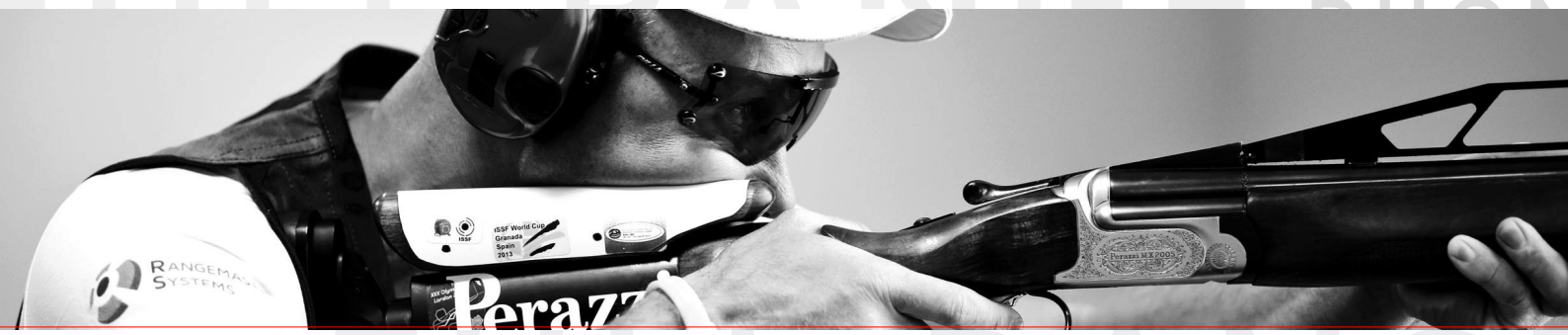
RANGEMASTER SYSTEMS

X3 PRO/.NET PRE-INSTALLATION MANUAL

Revision Date:27.11.2020



PROFESSIONAL SHOOTING GROUND AUTOMATION

INTRODUCTION

In this manual we would like to show and explain what should be done and what should be prepared by a customer for X3 Pro.Net system installation.

It means installation is divided into two parts:

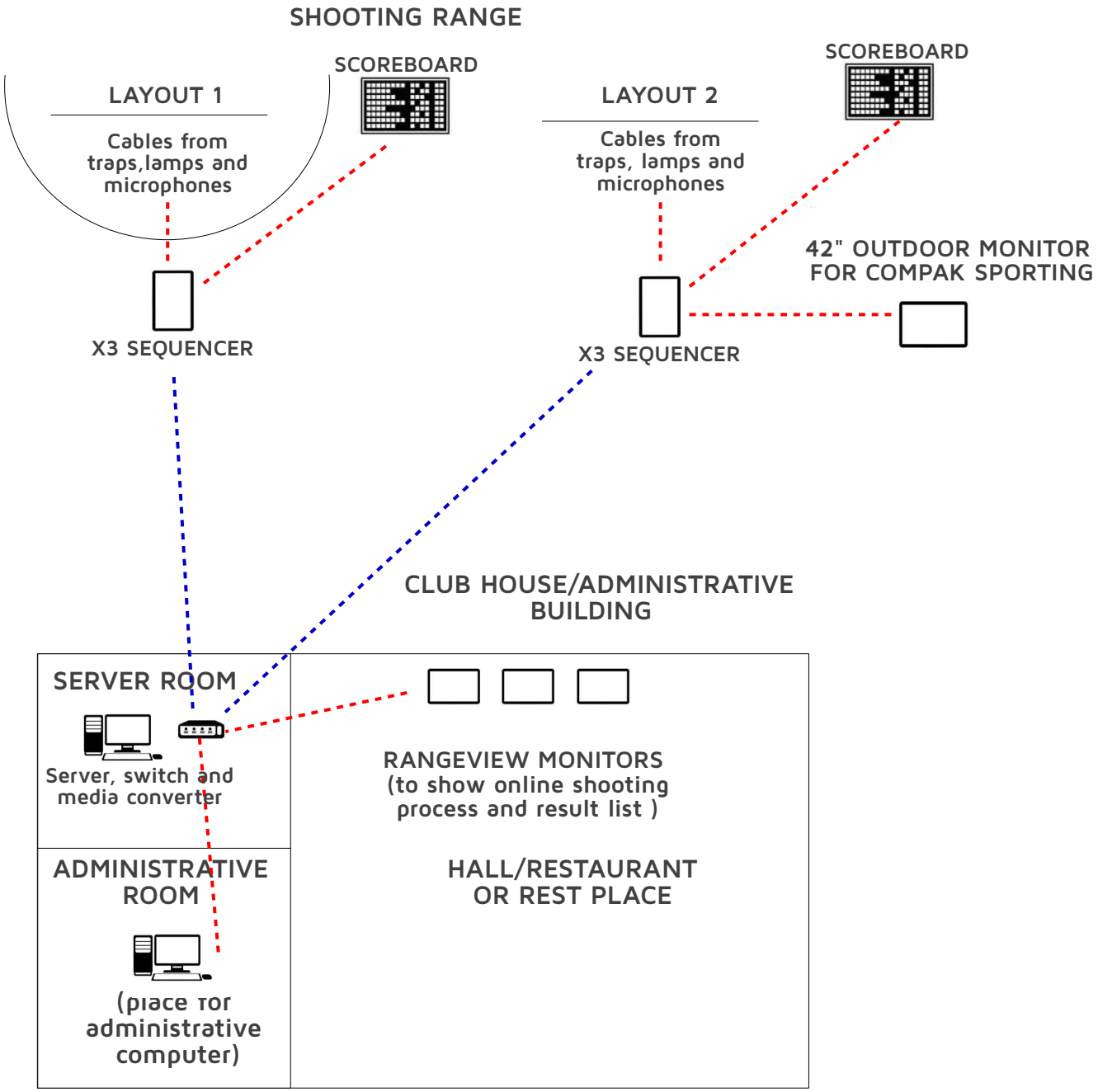
- pre-installation by a customer
- final installation supervision by Rangemaster Systems staff and training how to use the system.

Pre-installation includes:

1. Piping and cabling (laying of pipes for optical, network and power cables for microphones, traps, skeet light, etc.)
2. Preparing place to mount X3 sequencer
3. Prepare place for server
4. Prepare places for microphone connectors
5. Prepare place for administrative computer
6. Prepare place for Rangeview monitors
7. Prepare place for scoreboards and etc.

INSTALLATION SCHEME

Each part will be described more detailed further.



LEGEND

- OPTICAL CABLES
- CAT 6/CAT7 S/FTP NETWORK CABLE

CABLING & PIPING

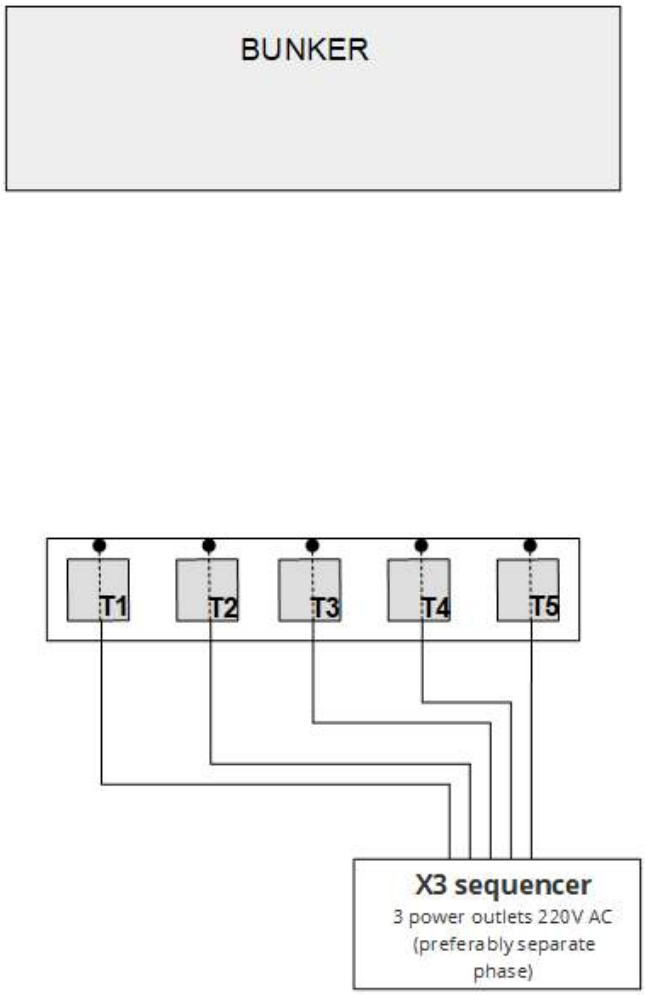
Laying pipes for cables is a very crucial part of installation, because it needs accuracy to avoid additional work and expense.

Further you will find cabling schemes (for microphones and traps) for different layouts according to disciplines. Usually it doesn't matter how pipes/cables are placed, but they should go directly to X3 sequencer from:

- each microphone on the layout
- from trap junction box
- skeet lamp (if it is a skeet or combined layout)
- scoreboard (if there is a scoreboard on the layout)

For some disciplines it is possible to use wireless release.

MICROPHONE CABLING SCHEME FOR TRAP LAYOUT



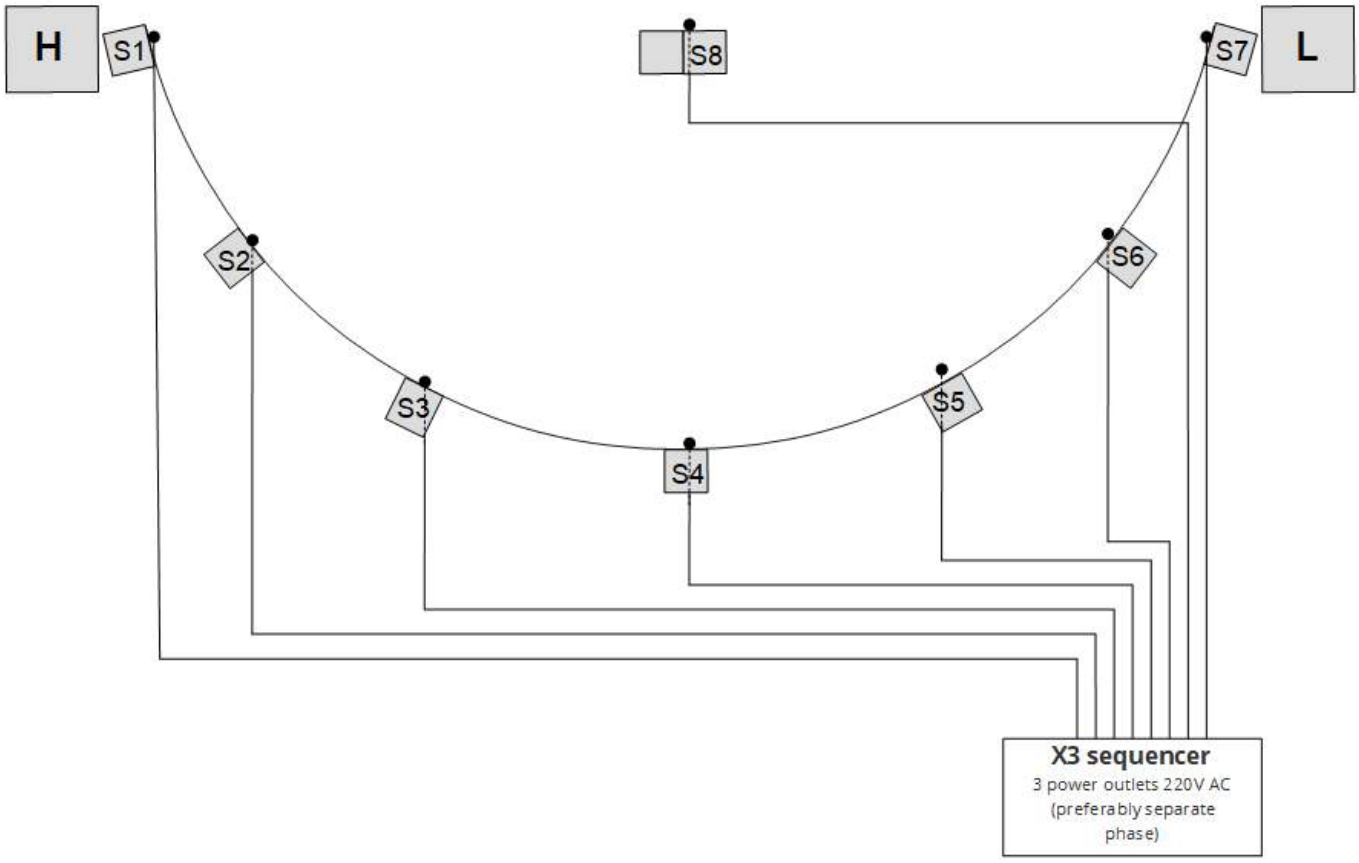
LEGEND

CAT7 S/FTP microphone cable (with 4 pairs of wires: green/white, blue/white, brown/white, orange/white)
x 5 pieces from sequencer to each microphone socket of any station

MICROPHONE CABLES MUST NOT EXCEED 50M IN LENGTH EACH !
MICROPHONE CABLES MUST NOT BE PLACED CLOSE TO POWER LINES !

