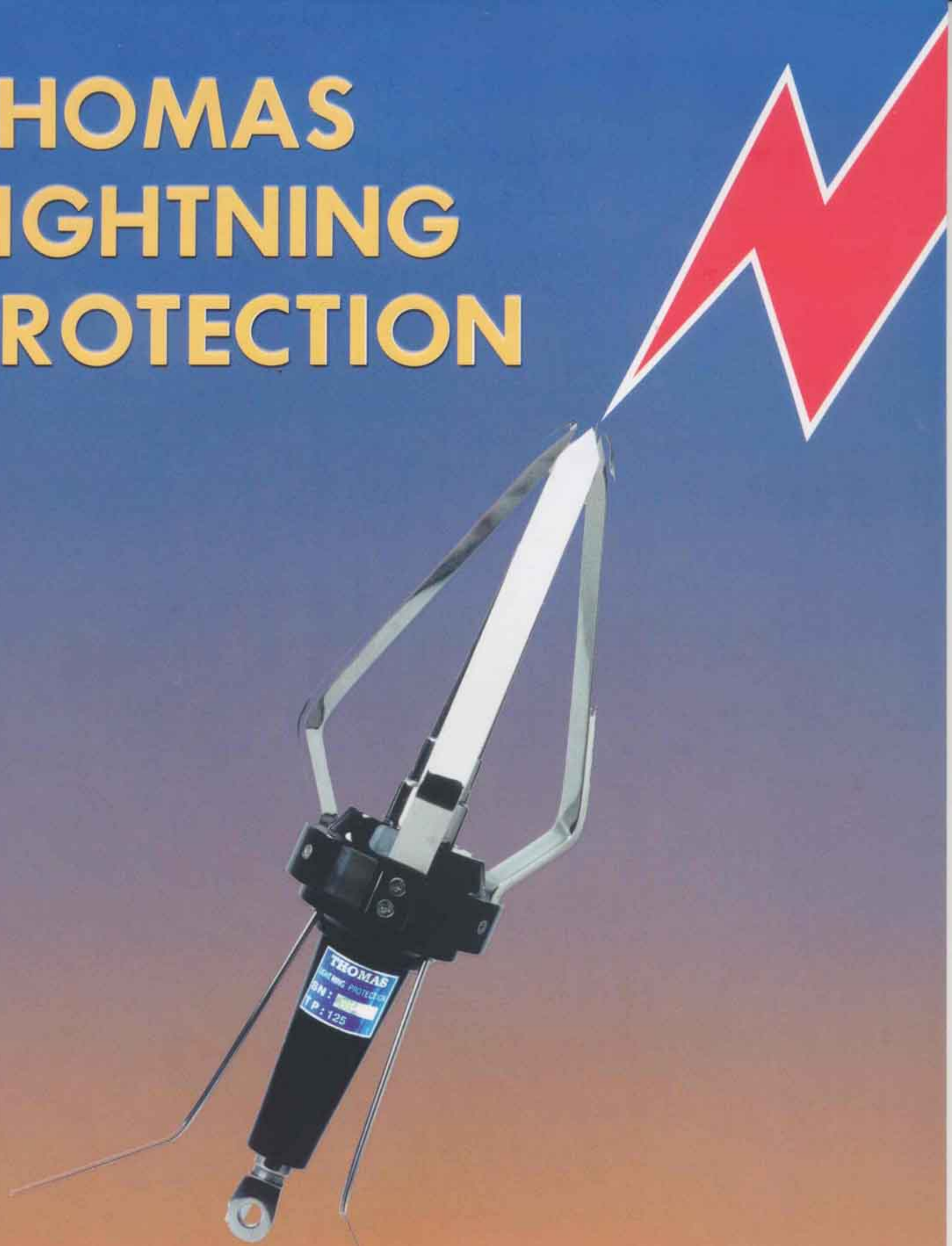
THOMAS LIGHTNING PROTECTION



Electrostatic and membrane System

"THOMAS"

NEW EMSY

LIGHTNING PROTECTION

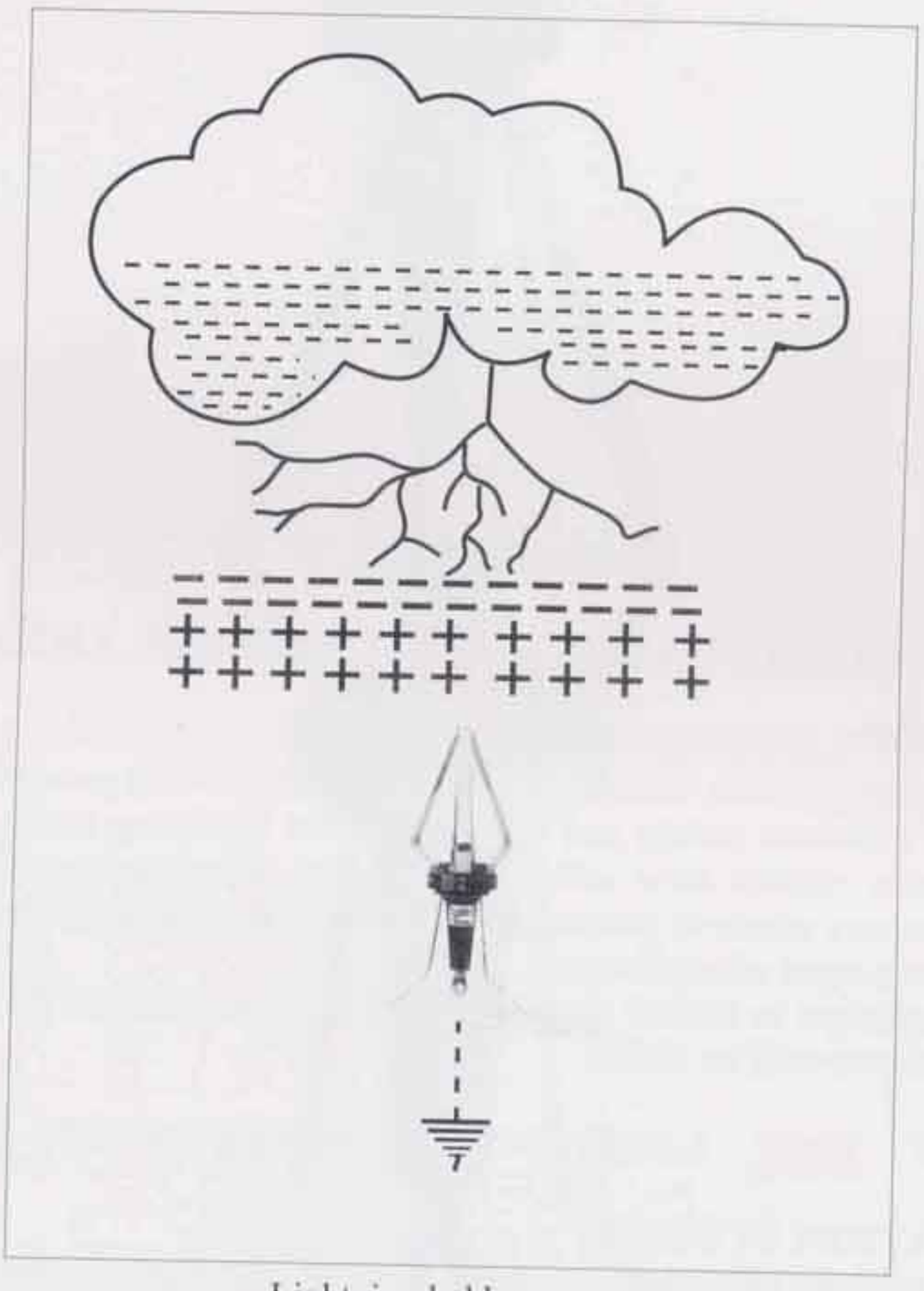
Electrostatic and Membrane System

THOMAS *NEW* EMSY LIGHTNING PROTECTION IS BASE ON ELECTROSTATIC and MEMBRANE SYSTEM THAT GENERATED STREAMER WHEN A STORM IS THREATENING. THE MOST EFFICIENT LIGHTNING CONDUCTOR SYSTEM KNOWN AS.

