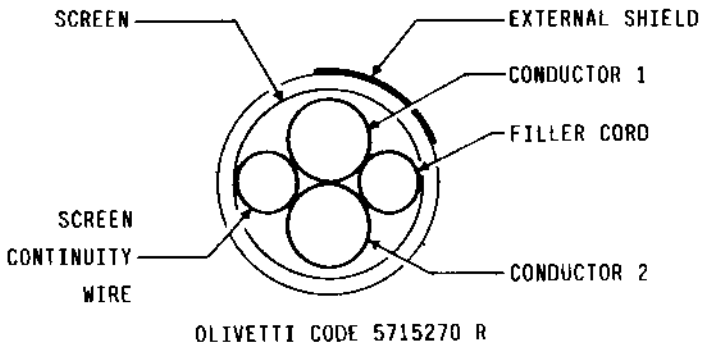


Figure 7-1 - Shielded twisted telephone pair

Mechanical characteristics

The shield is an aluminised polyester tape, helix wound with at least 10% overlap at the edges. The continuity wire is in AWG 22 (0.65 mm diameter) tinned copper and the conductors are each 7 x AWG 30. The external sheath is in PVC of a colour and finish still to be defined, with a nominal thickness of 0.89 mm, Shore hardness A80 $\pm$5, 200% minimum stretch, an elastic modulus of 2000 PSI and a minimum local thickness of 0.76 mm.

The cable must be wound on a 25 mm diameter drum for one complete turn (environmental temperature of 15 to 35° C) without damaging the conductors or insulation.

External diameter is 6 mm maximum.

Conductors 1 and 2 are in tinned copper, AWG 22 section with 7/30 stranding, polythene insulation of 0.23 mm average thickness,to specification UL 300 V, 80 C. The filler cord is needed to maintain the circular section of the cable.

Electrical characteristics

Resistance of one conductor at 20°C, f = 1 KHz: R $\leq$60 ohm/Km

Capacity between the two conductors ar 20°C, f = 1 KHz: C $\leq$0.060 uF/Km

7.1.2 CABLES SUPPLIED BY THE CUSTOMER

In cases where it is necessary to install the line cable near equipment or supply lines subject to heavy transient loads causing radiated electrical interference, it is advised to use screened cable with the characteristics described above.

When the line installation is not in an environment with electrical interference sources, it is sufficient to use a normal telephone pair, unscreened, consisting of two twisted conductors.

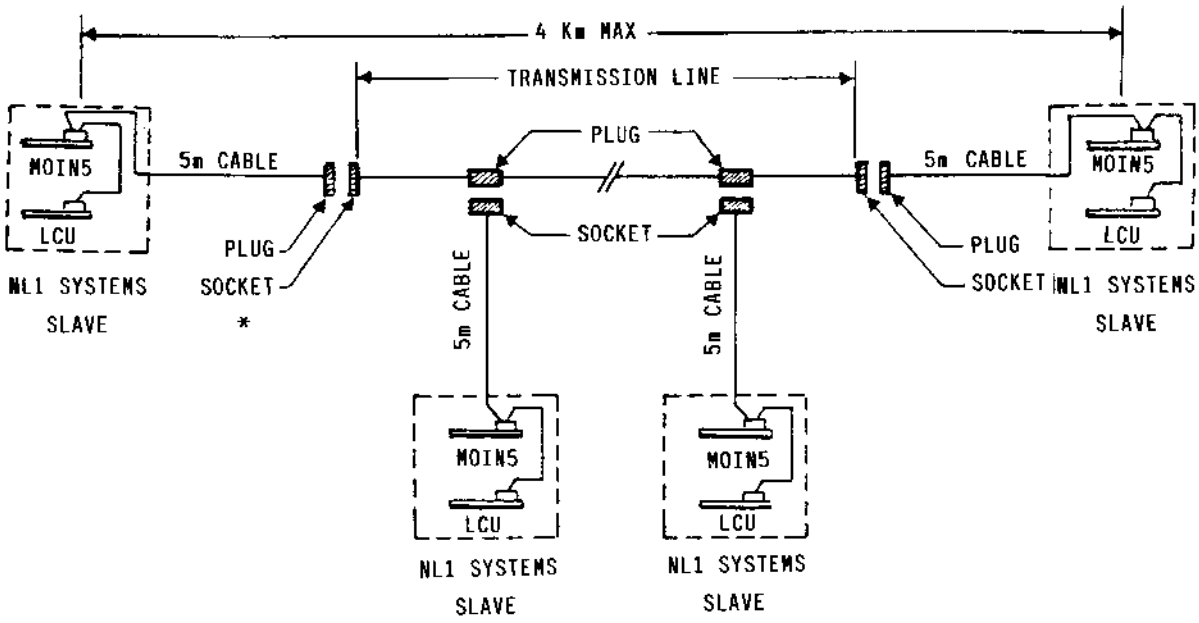
The connection between the MOIN 5.2 cable and the transmission line is made with AKERMANN connectors. In cases of multipoint connections, it is necessary to fit a termination resistor of 150 ohm 0.125 W.

The following table (A) shows the cases where it is necessary to use cables with and without screening and whther the termination resistor is needed.