T1 Connector to microphone on station 1 Trap

MICROPHONE CABLING SCHEME FOR SKEET LAYOUT



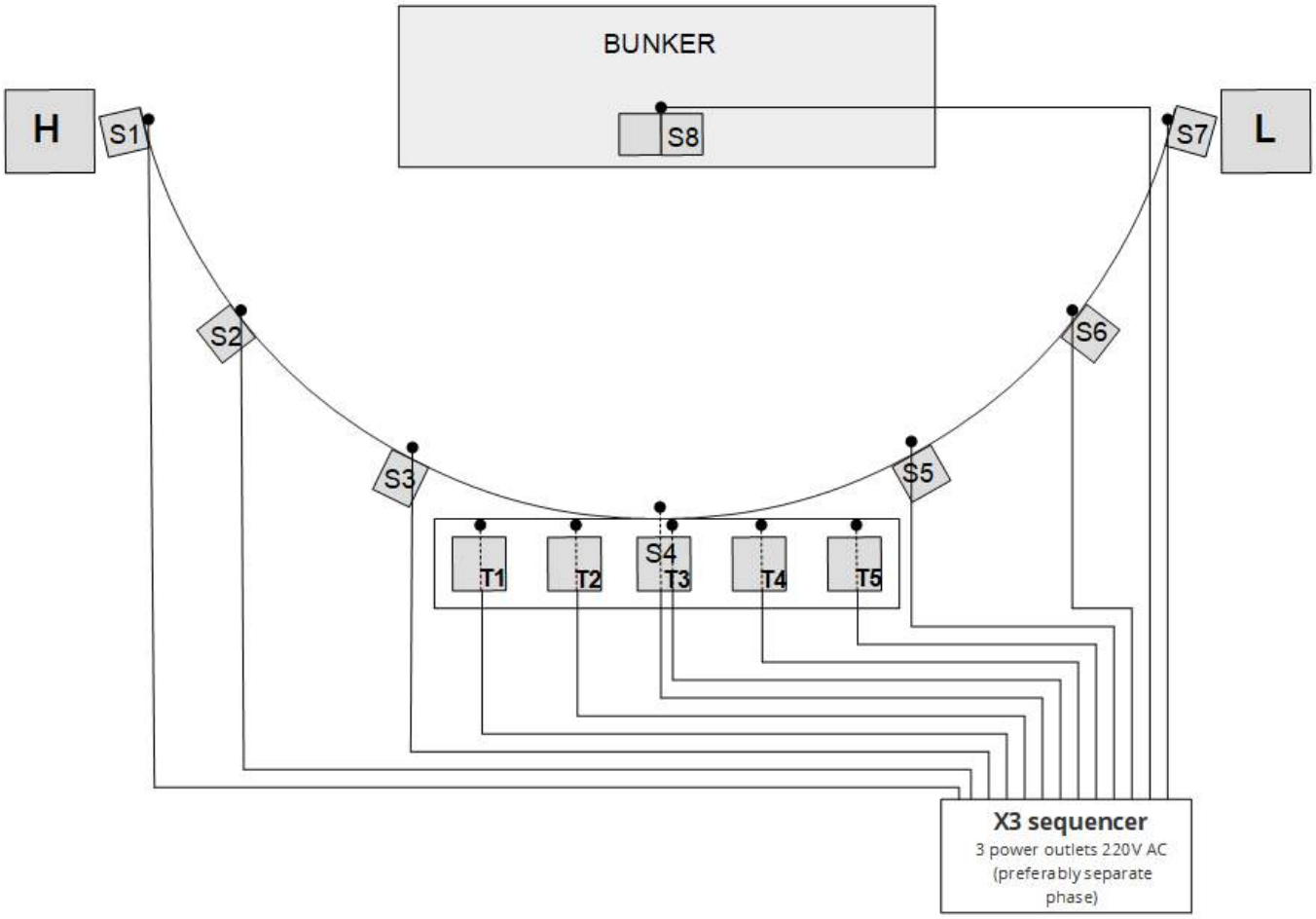
LEGEND

CAT7 S/FTP microphone cable (with 4 wires: orange/white, green/white, blue/white, brown/white)
x 8 pieces from sequencer to each microphone socket of any station

MICROPHONE CABLES MUST NOT EXCEED 50M IN LENGTH EACH !
MICROPHONE CABLES MUST NOT BE PLACED CLOSE TO POWER LINES !

S1 Connector to microphone on station 1 Skeet

MICROPHONE CABLING SCHEME FOR COMBINED TRAP/COMPAK AND SKEET LAYOUT



LEGEND

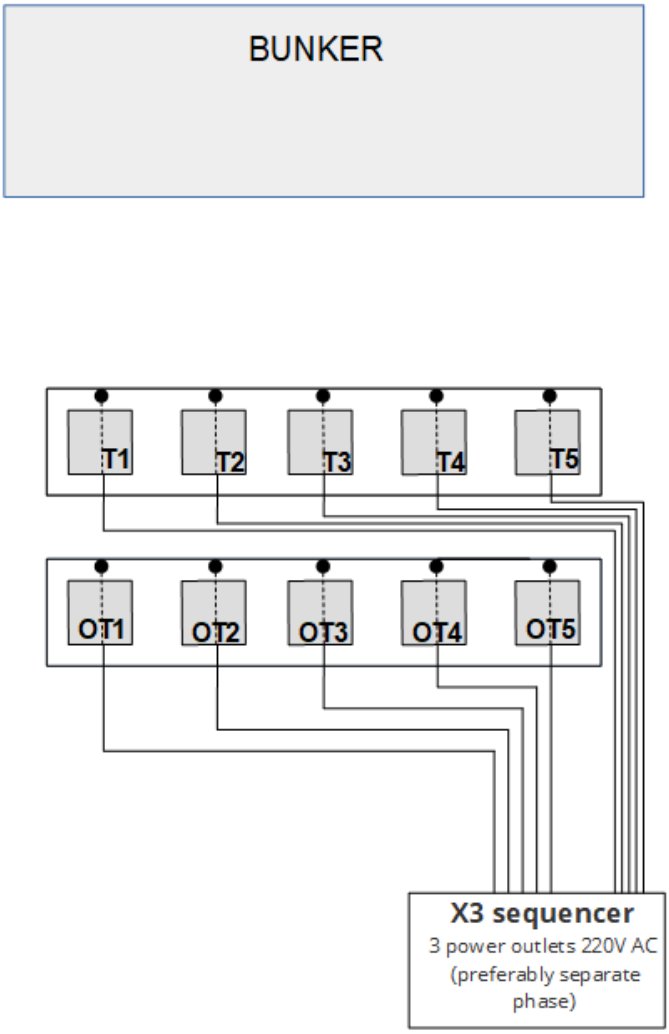
CAT7 S/FTP microphone cable (with 4 wires: orange/white, green/white, blue/white, brown/white)
x 13 pieces from sequencer to each microphone socket of any station

MICROPHONE CABLES MUST NOT EXCEED 50M IN LENGTH EACH !
MICROPHONE CABLES MUST NOT BE PLACED CLOSE TO POWER LINES !

S1 Connector to microphone on station 1 Skeet

T1 Connector to microphone on station 1 Trap

MICROPHONE CABLING SCHEME FOR 15 & 10M/11M TRAP & COMPAK LAYOUT



LEGEND

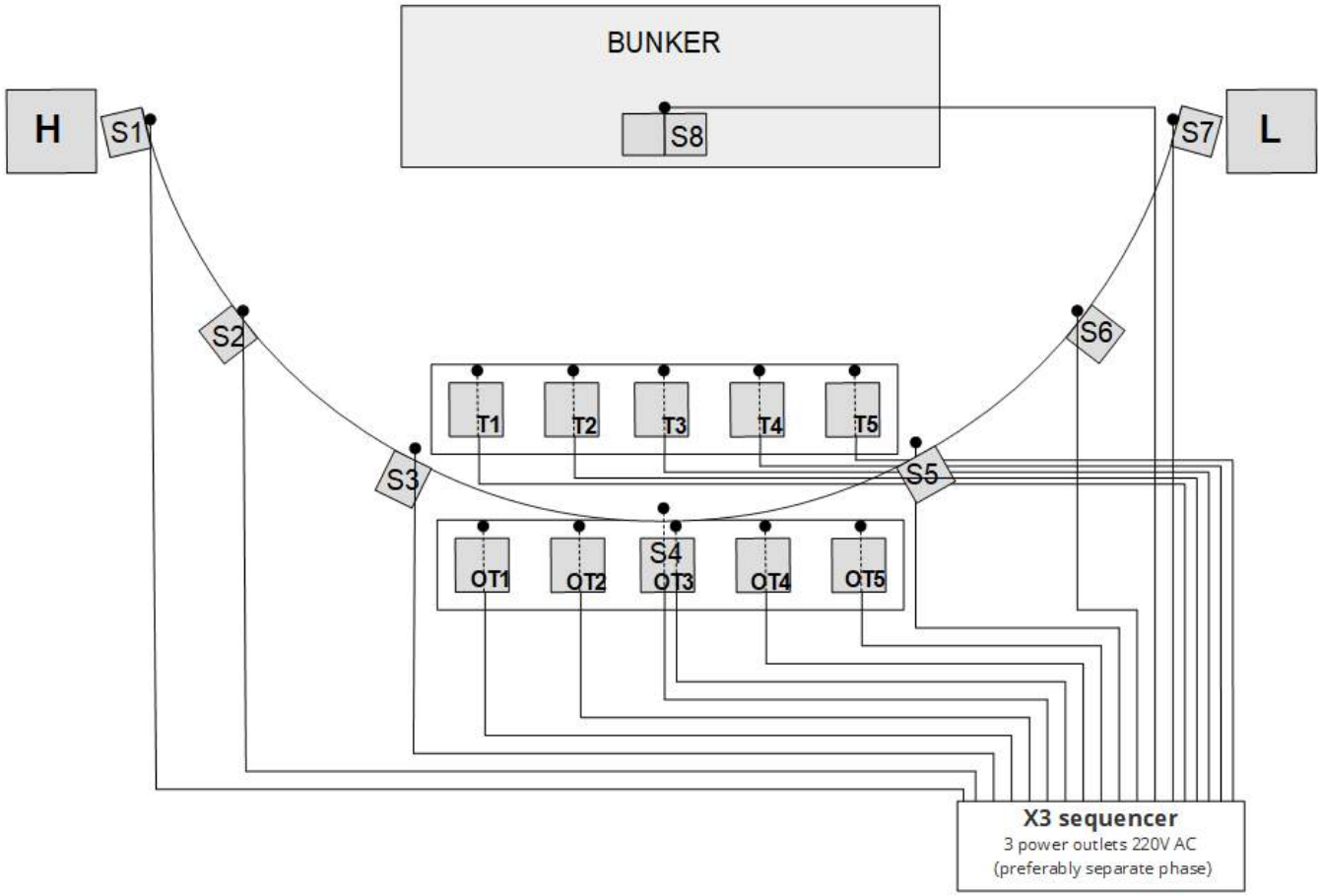
CAT7 S/FTP microphone cable (with 4 wires: orange/white, green/white, blue/white, brown/white)
x 5 pieces from sequencer to each microphone socket of any station

MICROPHONE CABLES MUST NOT EXCEED 50M IN LENGTH EACH !
MICROPHONE CABLES MUST NOT BE PLACED CLOSE TO POWER LINES !