THE LIGHTNING PROCESS

Rain consists of drops of water that fall from clouds. These clouds are formed as result of the rissing of moist air in the atmosphere that condensate to become grains of water that float in the air, and are seen from below as clouds. The next process, these grains of water that float in the air, and are seen from below as clouds. The next process, these grains of water develope the weight and size until reaching the diameter of 0.5 - 5 mm and fall down as drops of rain.

When there is an accumulation of charges activity in the cloud, it generates a charge of oppasite polarity that creates a large electric field between clouds and earth. The electric field will influence objects higher than the earth surface that discharge the positive ion and form channel like a ribbon of air moving towards ribbon of negative ion originated from cloud. If these two ribbons meet of one point in the air, then a flow of lightning current will discharge trough the channel forms by those two ribbons to earth. A large critical potential difference of elektrical voltage gradient (V/d) will exceed + 10 kV/cm$_2$ as result, electrons will leave the base of clouds that seems like luminescent traject called "Lightning Ladder".



Lightning ladder process

The lightning ladder progresses rapidly toward the earth trough branching track. When one of the lightning ends is near by to the earth, then a positive charge wikll discharge from earth that causing short circuit between earth and clouds that produce a large electric current. At the seem moment, the powerfull explosion is called thunder will be heard.

Usually, the laightning will choose targets at places that contain enough electric charge and closer enough to the reach. Therefore in orger to protect buildings electronic equipment or else, from the lightning strike, the lightning protection should be installed.

THOMAS *NEW* EMSY LIGHTNING PROTECTION ELECTROSTATIC and MEMBRANE SYSTEM is an external lightning protection that is very reliable to protect building strike. **THOMAS *NEW* EMSY** lightning protection electrostatic and membrane system operates based on the ionic from plasma that produces streamer to drive away the lightning strikes.

THOMAS *NEW* EMSY

THE PRINCIPLE OF THOMAS *NEW* EMSY EXTERNAL LIGHTNING PROTECTION

THOMAS *NEW* EMSY LIGHTNING PROTECTION is a lightning protection electrostatic and membrane system that operates based on ions from plasma that produces by one electrode, and a potential difference between clouds and drive away the lightning strike.
Down claw end, under electric field influence between clouds and earth, an electric discharge can be generated that creates positive potential. Between electrodes distance, an electric voltage will occur that might discharges electric spark.
A generated plasma helps to enrich electrons and accelerate snow balling process, therefore the streamer forming proces will be faster.

THOMAS *NEW* EMSY LIGHTNING PROTECTION SYSTEM consists of:

1. **AIR TERMINATION SYSTEM**.
   Performs as an arrestor of lightning strike point to the earth in order to protect the protective zone from lightning strike hazards.

2. **DOWN CONDUCTOR**
   Only one down cable performs to conduct lightning current captured by air terminator to the earth.

3. **EARTH TERMINATION SYSTEM.**
   Performs to spread the electric current as a result of lightning to the ground, where the grounding electrodes are in connection with conductor.

DIFFERENT TYPE
OF **THOMAS *NEW*** EMSY LIGHTNING PROTECTION

Type 125

Type 60

Type 25

ADVANTAGES OF **THOMAS *NEW*** EMSY LIGHTNING PROTECTION

DOWN LEAD CONDUCTOR

Capacitor componen C, is parallel to resistor R which is series to Inductance L.

$$L = \frac{o.x}{2.x} \quad \frac{(4.D.x)}{4.d}$$

where x = conductor length
D = conductor distance
o = air permeability
d = grounding conductor diameter

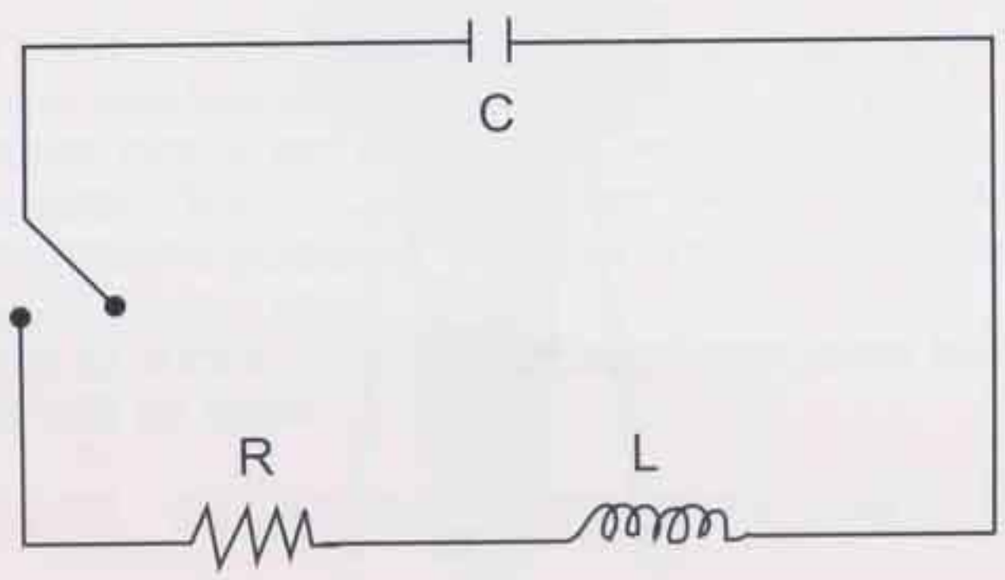
C = grounding conductor capacitance as follows :

C = 1/3C' . x Farad
C' = 1/1' . v_2 Farad/m
L' = velocity of light 3 . 10_8 m/det

B.C. grounding has small capacitance. The voltage drop at earth survace :

$$V = R.I + L \quad \frac{di}{dt} + \frac{1}{C} \quad l\,dt. \quad \text{Volt.}$$