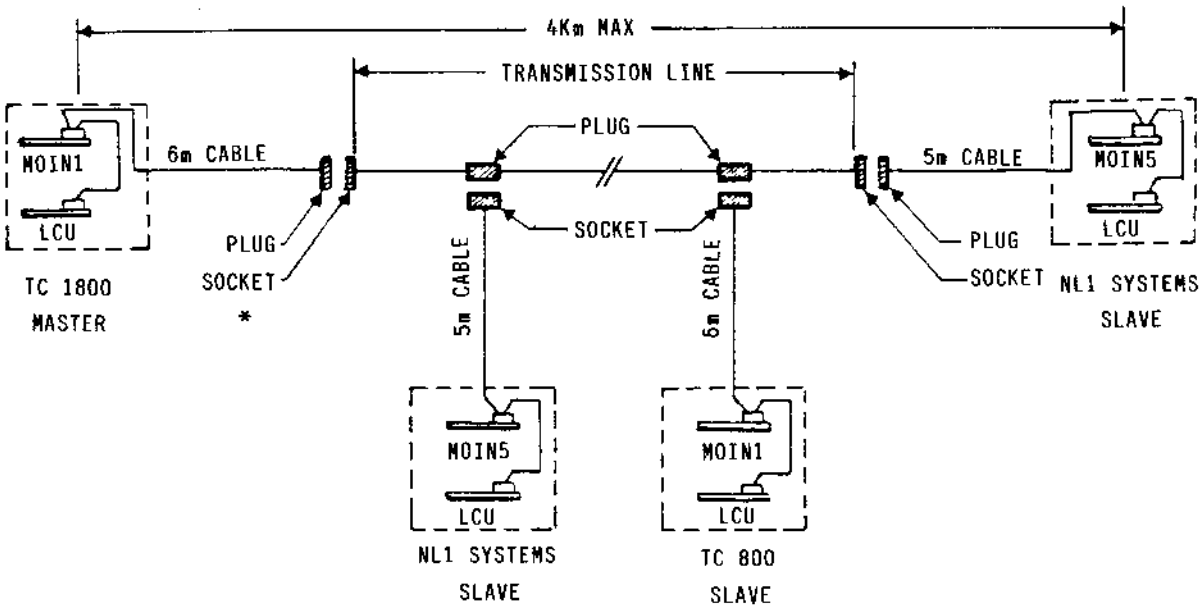
TYPE OF CONNECTION				TELEPHONE PAIR		150 ohm 1/8 W TERMINATION RESISTOR ON LAST BRANCH
POINT TO POINT		MULTI-POINT		WITH SCREEN	WITHOUT SCREEN	
NL1/TC 1800 TC 800	NL1/NL1	NL1/TC 1800 TC 800	NL1/NL1			
X	-	-	-	YES	NO	INDISPENSABLE, ONLY ON TC 1800/ TC800 SIDE
-	X	-	-	YES	YES	
-	-	X	-	YES	NO	
-	-	-	X	YES	YES	

Examples of Multi-point connections

NL1 - NL1



TC 1800 - NL1



* THE PLUGS AND SOCKETS ARE THE AKERMANN TYPE

Figure 7-2 - Multi-point connections

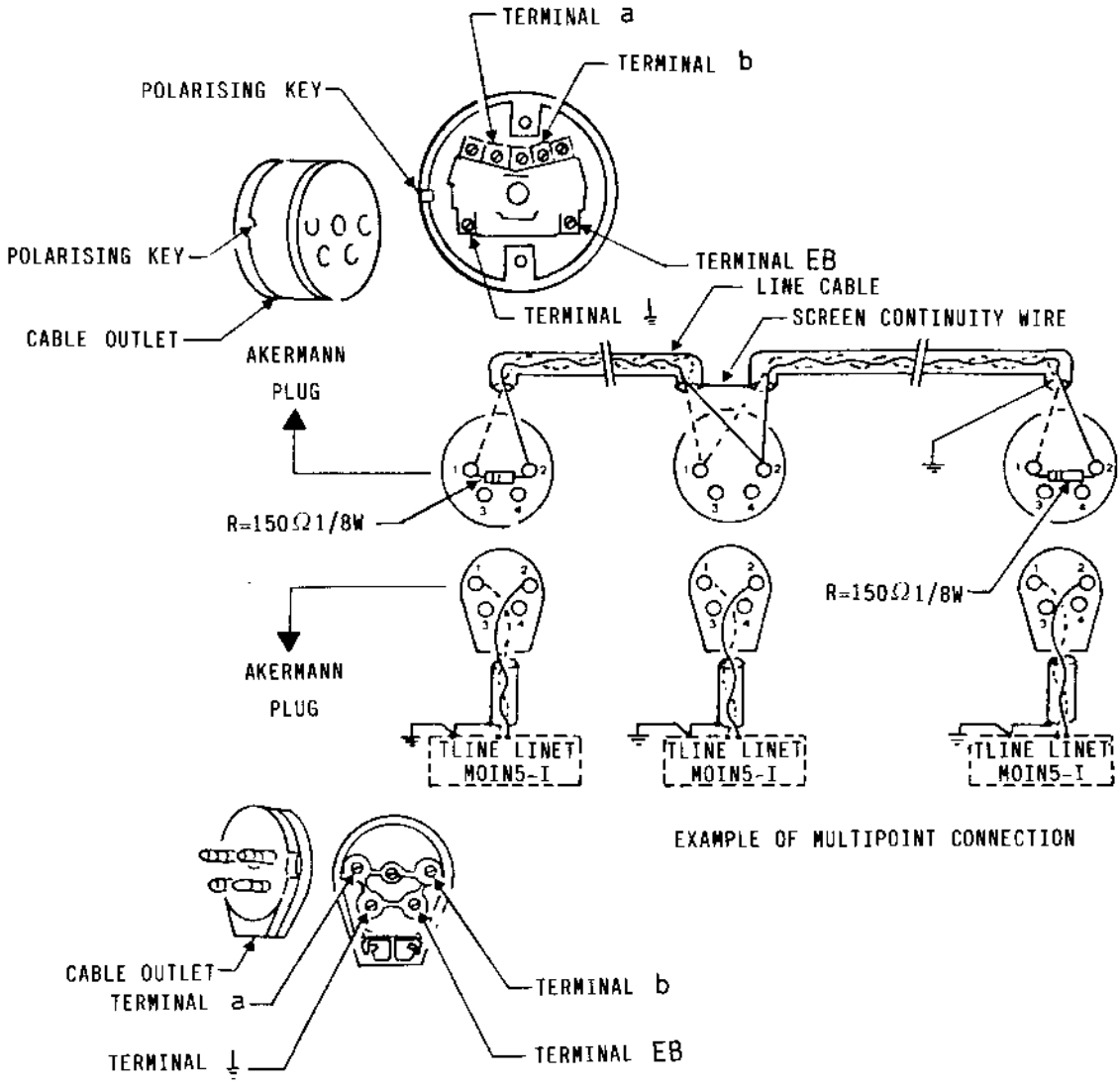


Figure 7-3 - Example of Akermann plug and socket connections

For installation, it is necessary to connect:

- The white wire shown in Figure 7-3 as a dotted line ("TLINE" logic signal) to terminal a.
- The black/white wire shown in Figure 7-3 as a continuous line ("LINET" logic signal) to terminal b.
- In Multi-point connections, the termination resistor "R" must be inserted in the last Akermann sockets and the continuity of the cable screen must be confirmed.

7.2 CONTROLLED EXTERIOR LINES WITH V24 AND X24 INTERFACE

This type of connection allows communication between systems located at large distances apart in that it allows connection via modems and thus via the telephone network.

The modules used at present on the M54/64/70 are:

LCU 3326	X24
LCU 3376	Fast V24
LPU 3348	2 x V24
LPU 3390	LION 200 + V24
LPU 3398	LION 9.6 + V24

The means of transmission does not present any problems in that the controller connects directly to the modem and the cable is supplied with the controller itself.

7.2.1 CONNECTING REMOTE INTERIOR AND EXTERIOR LINES

This type of connection is for when the SLAVE is located at a greater distance than 4 Km. In such a case, telephone lines and an external modem are used.

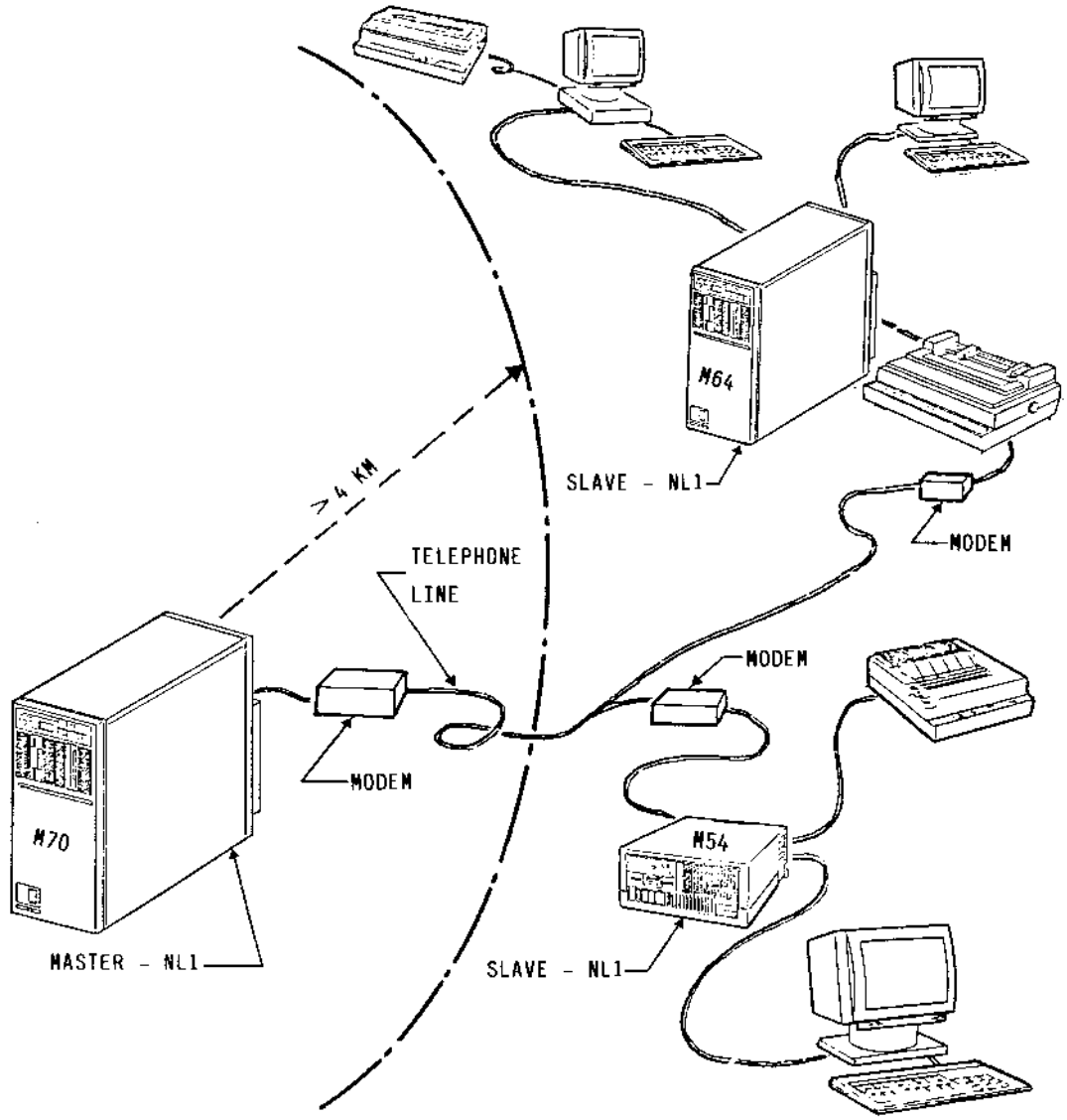


Figure 7-4 - Example of NL1 line connection to external line

7.3 LION INTERIOR LINE

7.3.1 GENERAL

The LION internal line (Local Internal Olivetti Network) is a new form of connection in a cluster configuration and available for the NL1 line products.