OT1 Connector to microphone on station 1 for Olympic Trap/Compak

T1 Connector to microphone on station 1 for 10m/11m Trap/Compak

MICROPHONE CABLING SCHEME FOR COMBINED 15 & 10M/11M TRAP/COMPAK AND SKEET LAYOUT



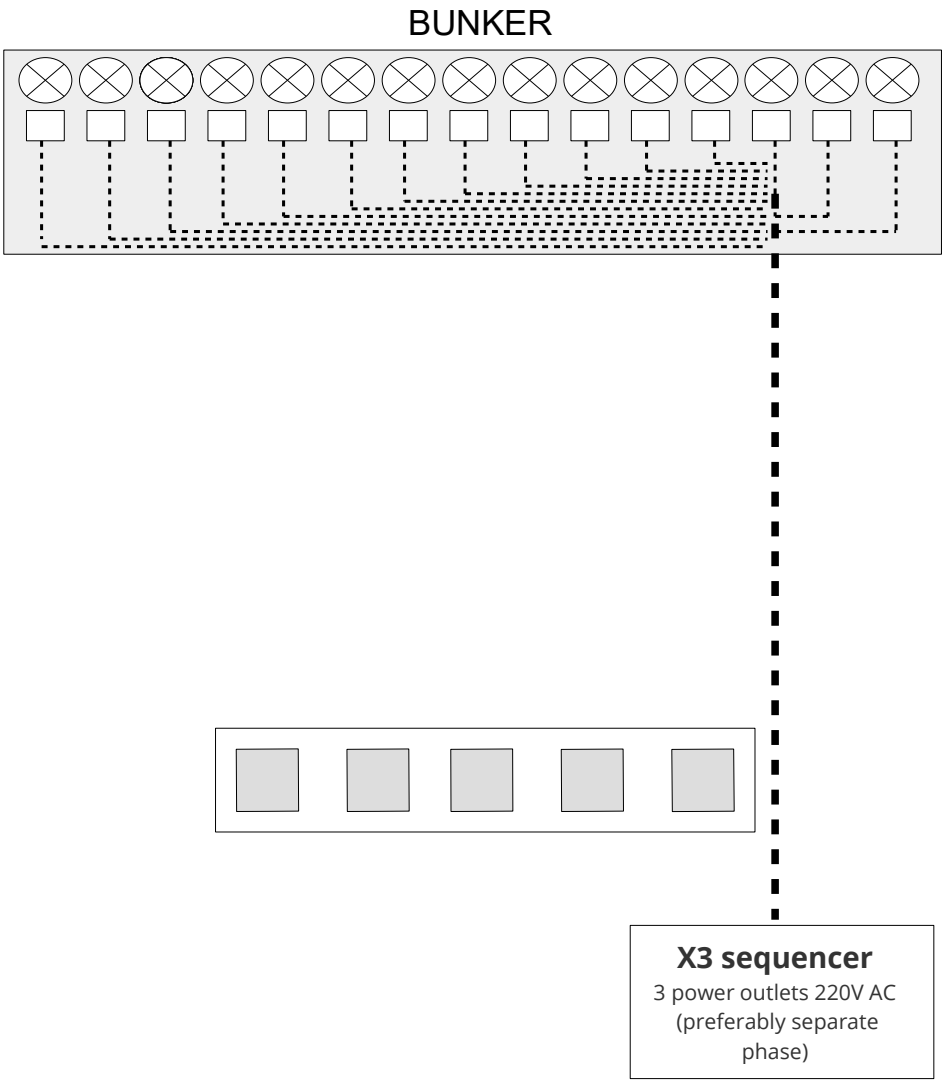
LEGEND

CAT7 S/FTP microphone cable (with 4 wires: orange/white, green/white, blue/white, brown/white)
x 18 pieces from sequencer to each microphone socket of any station

MICROPHONE CABLES MUST NOT EXCEED 50M IN LENGTH EACH !
MICROPHONE CABLES MUST NOT BE PLACED CLOSE TO POWER LINES !

S1	Connector to microphone on station 1 for Skeet
OT1	Connector to microphone on station 1 for Olympic Trap/Compak
T1	Connector to microphone on station 1 for 10 m Trap/Compak

TRAP RELEASE CABLING SCHEME FOR TRAP LAYOUT

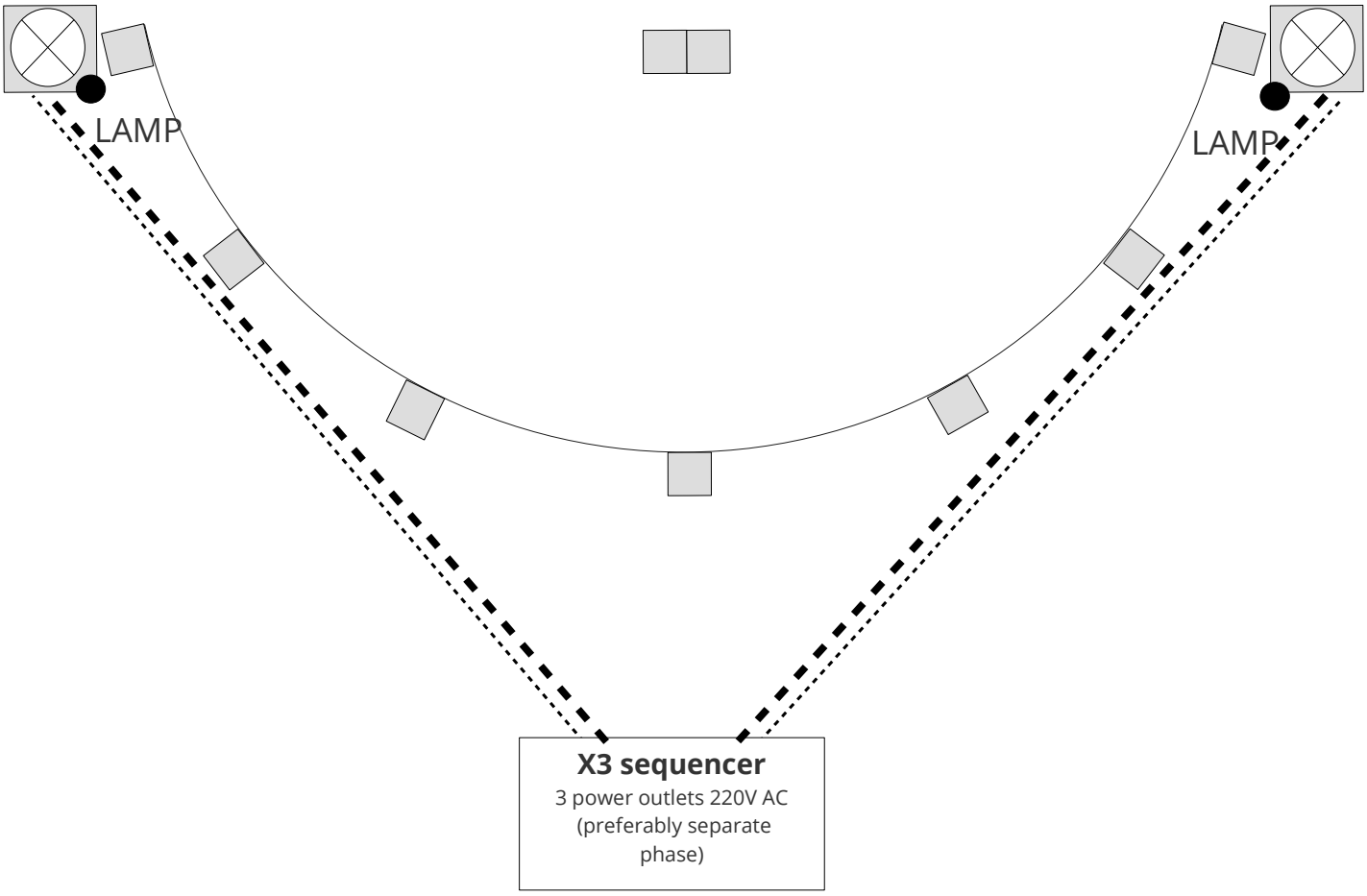


LEGEND

- Trap release cable, 21 wires, dimension: 0,75mm²
- Wires, 0,75mm²
- Trap
- Junction box

Cables go from sequencer to each trap/junction box of any trajectory

TRAP RELEASE/LIGHT CABLING SCHEME FOR SKEET LAYOUT



LEGEND

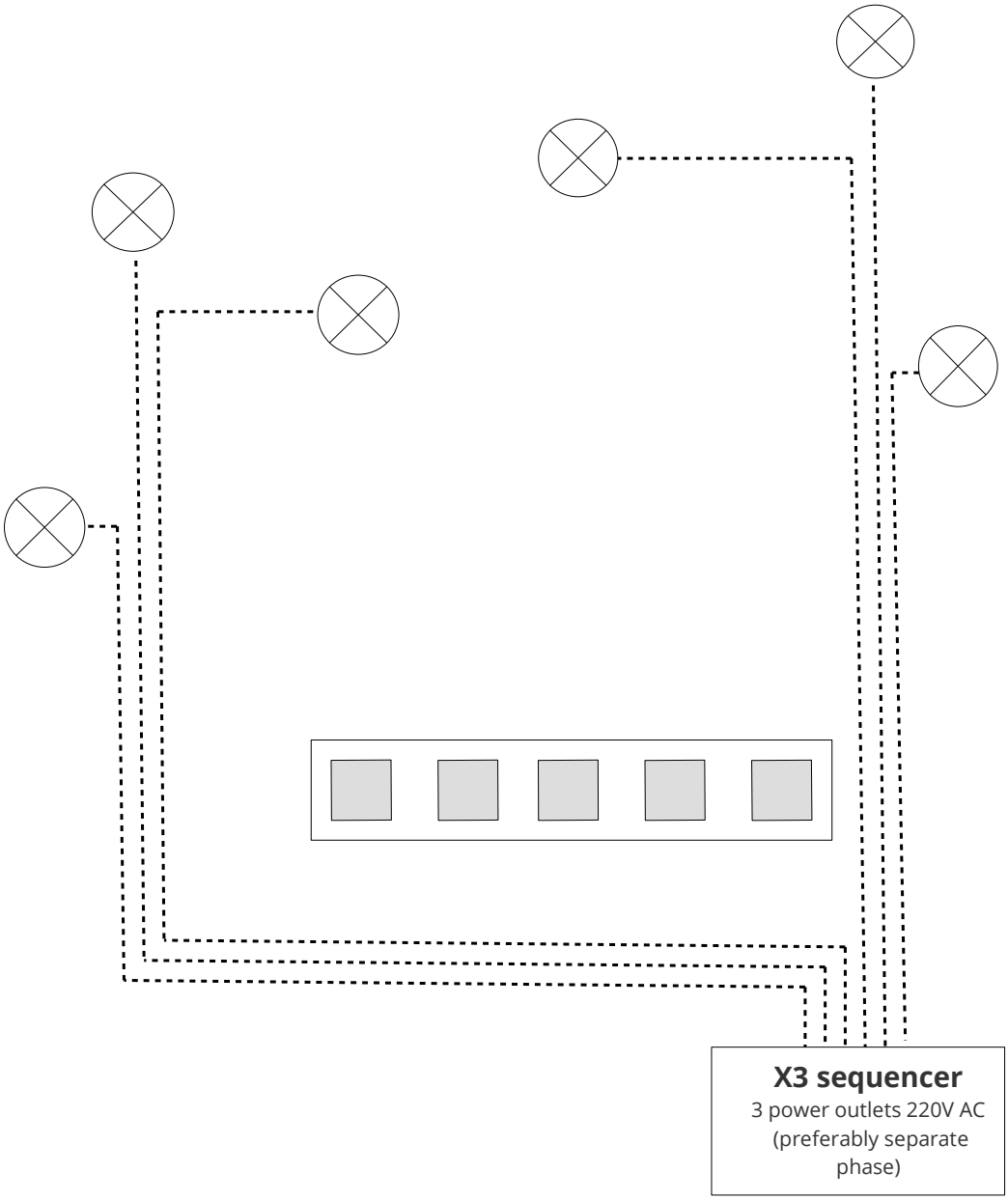
Trap release cable, 2 wires, dimension: 0,75mm² or 1.5mm²

Skeet trap

Lamp activation cable, 2 wires, dimension: 0,75mm²

Cables go from sequencer to each trap/junction box of any trajectory
You might need a 2-relay box both in High House and Low House.