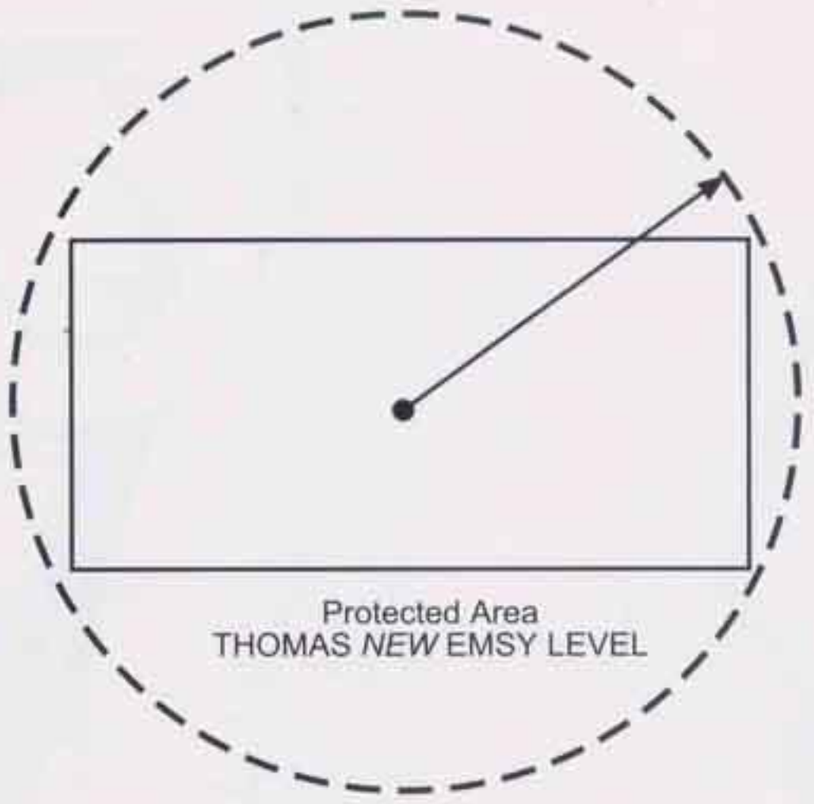
where V = voltage drop
R = grounding conductor resistance (Ohm)
I = lightning current peak value (Ampere)
L = grounding conductor inductance (Henry)
di/dt = lightning current gradient (Amp./det.)

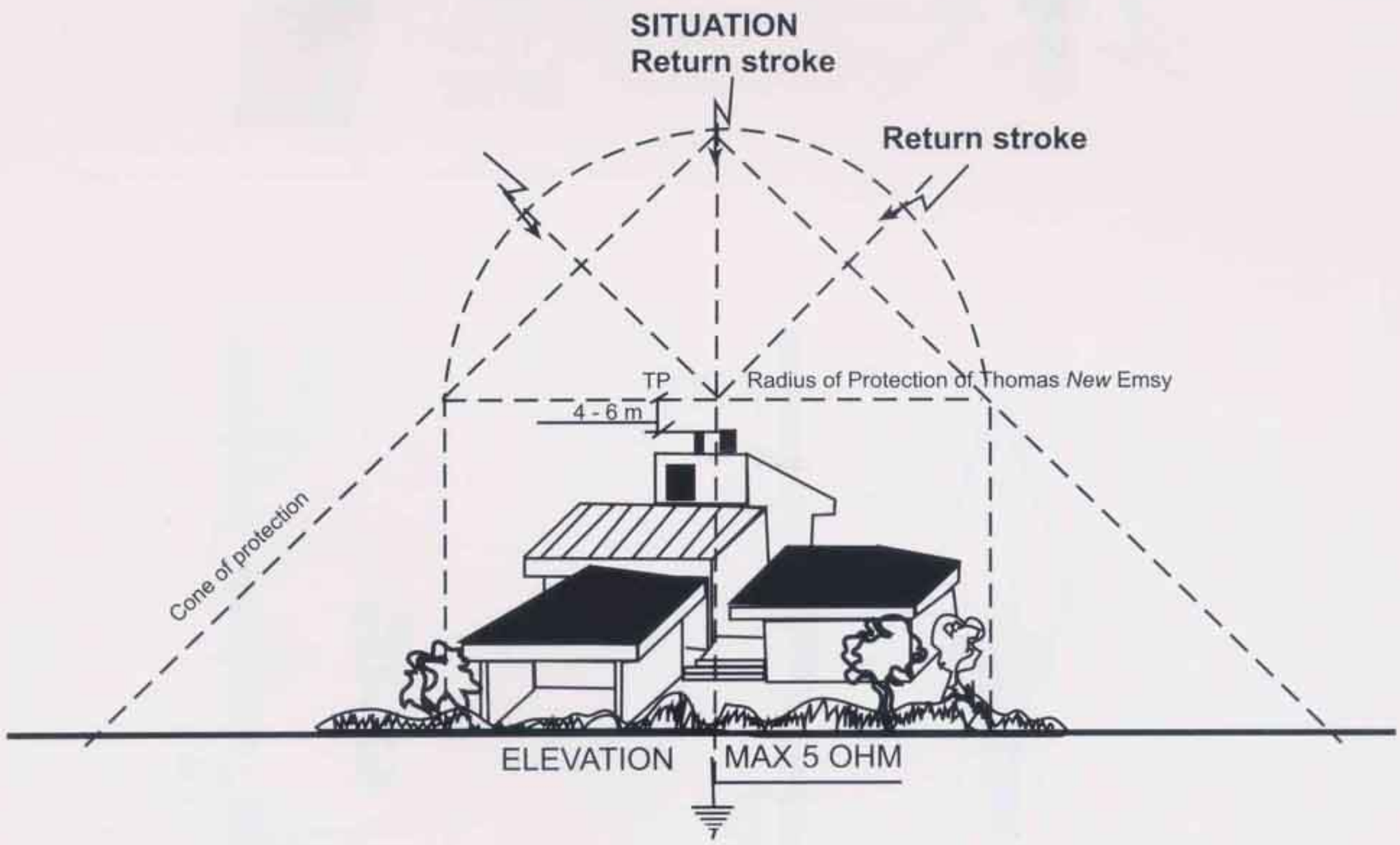


Electrical system analogy

The electrical field intencity is equal to the maximum value of the voltage gradient to the distance.