It is available in the following versions:

BOARD NAME	FUNCTION	CLASS
GO 333	FAST LION 9.6	
GO 340/A	LION 9.6 + V24	B
GO 340	LION 200 + V24	

7.3.2 INSTALLATION TOPOLOGY

For the LION 9.6, it is necessary to pay attention to the distances between TAP-BOXes, which must not be less than 5 meters when using both branches, or 2.5 meters when using only one branch.

When laying a Fast LION 200 line, a concentration of eight systems per 100 meters of backbone is possible. It is not necessary that they be equally spaced and they can all be concentrated into 15 meters so long as the ninth system is at least 100 meters from the first.

7.3.3 DESCRIPTION OF THE MEANS OF TRANSMISSION

The backbone of the LION internal line must use a cable with very precise characteristics. An appropriate cable is available from stores under the code 5731835 M.

a) DESCRIPTION

This cable consists of a twisted screened pair, Olivetti code 5731835 M.

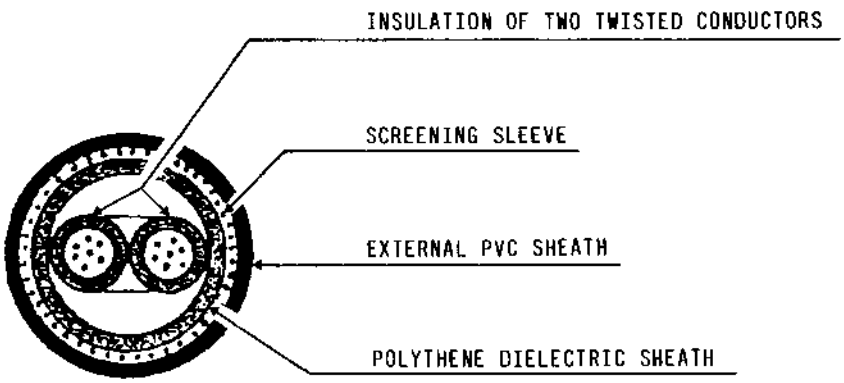


Figure 7-5 - Example of LION cable

b) PHYSICAL CHARACTERISTICS

- Two AWG 20 conductors, each formed of seven AWG 28 wires.
- One conductor is of red copper, the other of tinned copper.
- Each conductor is insulated with PTH polythene having an outside diameter of 2.10 mm.
- The twist interval of the pair of conductors is not more than 62 mm.
- The dielectric is a polythene sheath, of natural colour, with an external diameter of 6.5 mm nominal.
- The screen is formed from a net sleeve of tinned copper using AWG34 wire with a covering factor of not less than 95%.
- The external insulation is a black PVC sheath with a nominal thickness of 0.76 mm and a nominal external diameter of 8.25 mm. It has UL approval.

c) ELECTRICAL CHARACTERISTICS

- Capacity	:	53.2 pF/m max
- Impedance	:	111 ohm ± 5% at 0.5 MHz 105 ohm ± 5% at 2.0 MHz
- Attenuation	:	10 dB/Km at 1.0 MHz
- A.C. electrical resistance	:	36 ohm/Km
- Propagation velocity	:	66% ± 5%
- Maximum operating temperature	:	-40 to +80 ° C
- Maximum operating voltage	:	300 V
- Relative humidity	:	10 to 90%
- STYLE	:	2498.

NOTES:

1. When replacing an old MOIN line with a LION 9.6 type line, the existing backbone can be re-used, but taking account of the following limitations:

   a) The backbone cable must correspond to the characteristics described in the "MOIN" chapter.

   b) The cable must always be a screened type.

   c) The backbone must have a maximum length of 1.2 Km.

2. For all new installations of the LION 9.6 internal line, the AWG20 cable is always used since it provides better guarantees of the signal attenuation over long distances.

3. In cases of installing LION 200 internal lines, the AWG20 cable is always used since, at this data speed, the internal line will not function with a cable of a lesser section.

7.3.4 BRANCHING DESCRIPTION

For the interior LION line (both types) a specific branching box is required, called a TAP-BOX. This can be ordered from DPDP under the name of TAP 1070.

This TAP-BOX allows connection, via appropriate terminals, of the two backbone trunks, the backbone screen and one or two branches for terminals.