TRAP RELEASE CABLING SCHEME FOR COMPAK LAYOUT



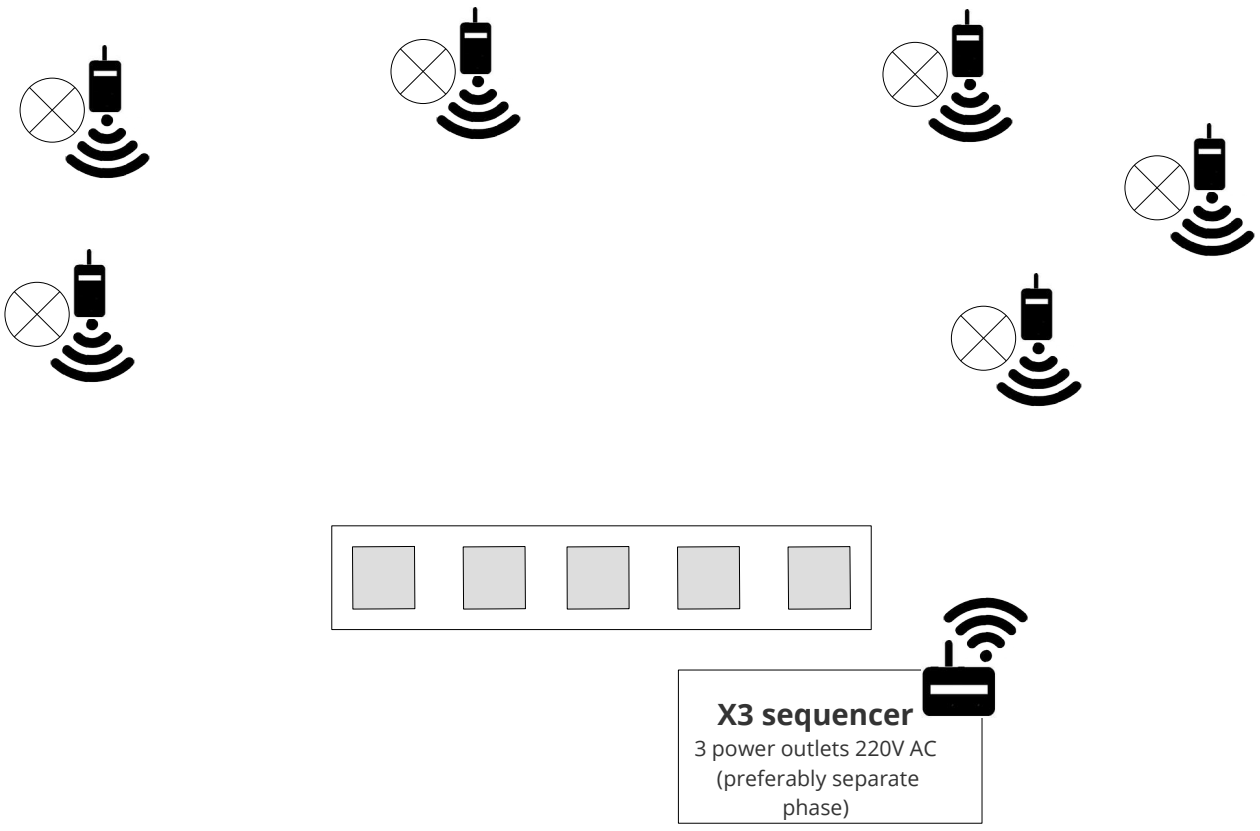
LEGEND

Trap release cable, 2 wires, dimension: 0,75mm² or 1.5mm²

Sporting trap

Cables go from sequencer to each trap/junction box of any trajectory

WIRELESS TRAP RELEASE SCHEME FOR COMPAK LAYOUT



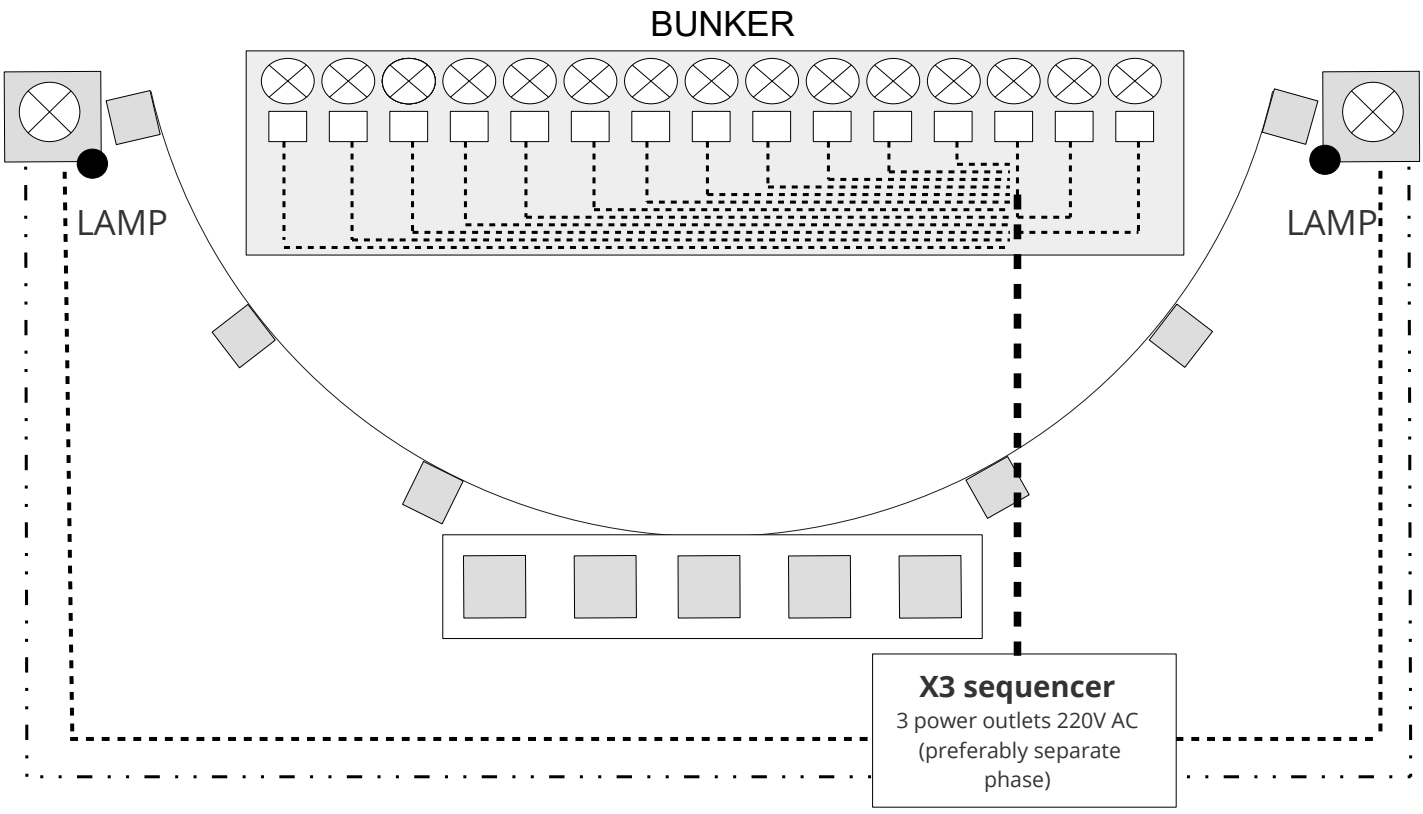
LEGEND

Trap

Wireless smart receiver SR4S or RXU

Wireless release module “Buran"

TRAP RELEASE AND LIGHT CABLING SCHEME FOR COMBINED TRAP AND SKEET LAYOUT

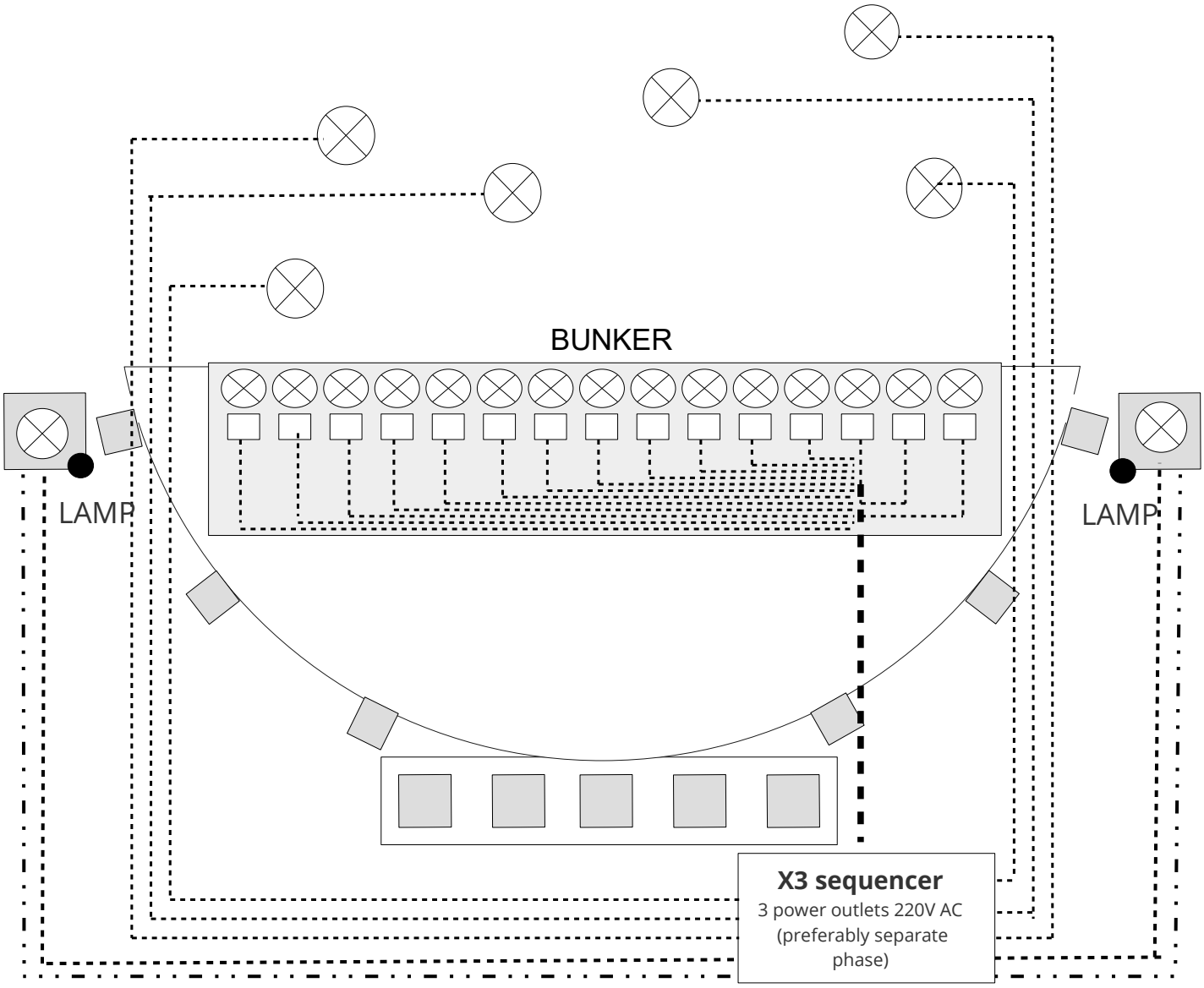


LEGEND

- Trap release cable, 21 wires, dimension: 0,75mm²
- Wires in bunker, 0,75mm²
- Skeet lamp wires, 2 x 0,75mm²
- Skeet release wires, 2 x 0,75mm²
- Trap
- Junction box

Cables go from sequencer to each trap/junction box of any trajectory
You might need a 2-relay box both in High House and Low House.