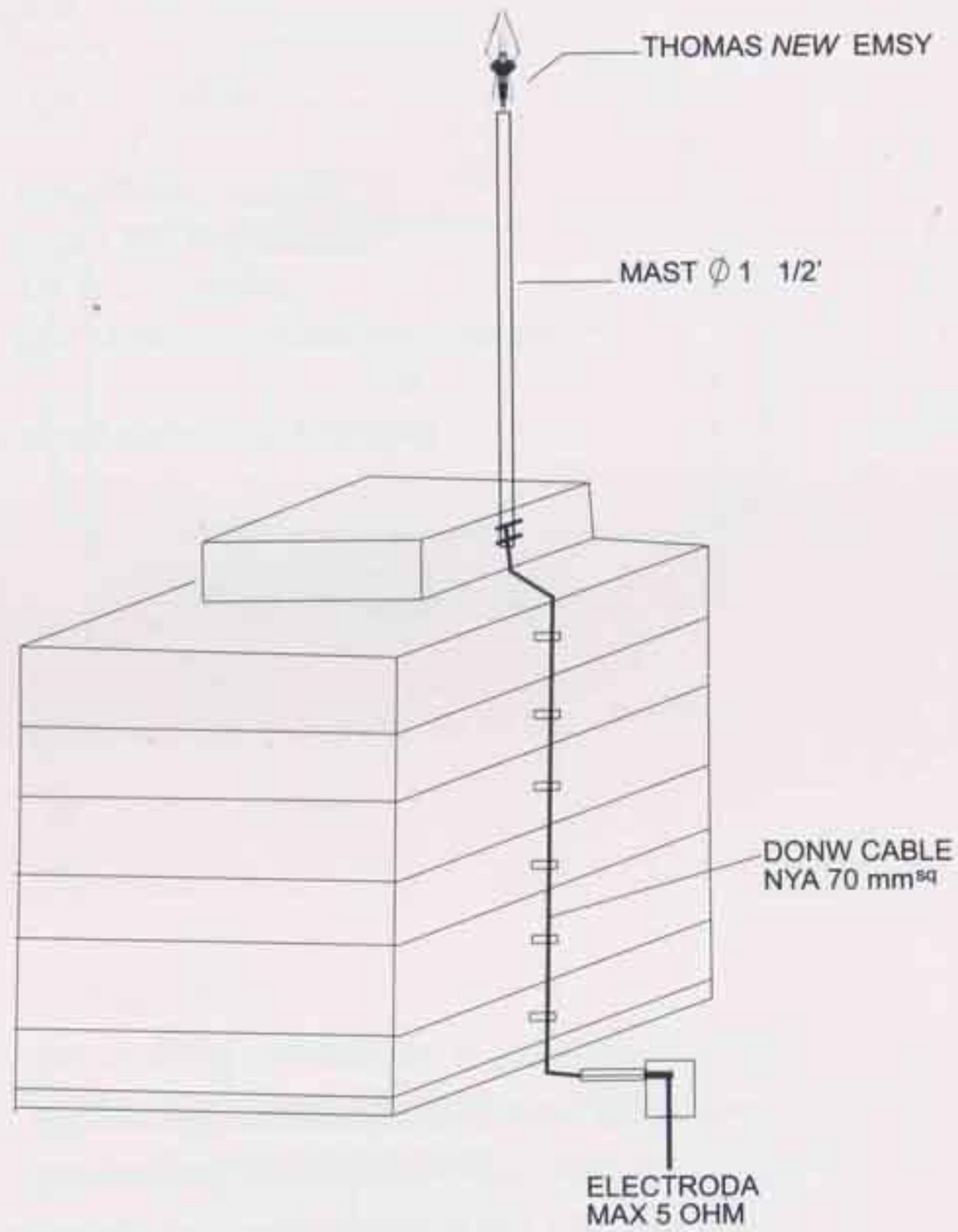
$$E = V / x$$

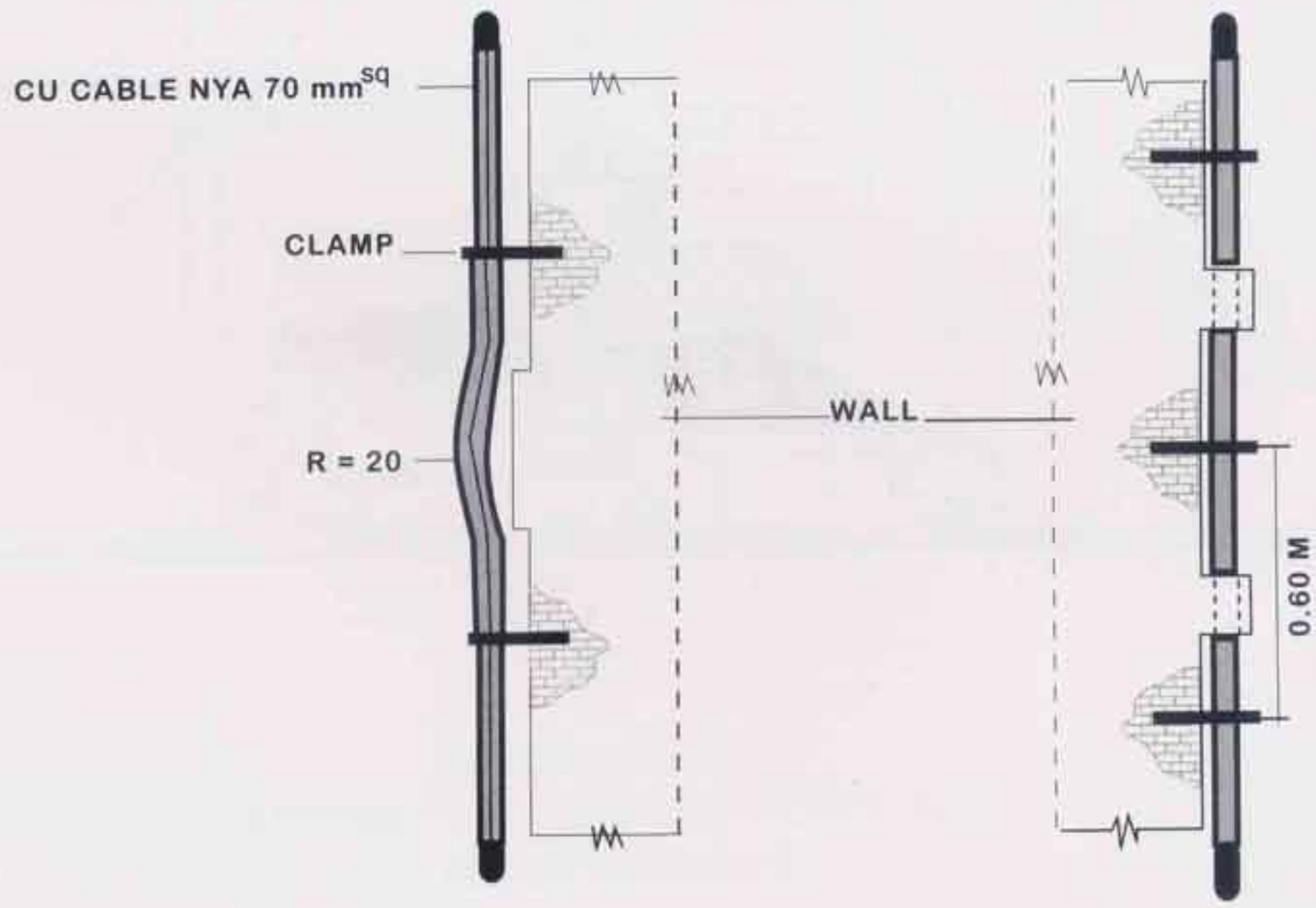




Protection of house
with **THOMAS *NEW*** EMSY Lightning
Protection System

INSTALLATION OF THE
THOMAS *NEW* EMSY LIGHTNING PROTECTION SYSTEM

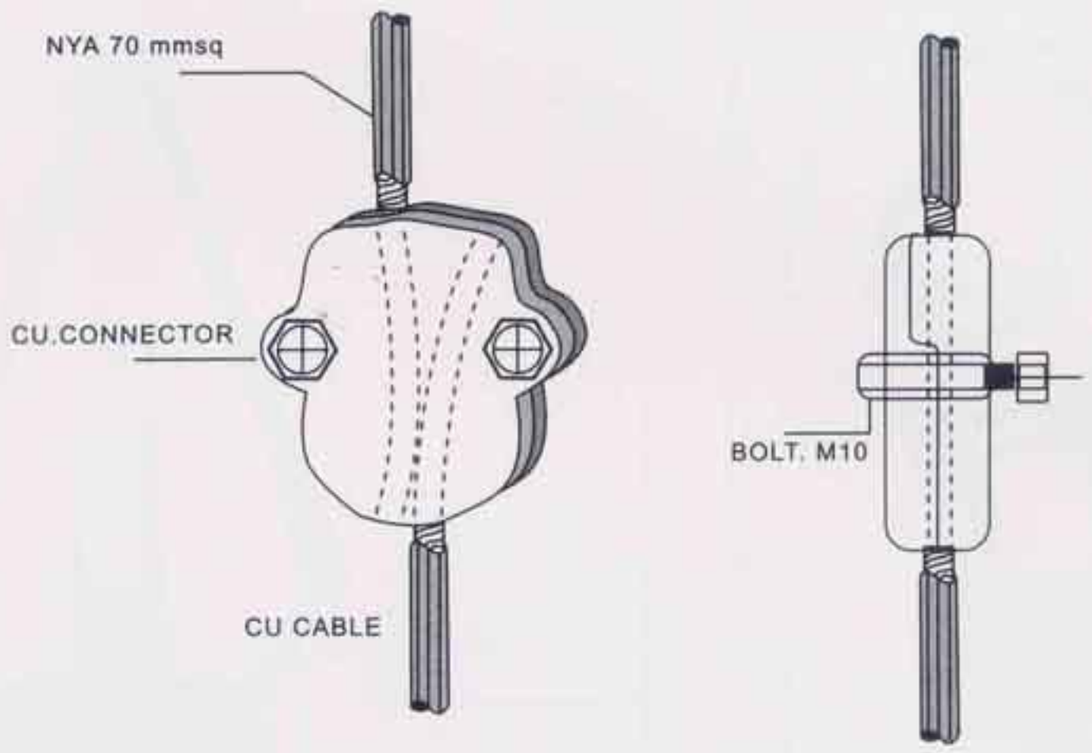




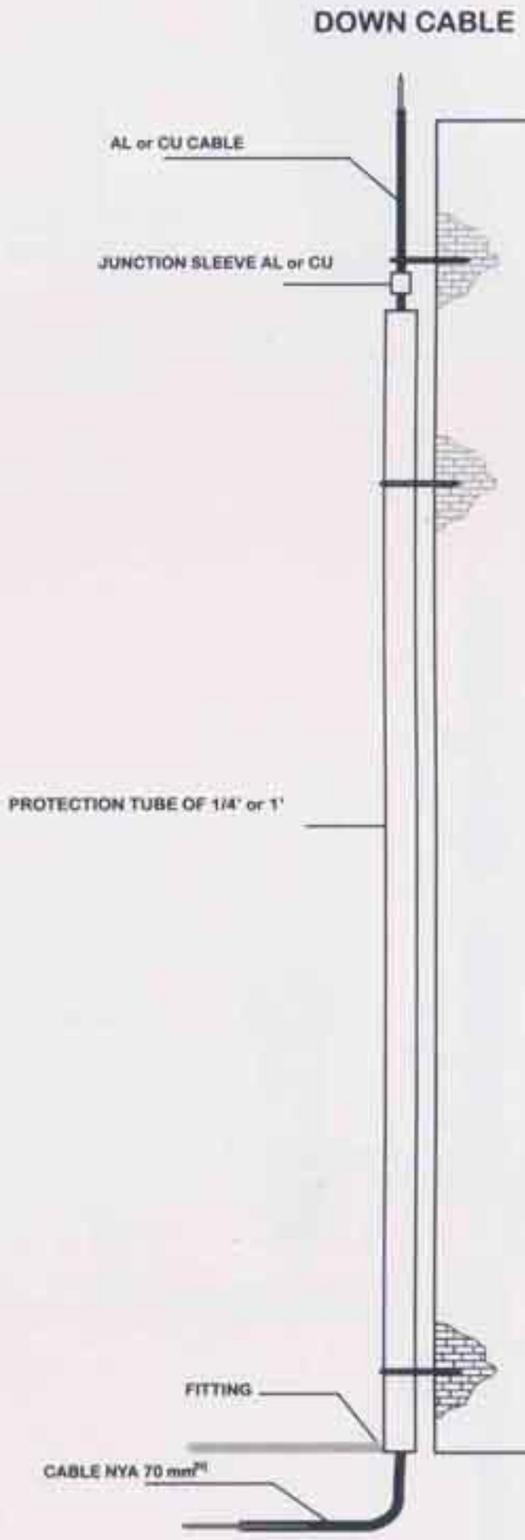
INSTRUCTION FOR THE INSTALLATION OF
THE **THOMAS** *NEW* EMSY LIGHTNING PROTECTION SYSTEM