TAP-BOX

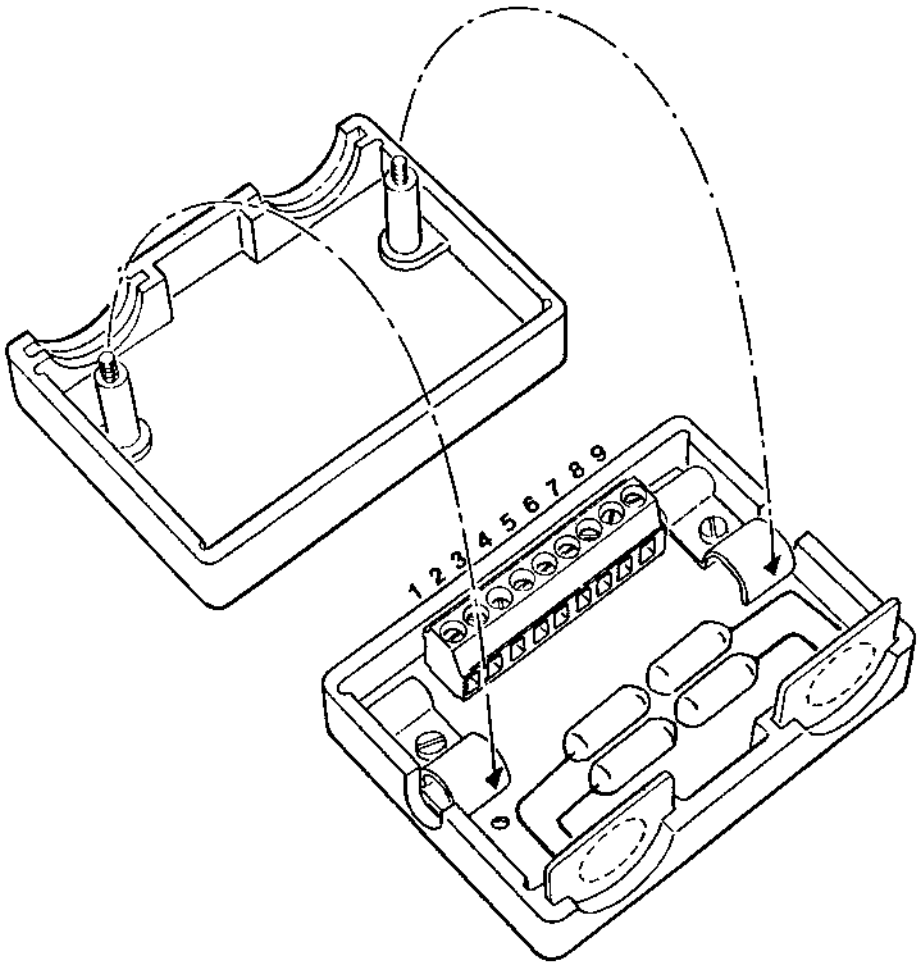


Figure 7-6 - TAP-BOX

NL1 SYSTEMS CONNECTED TO LION 9.6/200 TYPE INTERNAL LINES

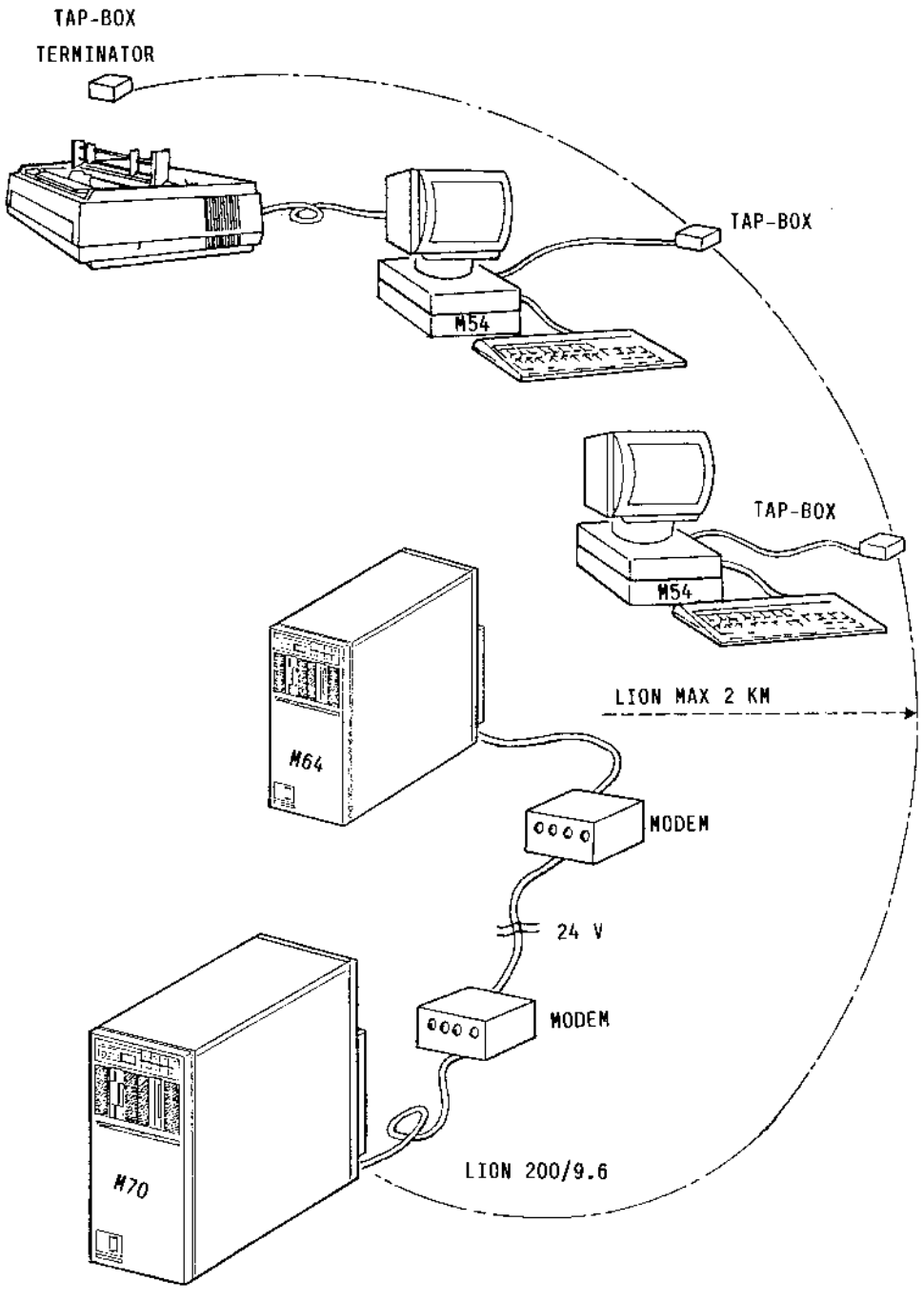


Figure 7-7 - NL1 connection using an internal line

7.4 LOCAL OMNINET NETWORK

7.4.1 GENERAL

The local OMNINET network as applied to NL1 systems is an interior line allowing a high transmission speed of 1 Mb/s. It is made up from:

1. A backbone cable.
2. TAP-BOXES
3. A ground cable
4. Work station connection cables.
5. REPEATERS.
6. A GO 308 board.
7. Dischargers (only for inter-building connections).