TRAP RELEASE AND LIGHT CABLING SCHEME FOR COMBINED TRAP, COMPAK AND SKEET LAYOUT

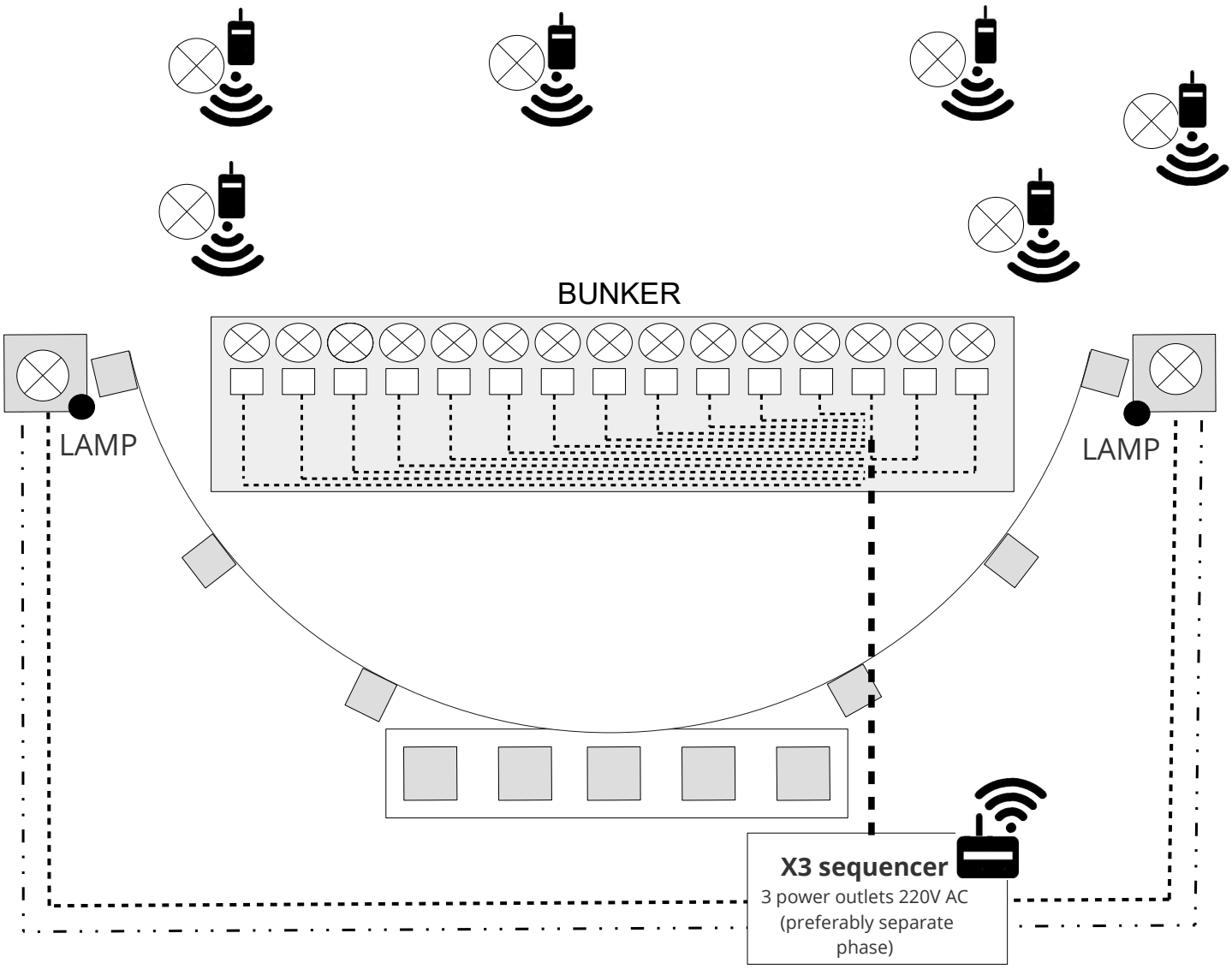


LEGEND

- Trap release cable, 21 wires, dimension: 0,75mm²
- Wires, 0,75mm²
- Skeet lamp wires, 2 x 0,75mm²
- Skeet release wires, 2 x 0,75mm²
- Trap
- Junction box

Cables go from sequencer to each trap/junction box of any trajectory
You might need a 2-relay box both in High House and Low House.

TRAP RELEASE AND LIGHT CABLING SCHEME FOR COMBINED TRAP, SKEET & COMPAK (WIRELESS) LAYOUT



LEGEND

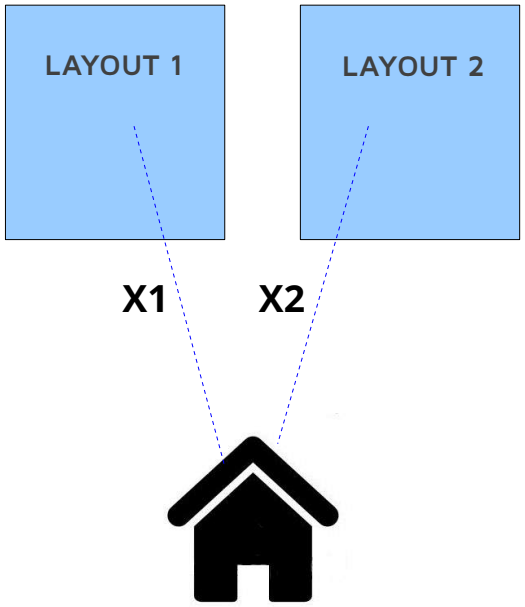
- Trap release cable, 21 wires, dimension: 0,75mm²
- Wires, 0,75mm²
- Skeet lamp wires, 2 x 0,75mm²
- Skeet release wires, 2 x 0,75mm²
- Trap
- Junction box
- Wireless smart receiver SR4S or RXU
- Wireless release module “Buran"

Cables go from sequencer to each trap/junction box of any trajectory
You might need a 2-relay box both in High House and Low House.

Rangemaster Systems supplies fibre **optical cables, network cables and microphone cables are supplied either by customer or by Rangemaster Systems on request.**

That's why we need the customer to **send us information about the length of the cable from** each place on the layout where **X3 sequencer** will be placed **to** the place where **server** will be placed **plus 3m.**

Usually it takes up to 2-3 weeks to get them ready !



CLUB HOUSE

X1, X2,.. - Length of optical cable from server to X3 sequencer +3m

NOTE: Max length for optical cables is 2-20 km (depends on the type of media converter used).

Pipes for optical cables:

D=75mm

If pipes placed above ground they should be with UV-protection!

Microphone and trap cables need standard grey pipes

PLEASE, AVOID CABLES BEING UNPROTECTED/ UNCOVERED BY PIPES ABOVE/UNDER THE GROUND.

For convenience, you can make a junction box opposite the third position on trap layout, from where pipes will go to microphones and signal lamps.

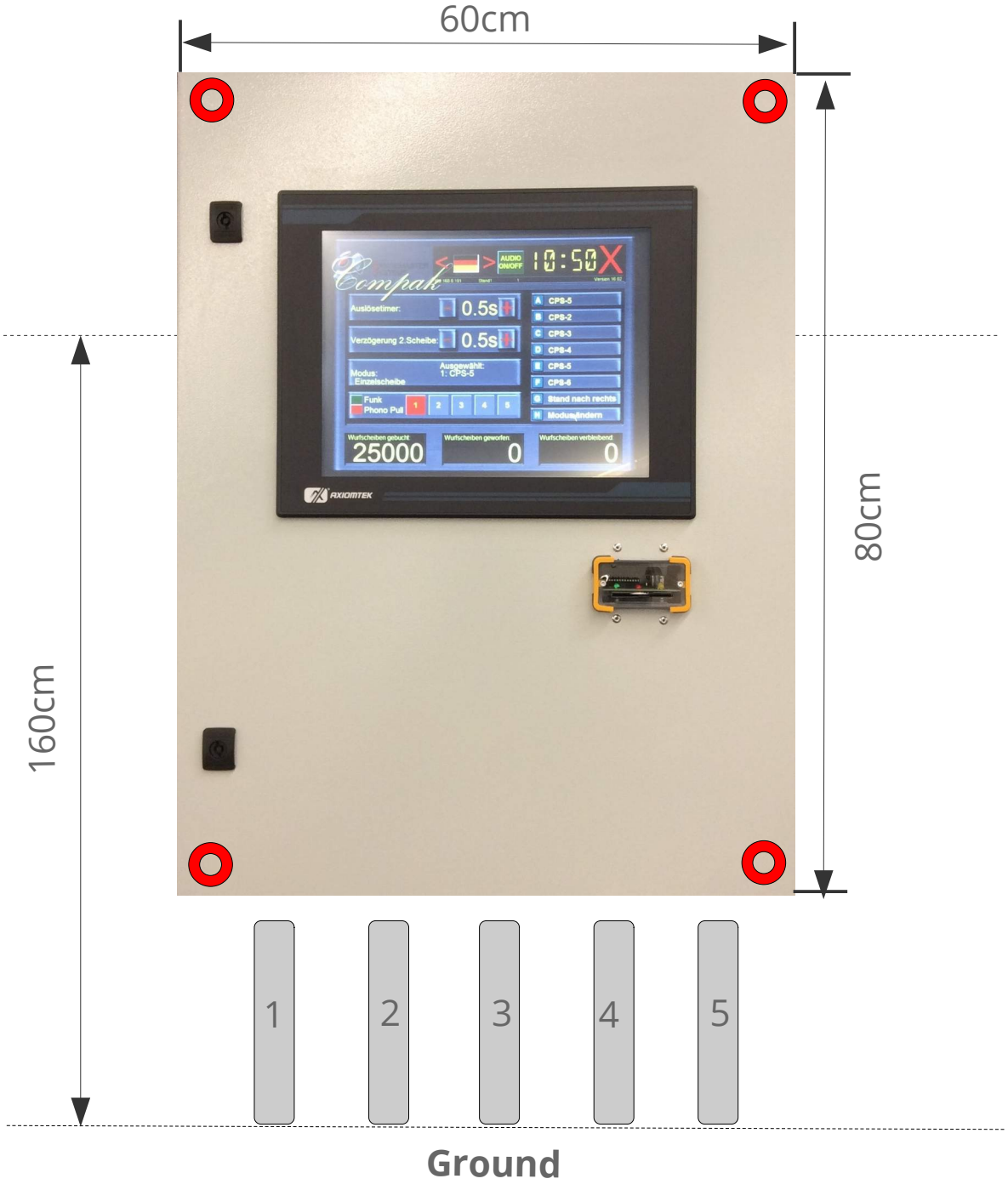
You can take a plastic box and make holes in it for pipes and connect with cable glands (at your discretion).

INSTALLATION

When preparing a place to mount the sequencers, take into consideration that:

1. It should be protected form rain, sun and preferably from sandy winds (max t=+60C; min t=-30C);
2. It should be placed close to the layout so referees can use the touch screen on the sequencer during competitions (also it shouldn't be placed far from the layout because the **maximum length of the microphone cable is 50m**).
3. To have sequencers protected from weather conditions and vandals you can make a protective box with lock or just a shield.

MOUNTING OF X3 SEQUENCER



LEGEND

- mounting holes on the back side of the sequencer

Pipes:

1 – cables for releasing traps
2-3 – microphone cables
4 – scoreboard cables (power and/or data)
5 - power cable (220v) & fibre optical cable

The inside of sequencer

Numbered microphone cables

MICROPHONE CONNECTORS

1. To install microphnes on the layout forst it is necessary to do piping and cabling according to the Microphone cabling scheme.

NOTE:

Do not forget to number the cables from both sides in order to make installation more convenient.

Do not forget about other cables besides for microphones while doing piping !

2. At each position where the microphone is installed, you must install fasteners for outdoor outlets.
For example like it is shown on the pictures 1-3

fig.1

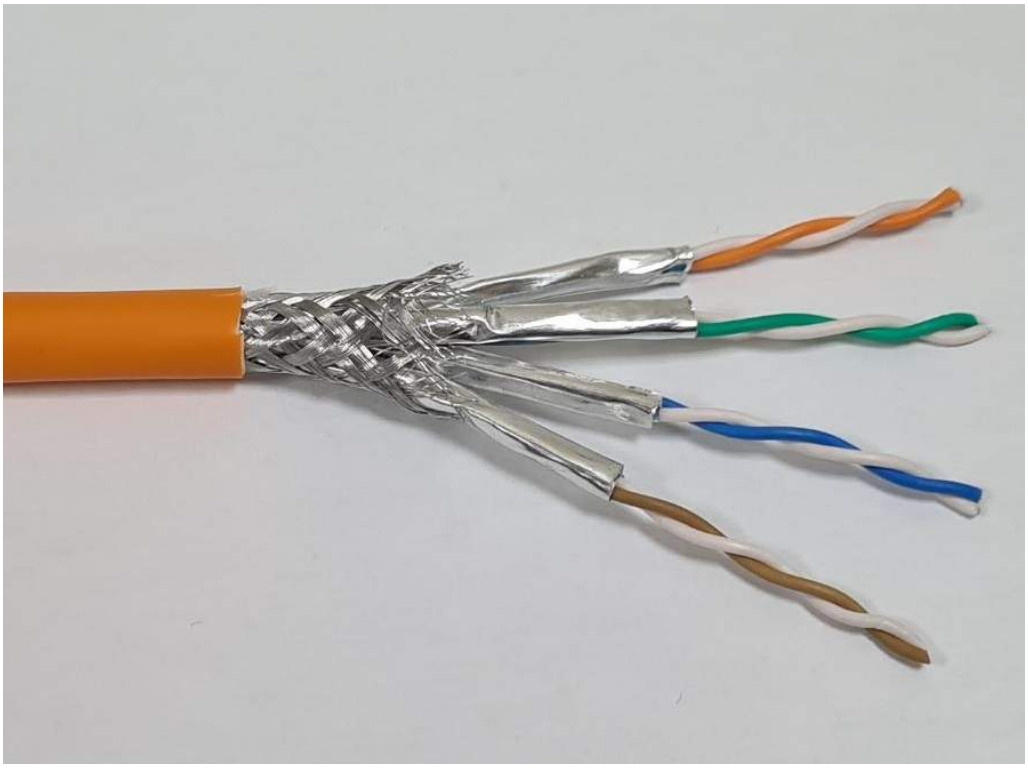
fig.2

fig.3

Cable connection to the sequencer is held under supervision of personnel of Rangemaster Systems.