CONNECTOR Kit T.P

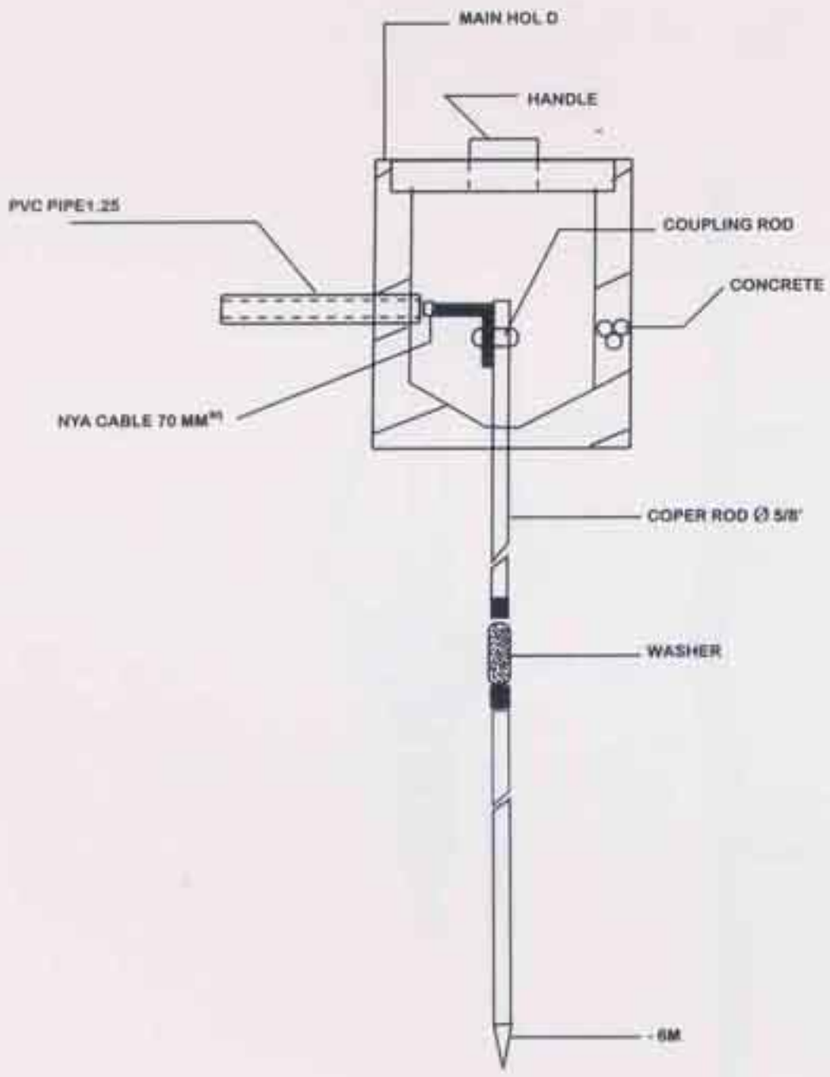
CONNECTOR



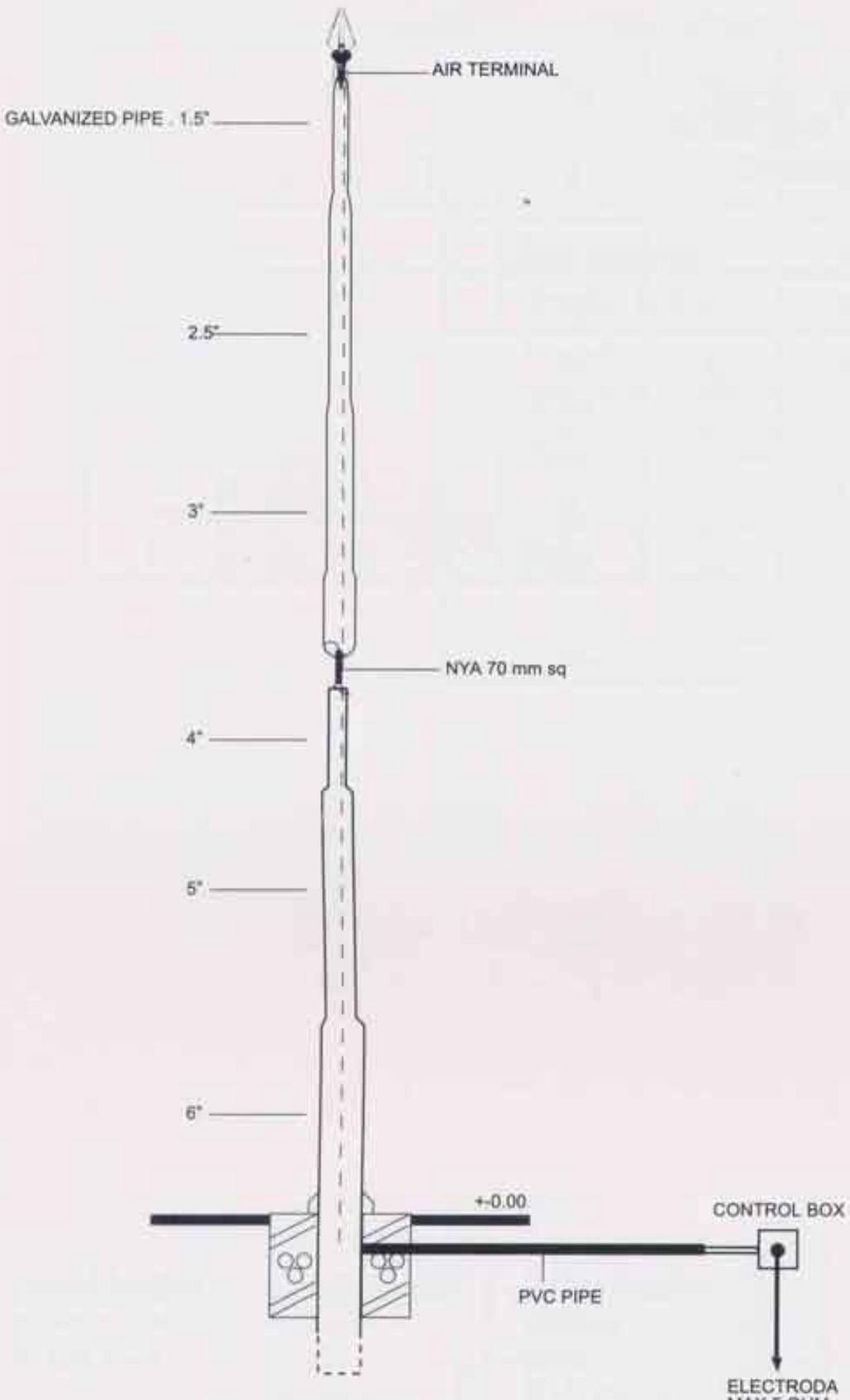
JUNCTION SLEEVE

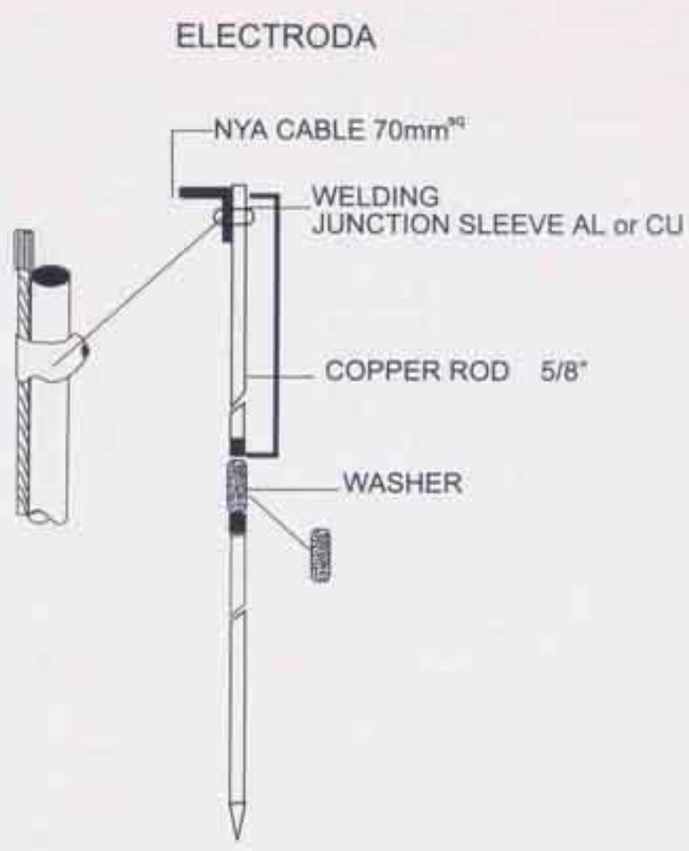


CONTROL BOX



MAST OF LIGHTNING PROTECTION

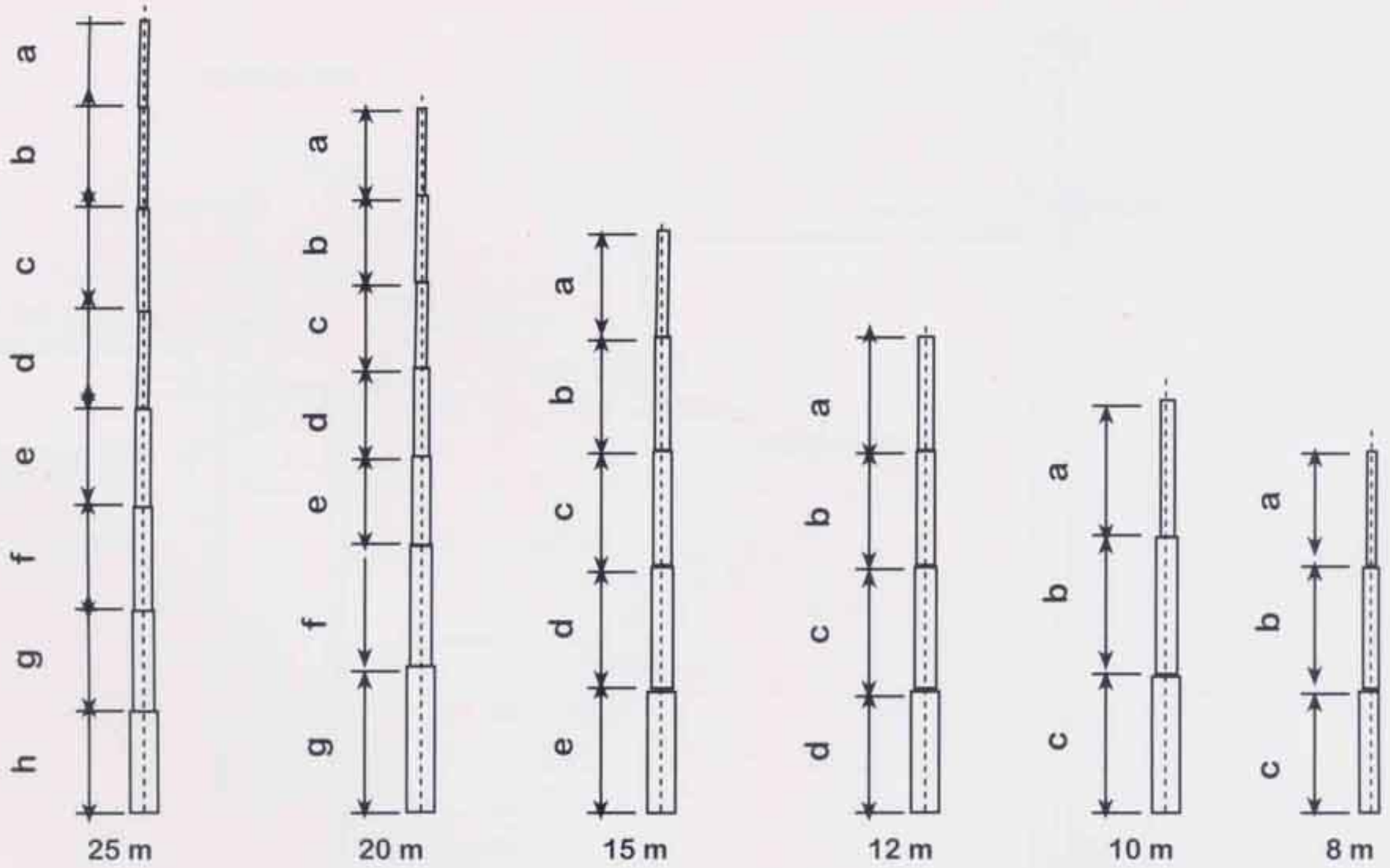




TYPE OF MASTS

for Winds no faster
that 125 Km/h

Ø mast	1½" a	2" b	2½" c	3" d	4" e	5" f	6" g	7" h
8 m	3	3	3					
10 m	4	3	4					
12 m	4	3	3	4				
15 m	3	3	3	4	4			
20 m	3	2'5	3	3	3	4	4	
25 m	3	3	3	3	4	4	4	4



SPECIFICATION OF THOMAS *NEW* EMSY