The GO 308 board has a class A rating in the ECMA standards, so that backbone sections outside the establishment are not possible.

7.4.2 INSTALLATION TOPOLOGY

The backbone cable is layed using a twisted screened pair. This type of cable, with AWG20 conductors, is available by the meter from DRS under the code 5731835 M.

The OMNINET network must respect the following parameters:

a) Maximum distance between TAP-BOXES or between REPEATERS is 150 m.

b) Minimum distance between TAP-BOXES is 2.5 m.

c) Maximum length of a segment without using a REPEATER is 150 m.

d) The maximum number of REPEATERS is 3.

e) Tha maximum length of the line is 600 m.

f) Each segment of the line, up to 150 m, can have up to 16 TAP-BOXES with one or two connections, but the maximum load permitted in the 150 meters is 16 systems (64 systems on the complete network).

There is an integral TAP-BOX included in the REPEATER where two systems can be connected. These systems are a part of the backbone segment connected to the local section and must be included in the number of systems allocated to this trunk in relation to the maximum number of systems (with a maximum of 16 systems for 150 meters of line).

EXAMPLE OF OMNINET BACKBONE

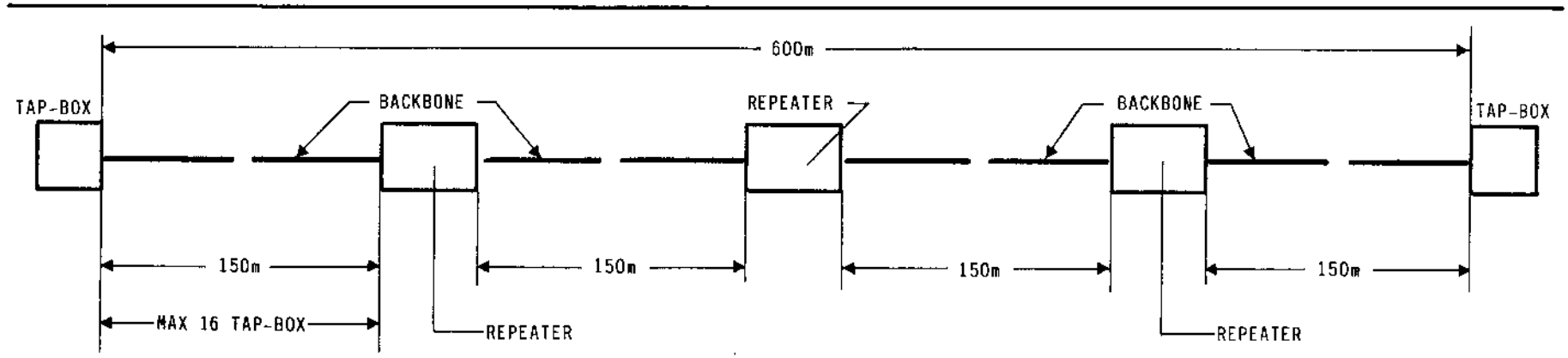


Figure 7-8

7.4.3 PRECAUTIONS FOR NETWORK SAFETY

The entire area served by the OMNINET network must be connected to the same ground to avoid potential differences.

The systems connected, the repeaters and the screening sleeve of the backbone must be connected to the same ground.

It is preferable to use only one power distribution panel. When this is not possible, the panels must have a common ground.

The maximum voltage acceptable on the ground connection of an OMNINET network is 3 V.
A potential difference of 12 V or more is sufficient to damage the drivers for the lines connected.

7.4.4 CABLES FOR THE OMNINET NETWORK (LCU 3345)

The cables to be used for laying the backbone of an OMNINET network are the same as described for the LION 9.6/200.

7.4.5 DROP CABLE

This is the cable for connecting the TAP-BOX to a system and has AWG20 conductors as for the backbone. It has a maximum length of 2.5 meters.

7.4.6 REPEATERS

The repeater is a module, developed in Olivetti, for regenerating the signals, eliminating spurious peaks and phase distortions and to permit galvanic isolation between two sectors of the line.

7.4.7 DISCHARGERS

Dischargers must be installed according to ECMA standards on inter-building sections. They must be installed at each inlet/outlet of the backbone to/from buildings and their connection to ground must be ensured for reasons of security and operation.

For further details of dischargers, refer to the NOP "INSTALLATION STANDARDS FOR LOCAL OMNINET NETWORKS WITH REPEATERS" coded 3874208 Z 19.

7.5 LOCAL ETHERNET NETWORK

The local network with an ETHERNET interface is, at present, the means of communicaton which offers the fastest transmission speed (10 Mb/s) used by the Olivetti NL1 systems.

The notable flexibility in the topology of this network allows installations such as to satisfy the exigencies of the customers while retaining full compliance with the standards adopted (IEEE 802.3).

For further details, refer to the NOP "INSTALLATION STANDARDS FOR LOCAL ETHERNET NETWORKS" code 3874208 Z 18.

The items required to build up an ETHERNET are as follows:

- GO 212A board (placed in the NL1 cassette rack).
- Transceivers.
- Repeaters.
- Terminations.
- Link cables.
- Trunk cable
- Drop cables.