Microphone cable connection

Microphone cables are to be connected to the socket, which connects to X3 sequencer via cable supplied.
For compatibility, customer can use CAT7 S/FTP microphone cable.



For connecting we use only 3 pairs of wires: brown/white, green/white, blue/white. The orange/white pair of wires is not used.

3. Connect the cables coming from the sequencer as shown in fig. 3

fig.3

L - brown/white wire
E - green/white wire
N - blue/white wire

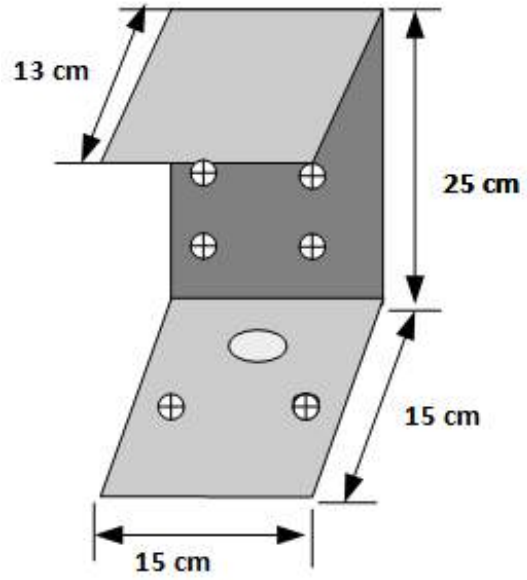
4. Connect the cables of microphones to the attachment cap as shown in fig. 4

fig. 4

L - brown wire
E - yellow/green wire
N - blue wire

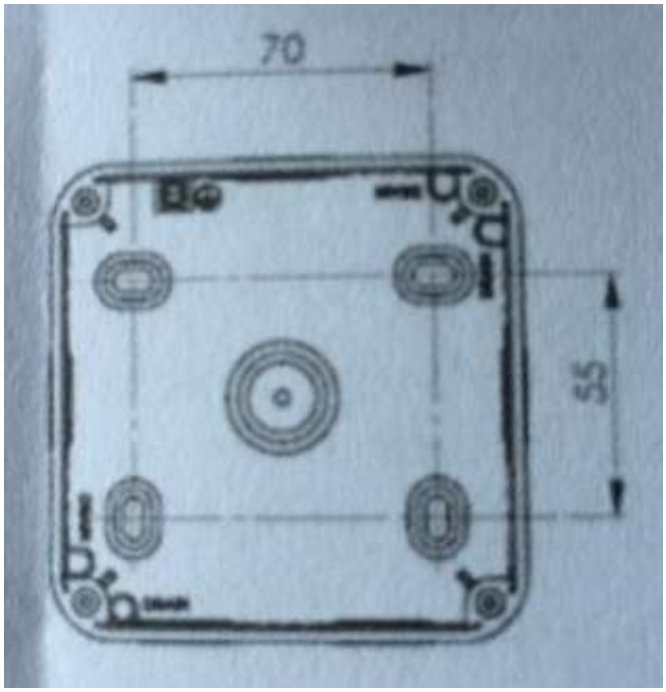
As microphone cables we strongly recommend to use **CAT7 S/FTP cable.**

Exaple for fasteners for outdoor outlets



It aslo possible to order holders from us.

Dimentions of back side boxes of outdoor outlets (if you buy them from Rangemaster Systems)



SERVER ROOM

Server room/place is usually a cabinet (with server computer, switch and media converters) where all cables (optical and network) are engaged.

Server cabinet can be placed anywhere in the administrative building or club house, preferably with air conditioning during summer (if it is too hot) and ith access to the administrator only!

Requirements:

- Separate power supply not connected to other circuits.
- Monitor, mouse and keyboard.
- 19'' cabinet can be supplied on demand.

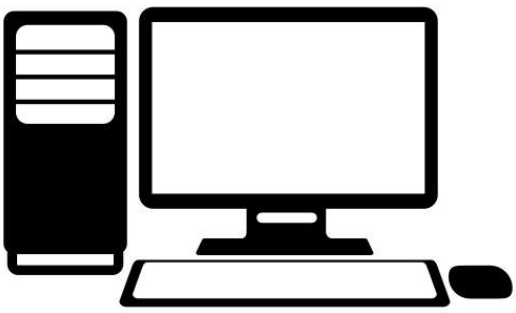
Please, check other options supplied by us

ADMINISTRATIVE COMPUTER

It is necessary to have a place for the administrative computer(s) for administrator to work with the system and set up competitions.

To be able to print score sheets, results, BIB numbers it is necessary to attach a printer.

It is better to have a separate space to limit access to administrative computer so administrator isn't disturbed during competitions .



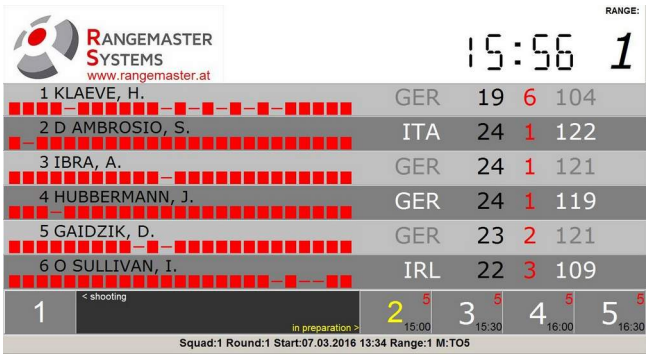
RANGEVIEW MONITORS

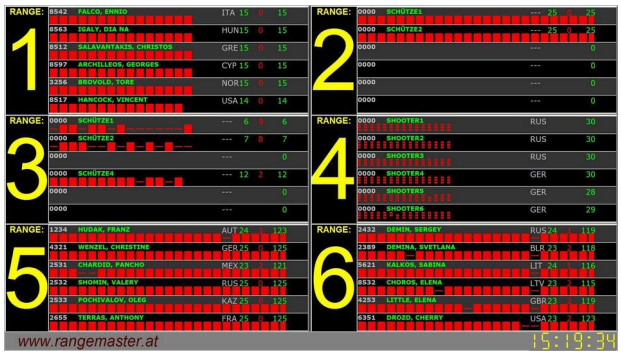
Rangeview monitors are used to show results of the shooting: online shooting process, scratch results, results according to classes/categories, team results.

For that you can use rangeview computers and monitors of any size. It is also possible to use projector to show results (**NOTE:** it should be HD projector)

We supply computers only!

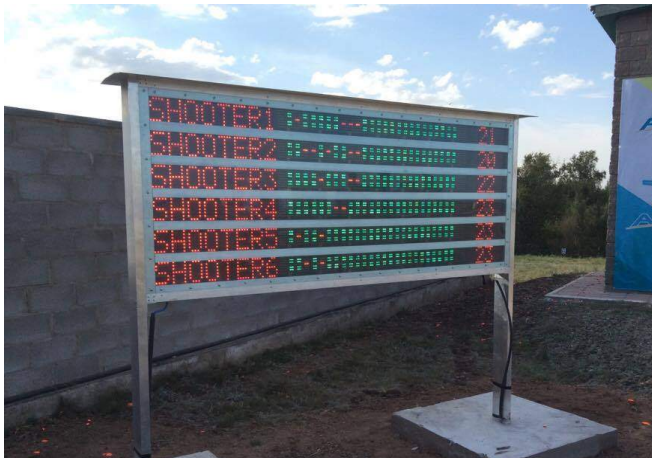
Customer should supply monitors/projectors, network and VGA cables and mount monitors where he wants to have Rangeview results (ex.:hall, restaurant, rest place, club house, etc.)

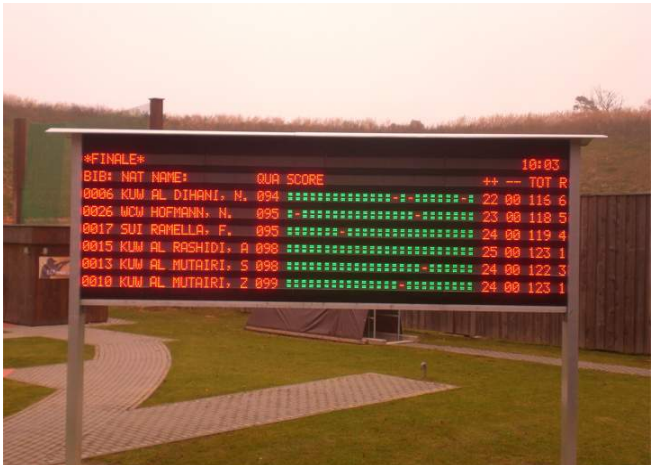


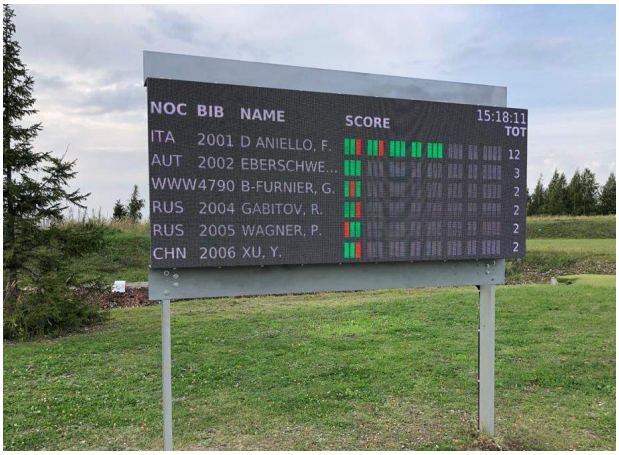


SCOREBOARDS

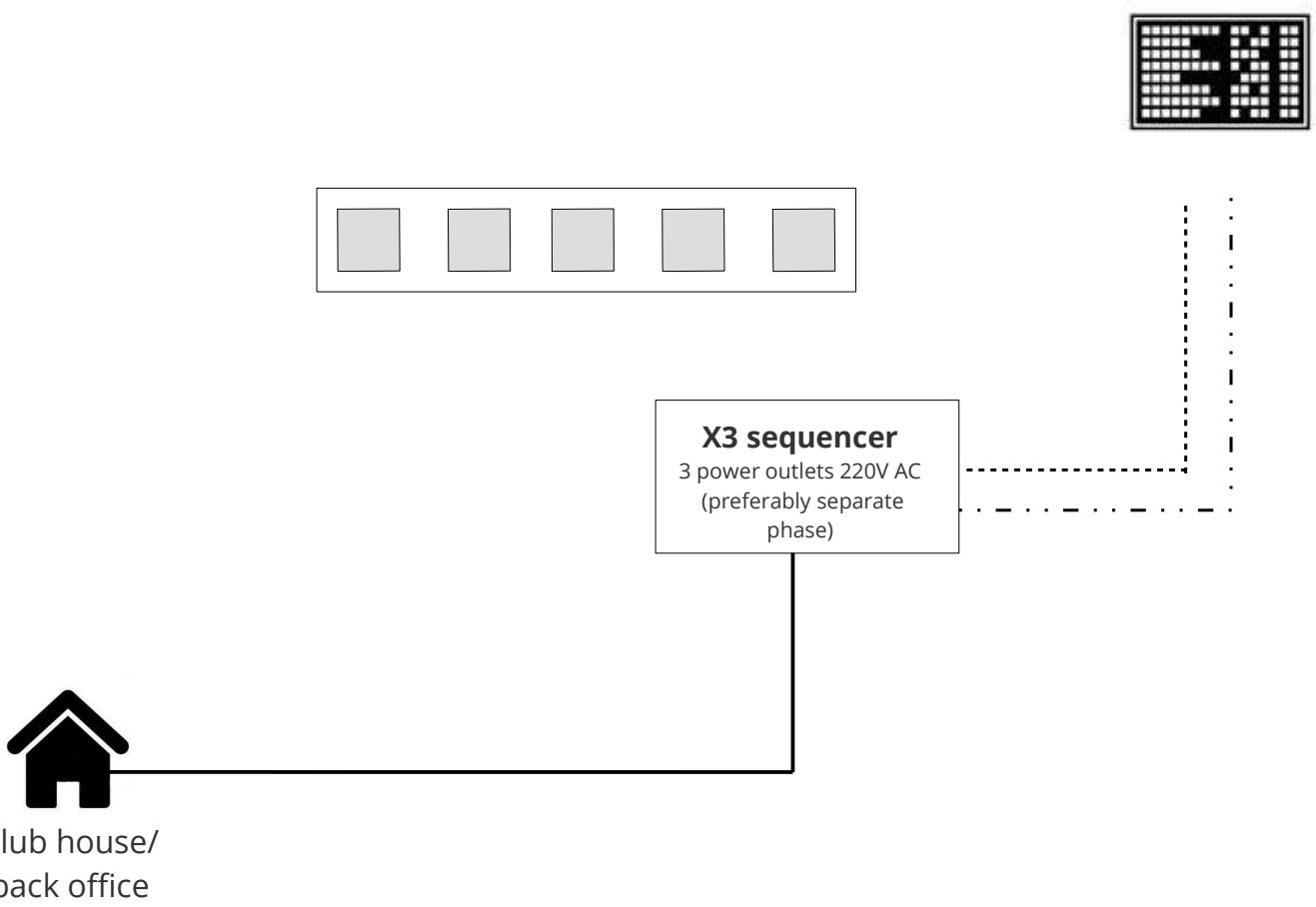
Customer should choose the place for scoreboards and correct angle to make it convenient for shooters, referees and spectators to see results during competitions.