LIGHTNING PROTECTION AND MEMBRANE SYSTEM

SPECIFICATIONS Dimensions	
Size (approx)	38.5 cm (15.4")
Weight in Kg	3850 gr's (8.5 lb's)
Length	38.5 cm (15.4")
Wide	10.16 cm (4")
Plate	3 x 2 cm (0.8") x 0.5 cm (0.2")
Cage	3 x d 4 mm² (d 0.16")
Colour	Black & Chromed

Point protecting a building		
Actual height of the point on the roof	Action radius at roof level standard point	Actual radius at roof level THOMAS point
2	3.4	12.1 to 13.8
4	6.9	24.2 to 27.8
6	10.3	38.1 to 41.5
8	13.8	48.4 to 55.4
10	17.3	60.5 to 69.2
12	20.7	72.7 to 83.1
15	26	91 to 104

Point protecting a ground surface		
Height of the point with regard to the ground	Action radius at ground Standard point	Action radius at ground THOMAS - point
6	6	21 to 24
8	8	28 to 32
10	10	35 to 40
12	12	42 to 48
15	15	52 to 60

Figure 1 :UNIDIRECTIONAL
WAVESHAPES (A) OPEN-CIRCUIT VOLTAGE WAVEFORM (B)
DISCHARGE CURRENT WAVEGORM

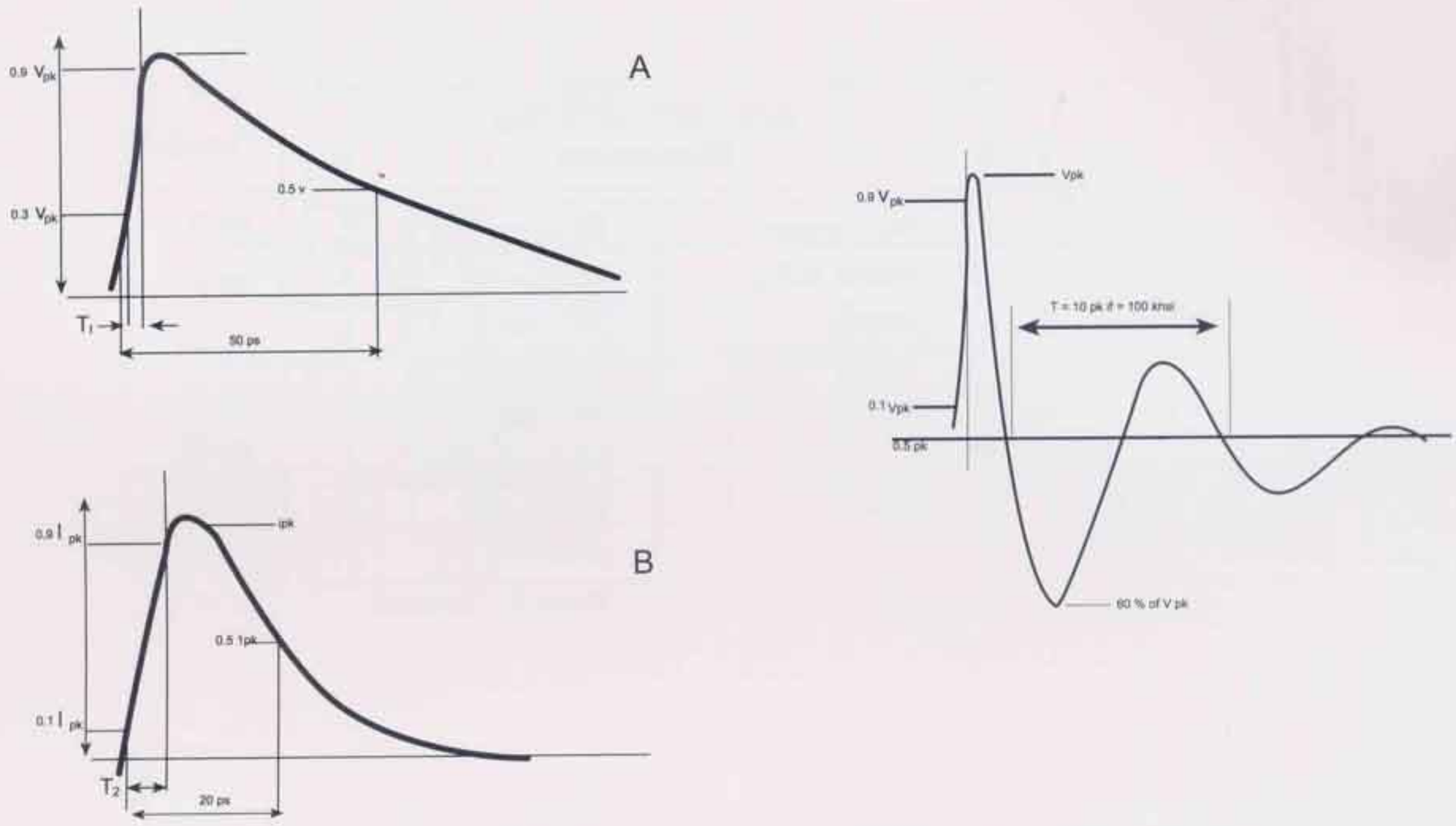
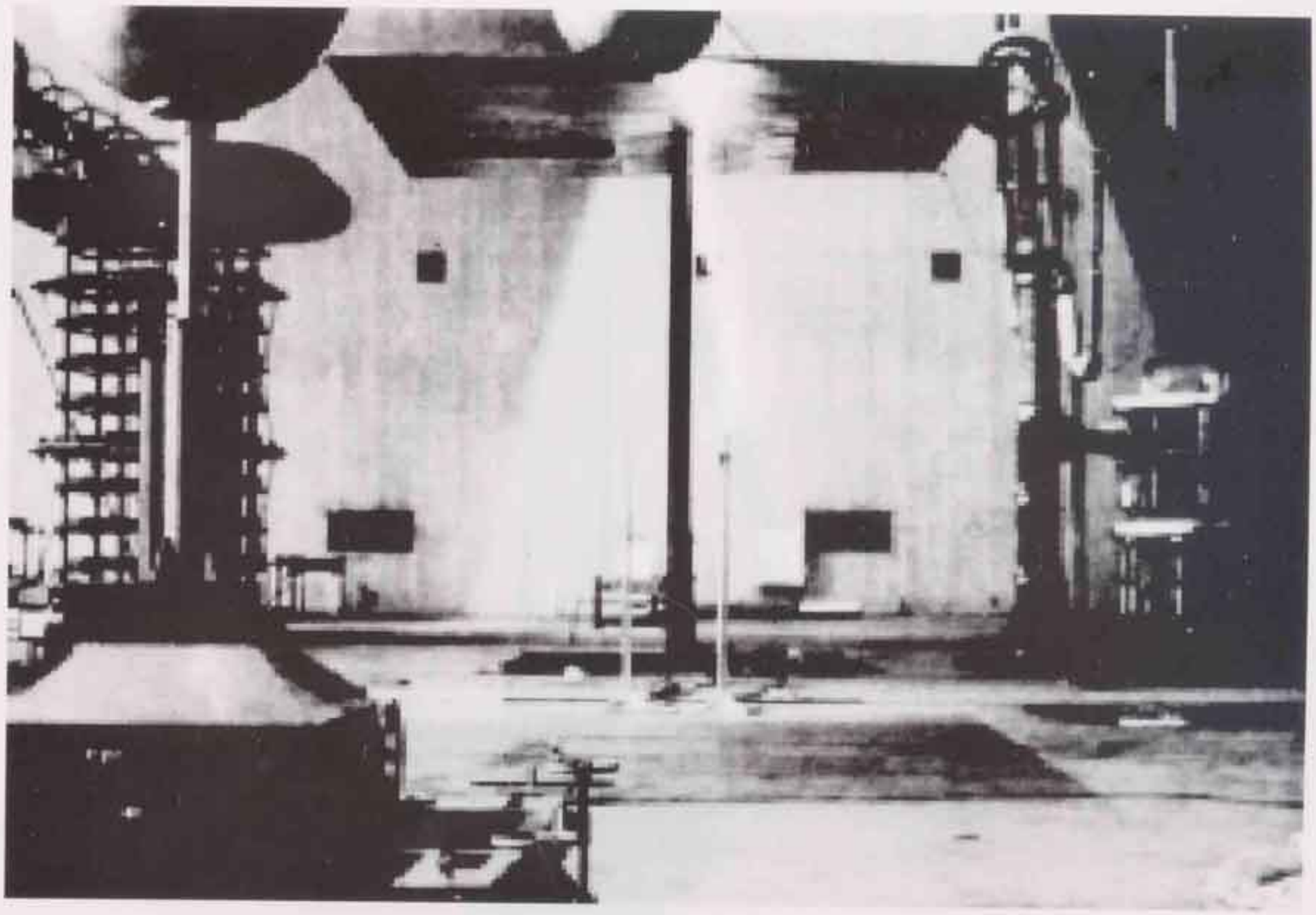