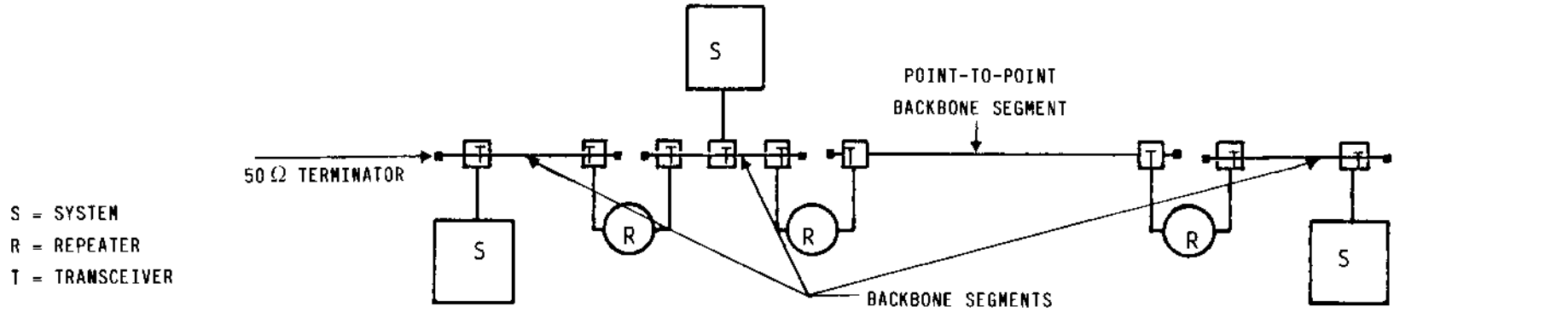
7.5.1 NETWORK CONFIGURATION

Attention must be paid to the limitations imposed by the IEEE standard 802.3:

- Maximum length of a backbone segment is 500 meters.
- There is a maximum of five segments between two systems, with up to four repeaters and a maximum total length of 2600 meters, with the condition that at least two of the segments are the point-to point type, i.e. without any transceiver inserted.
- Each segment can support a maximum of 100 transceivers.
- The entire network can support a maximum of 1024 transceivers.
- The TRUNK CABLE (backbone) must be installed with the appropriate terminations (R = 50 ohm).
- The DROP CABLE is the means of transmission for connecting the transceiver to a system at a maximum distance of 50 meters.
- The TRANSCEIVER is the device connected to the trunk cable to provide the connection point for the system which has to be attached to the network.
- The REPEATER is the device to regenerate the signals and to allow further segments to be connected. Repeaters are inserted in routes of more than 500 meters.

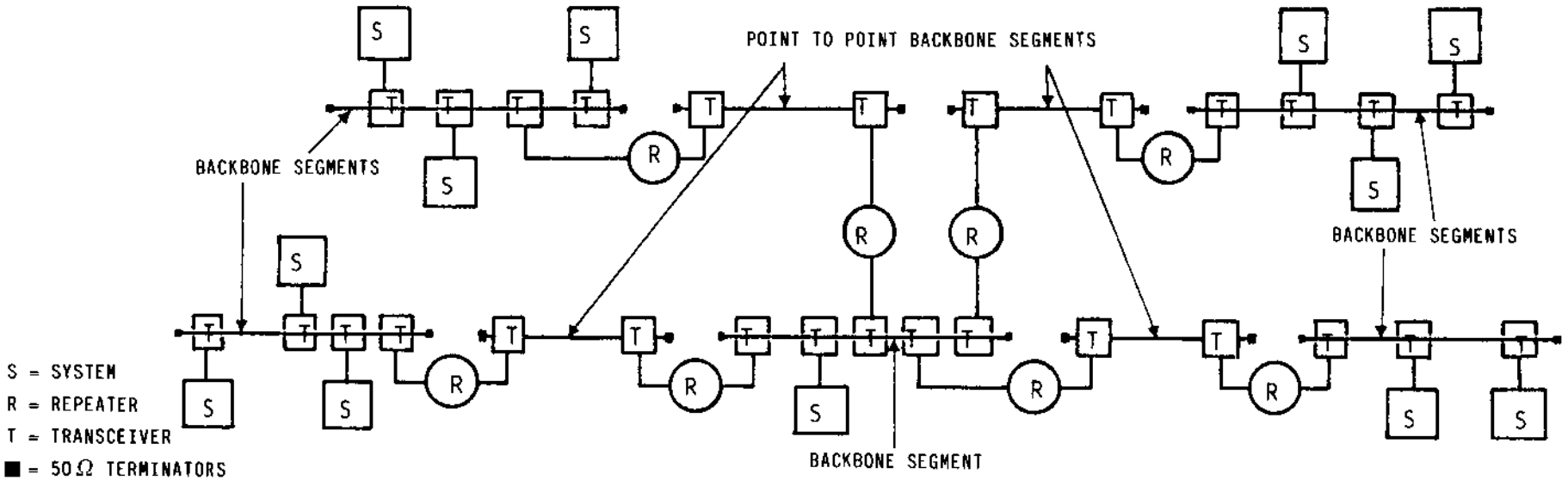
EXAMPLE OF ETHERNET NETWORK

The schematic shows a type of network using 3 Repeaters connecting 3 segments and one point-to-point segment.



OVERALL NETWORK TOPOLOGY

3 backbone segments can be seen, separated by 2 point-to-point segments.



7.5.2 CABLES FOR ETHERNET (LCU 3323)

a) The backbone cable to use for ETHERNET type networks must have precise characteristics. It differs from the cables used for traditional types of line in that a coaxial cable is used to carry the high speed data transmitted (10 Mb/s).

b) DESCRIPTION

The cable is shown in Figure 7-9.