POWER AND DATA CABLING FOR SCOREBOARDS



LEGEND

LED Scoreboard (SCMINI, SCMIDI, SCMEGA)

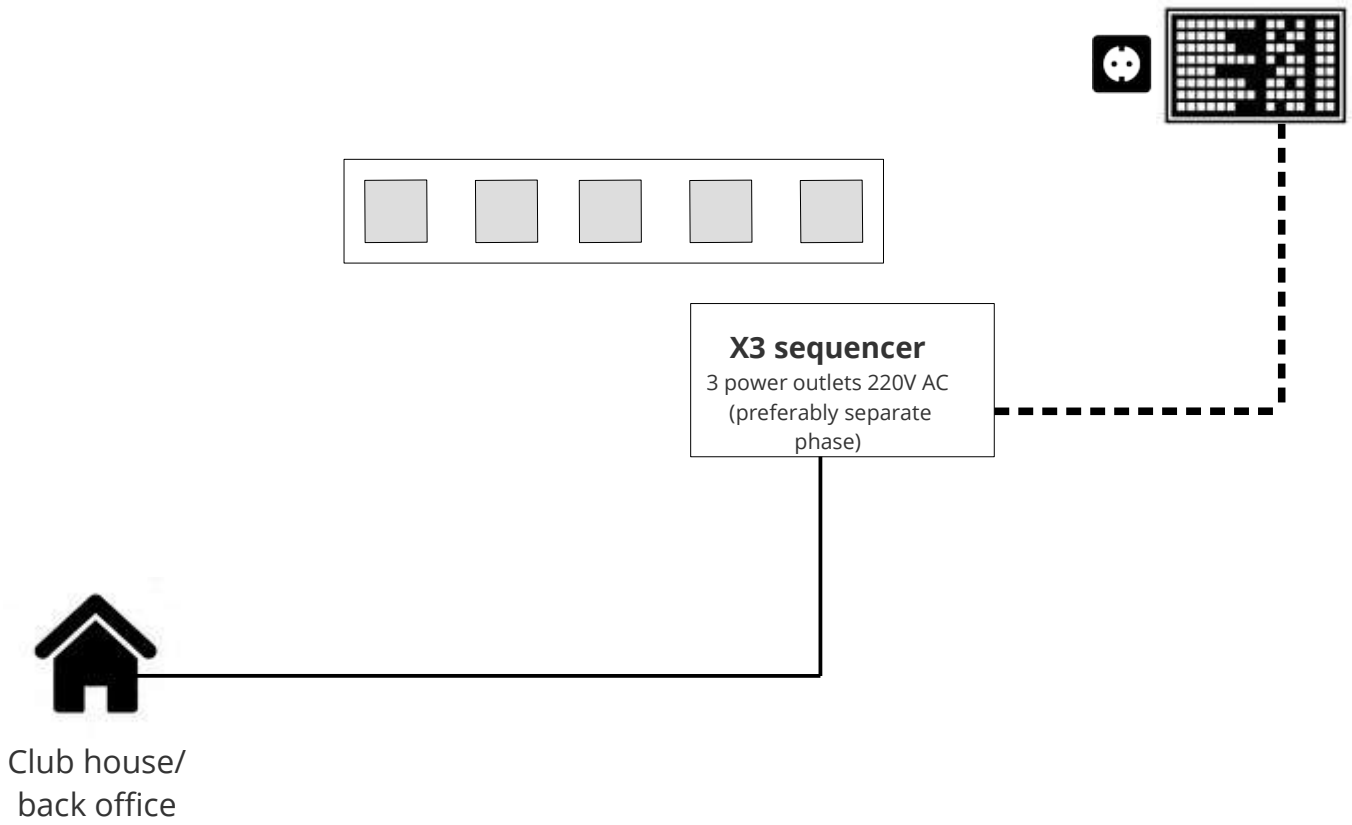
CAT7/SFTP cable

3 x 2.5mm² power cable (from scoreboard to X3 PRO/.Net to provide lower voltage protection)

Fibre optical cable/ Single mode/ which goes to back office/club house

Data cable must not be placed close to power cable (distance 0.5m min)

POWER AND DATA CABLING
FOR HI-RES SCOREBOARD SCLEDMD/SCLEDMD-PRO



LEGEND

LED qualification scoreboard - 1x2.5m (SCLEDMD) or 1x3m (SCLEDMD-PRO)

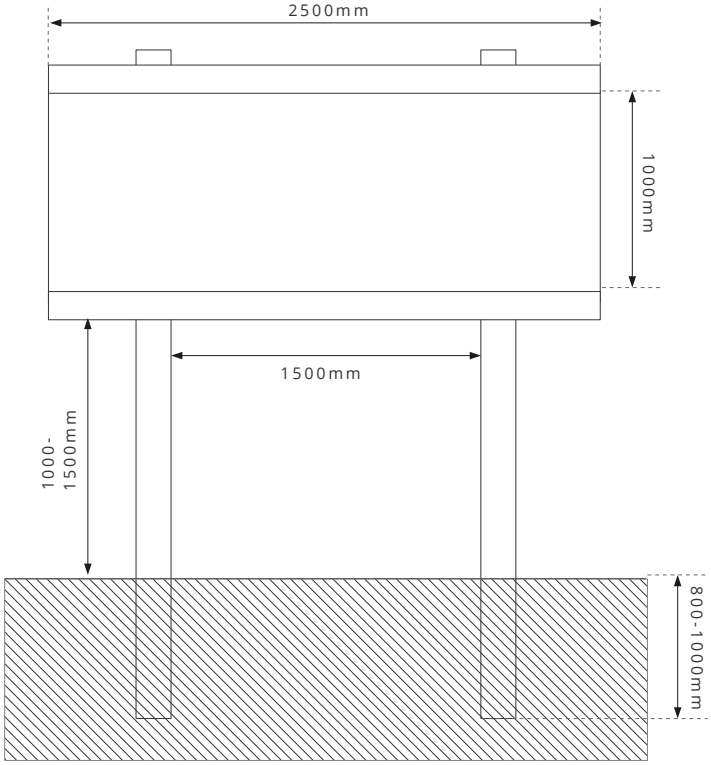
1 cat 7 network cable (from X3 PRO/.Net to Scoreboard)

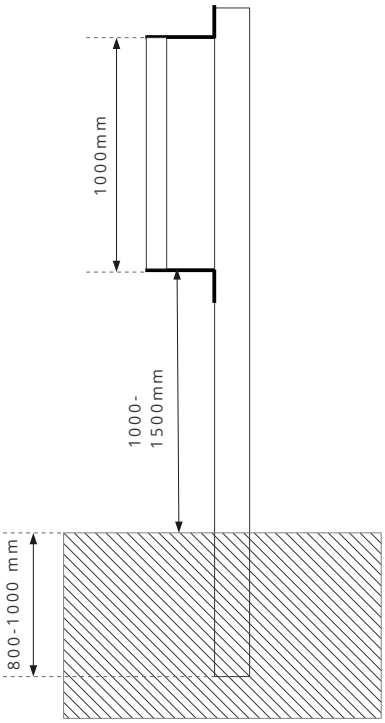
Fibre optical cable/ Single mode/ which goes to back office/club house

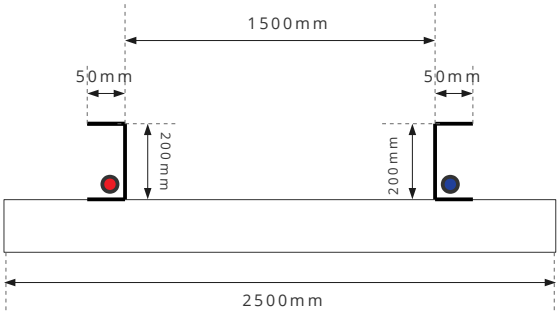
Power supply for scoreboard 220V, 4-6 kWh

Data cable must not be placed close to power cable (distance 0.5m min)
Cables may go in parallel 1m max

POWER AND DATA CABLING
FOR HI-RES SCOREBOARD SCLEDMD



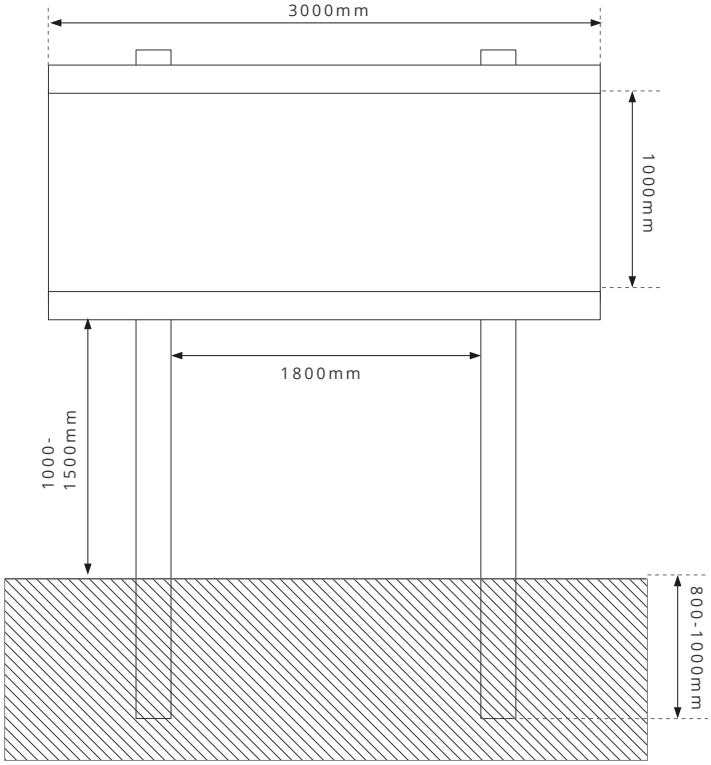


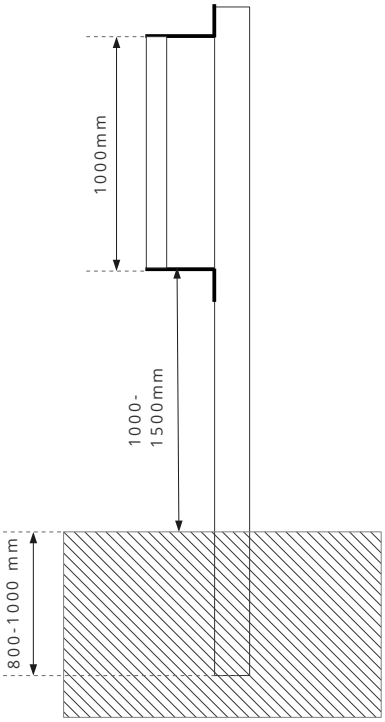


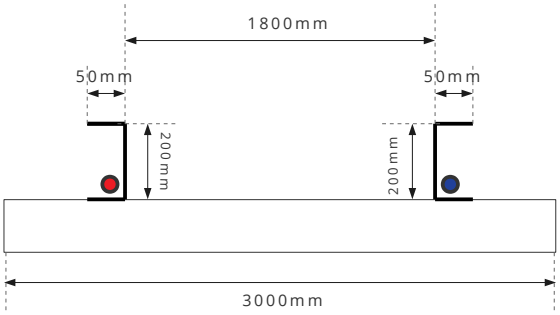
LEGEND

- Concrete base support
- Power cable pipe 50 mm; Cable: 3x2.5 mm² (PE/N/L)
- Data cable pipe 50 mm; Cable: CAT7 S/FTP
- Iron U-frame, 3 mm or Alloy U-frame, 4 mm