Figure 2 :THE PROPSED 0.5 μS - 100 kHz RING WAVE (OPEN CIRCUIT VOLTAGE)

LOCATION CATEGORY	WAVEFORM	MEDIUM EXPOSUME PEAK AMPLITUD	TYPE OF LOAD
A. Long Branch circuits and power outlets	0.5μS - 100 kHz	6 KV 200 A	high impedance low impedance
B. Major feeders short branch circuits, and load centre	1.2/50μS 8/20μS 0.5μS - 100 kHz	6 KV 3000 A 6 KV 500 A	high impedance low impedance high impedance low impedance

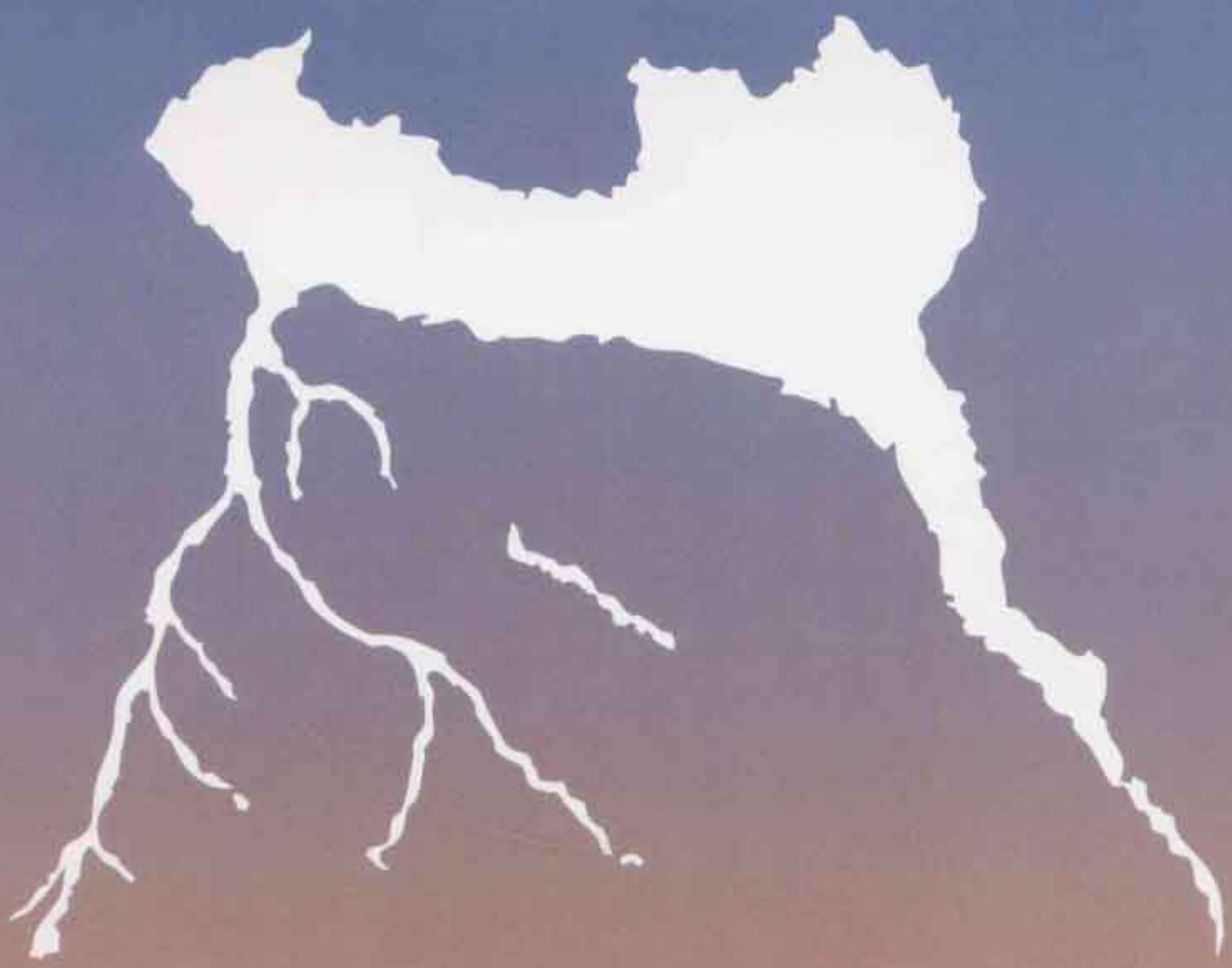
LABORATORIUM TEST



THOMAS NEW EMSY

THOMAS
LIGHTNING
PROTECTION

THOMAS



THOMAS SYSTEM