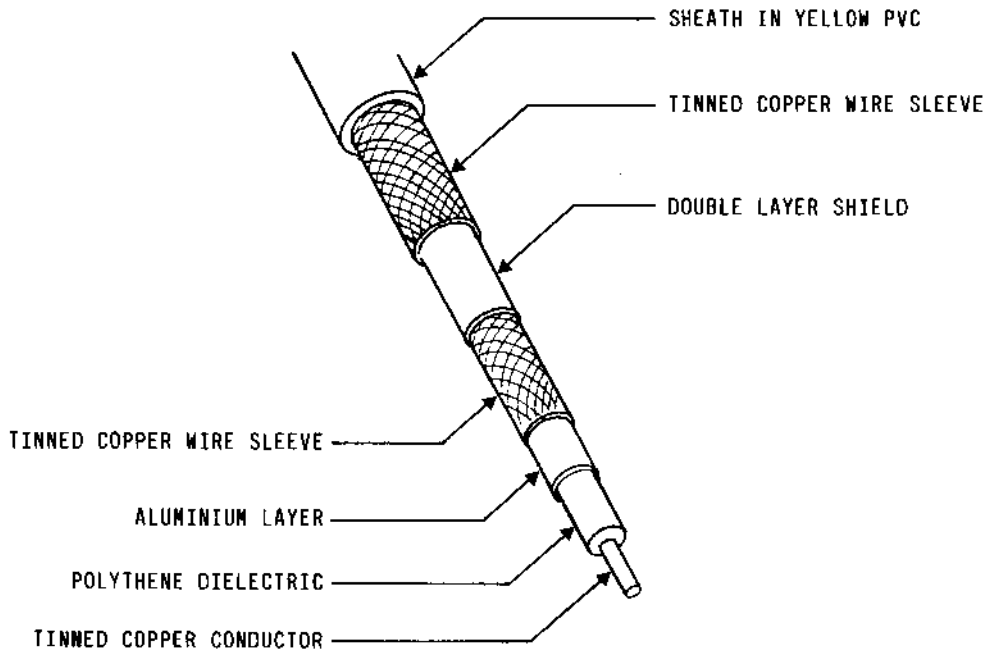


Figure 7-9 - Backbone cable

c) COAXIAL CABLE CHARACTERISTICS

- ETHERNET type
- Characteristic impedance : 50 ± 2 ohm
- Attenuation at 10 MHz : 1.7 dB/100 m
- Attenuation at 5 MHz : 1.2 dB/100 m
- Capacity : 85 pF/m
- Dielectric : Expanded polythene
- Single central conductor : Red copper 2.16 ± 0.013 mm diameter
- External diameter : 10.3 mm
- Screen : Double in red copper.

d) DROP CABLE (CBL 3391/2/3/4)

This type of cable is used to connect the backbone cable to the NL1 units (TRANSCEIVER ---> NL1)

DESCRIPTION

This is a screened multiple twisted pair cable with an aluminium shield. The external screen must be insulated from the screens of the internal pairs. All the pairs are covered with polythene.

- Three pairs are in AWG 22 : blue/green
  yellow/orange
  black/white.
- One pair is in AWG 20 : violet/grey.
- Continuity wire : AWG20 triple tinned copper.
- Overall screening : about 90% coverage
- External sleeve : Olivetti grey, 10 mm max diameter.
- Characteristic impedance : 78 ohm.
- Propagation factor : 66%.

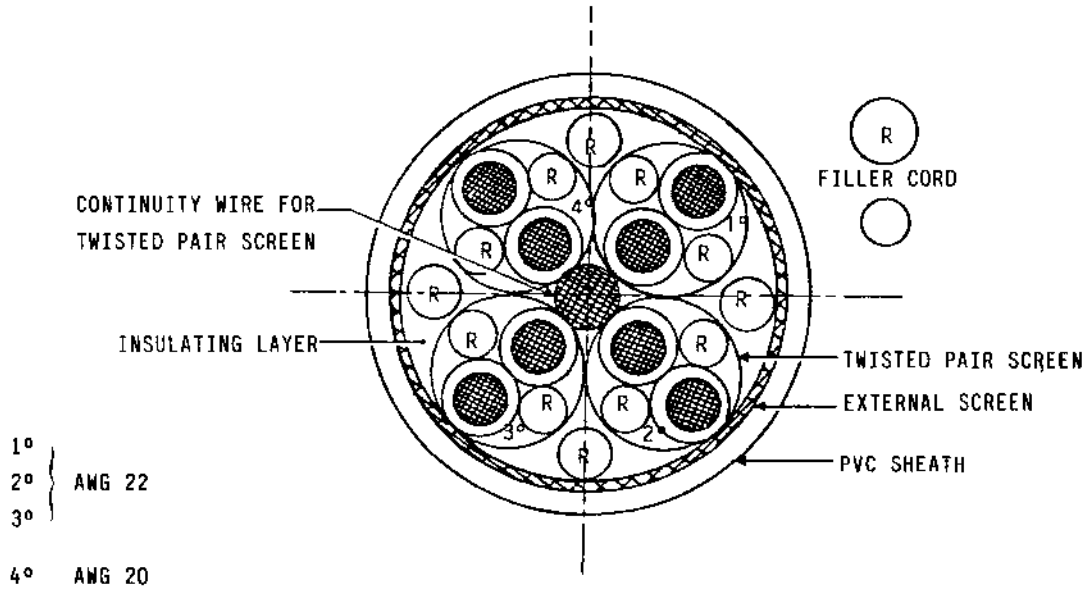


Figure 7-10 - DROP CABLE

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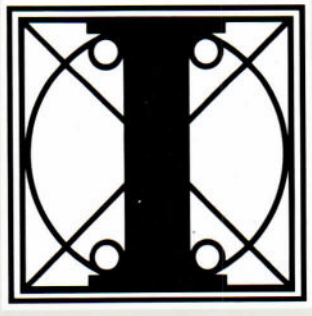

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