POWER AND DATA CABLING
FOR HI-RES SCOREBOARD SCLEDMD-PRO



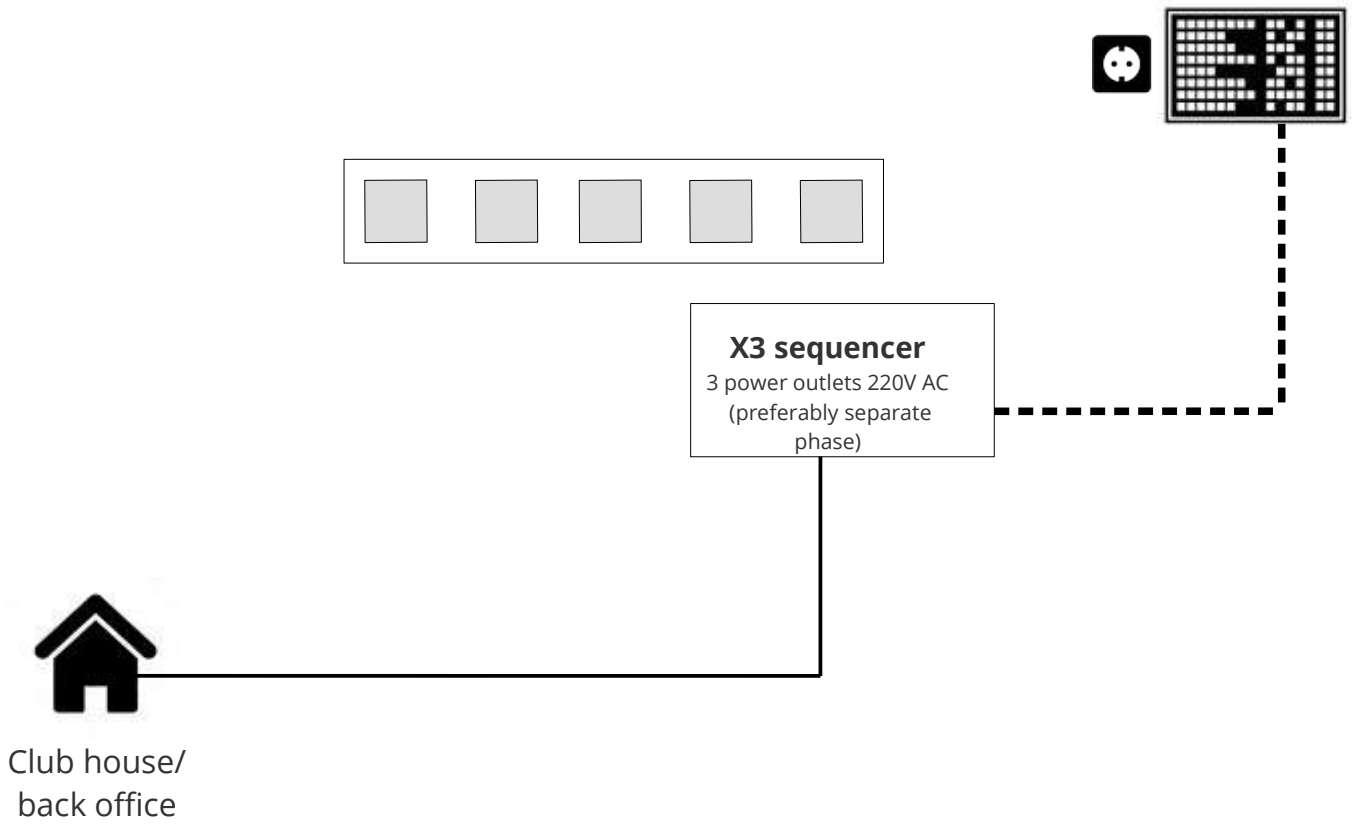




LEGEND

- Concrete base support
- Power cable pipe 50 mm; Cable: 3x2.5 mm² (PE/N/L)
- Data cable pipe 50 mm; Cable: CAT7 S/FTP
- Iron U-frame, 3 mm or Alloy U-frame, 4 mm

POWER AND DATA CABLING FOR FINAL SCOREBOARD SCLEDBG



LEGEND

LED final scoreboard 5x2m (SCLEDBG)

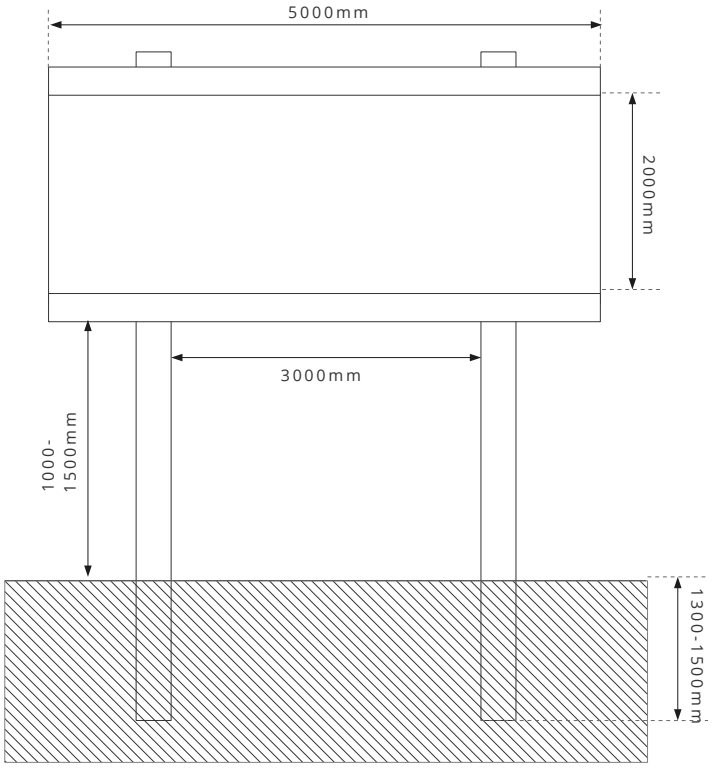
2 cat 7 network cables (from X3 PRO/.Net to Scoreboard)

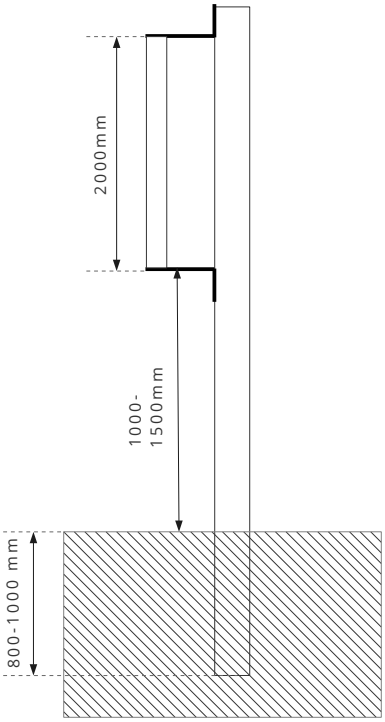
Fibre optical cable/ Single mode/ which goes to back office/club house

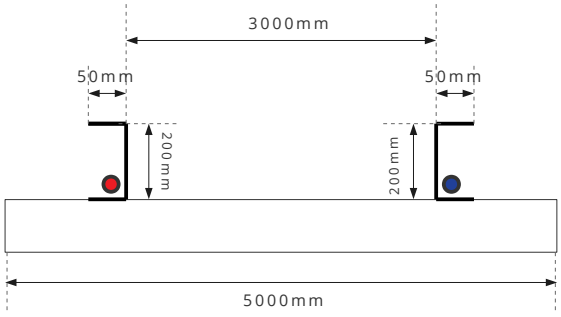
Power supply 220V, 6-8 kWh. 2 x power cable 4 mm^2 (diameter depends on the length of the cable to the scoreboard)

Data cable must not be placed close to power cable (distance 0.5m min)
Cables may go in parallel 1m max

POWER AND DATA CABLING FOR FINAL SCOREBOARD







LEGEND

- Concrete base support
- Power cable pipe 50 mm; 2 cables: 3x 4 mm² (PE / N / L)
- Data cable pipe 50 mm; Cable: CAT7 S/FTP
- Iron U-frame, 5 mm or Alloy U-frame, 6 mm

SPEAKERS

To provide good sound for shooters, referees and spectators we provide an amplifier and two speakers for each layout.

Customer should prepare two places for installing speakers and provide cabling (2x2,5mm²) from the sequencer to the speakers.

ANTENNA

There is an antenna cable going from the control unit (sequencer) which should go outside.

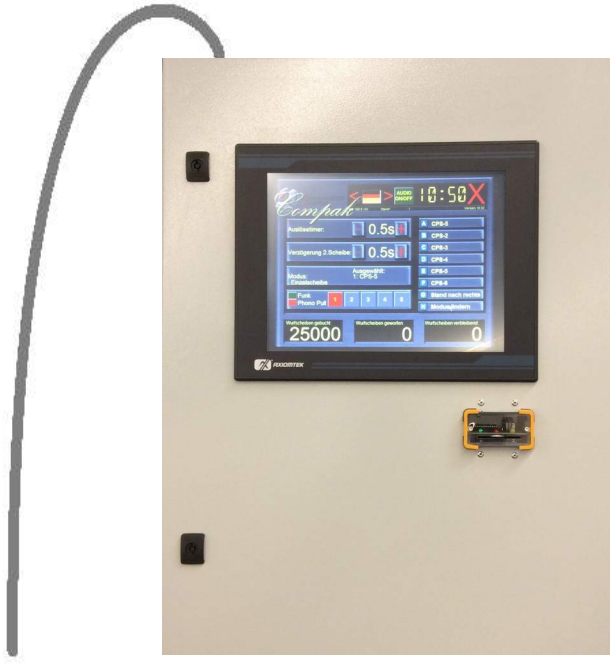
In case the control unit is placed inside the building take care it is possible to pull antenna cable outside. This is required to use the remote control.

Standard cable length supplied with sequencer: 5m.

In case it will be pulled outside it should be longer, customer should tell in advance or buy the necessary length by himself.

Cable type: RG-U 58 with 50 Ohm

The end outside part of 70 cm of shield has to be removed.



ADDITIONAL OPTIONS

CASH ACCEPTOR

It is possible to have a cash acceptor where shooters can buy rounds by themselves

INSTALLATION, TRAINING, STAFF

Final installation is done under supervision and together with Rangemaster Systems staff. It is important that shooting club provides **electrician** who makes the final installation and is able to work with the system in the future after having training.

Also shooting club should have a **personnel** which can have a training how **to work with administrative program and program for running competition**.
Training is also done during and after installation during few days.
We supply all detailed manuals how to work with programs.

Final installation can be finished quickly and in time in case all pre installation is correctly done by a customer!

PRE-ISTALLATION CHECK LIST

№	LIST OF ITEMS TO DO	DONE
1	Choose the place for X3 sequencer	
2	Choose the place for server	
3	Choose place for an administrative computer(s)	
4	Choose places for Rangeview monitors and computers	
5	Choose places for scoreboards (angle, position)	
6	Send the information of the length from server room to each X3 sequencer to Rangemaster manager to be able to order optical cables (should be done well in advance)	
7	Send the information of the length from scoreboards to X3 sequencer to Rangemaster manager (if a full graphic scoreboard will be placed on the layout)	
8	Make calculation and buy certain length of cables and pipes necessary for microphones, traps, power cables, cables for speakers	
9	Do piping for optical cable from server room to each sequencer	
10	Do piping for microphones on each layout (from sequencer to each station) NOTE: MICROPHONE CABLES MUST NOT EXCEED 50M IN LENGTH EACH! MICROPHONE CABLES MUST NOT BE PLACED CLOSE TO POWER LINES!	
11	Do piping from trap junction box to sequencer	
12	Do piping for skeet lamp skeet lamp from skeet houses to sequencer (if it is a skeet or combined layout)	
13	Do piping from scoreboard to sequencer for data cable which is supplied by Rangemaster System	

№	LIST OF ITEMS TO DO	DONE
14	Do piping from scoreboard to sequencer for power cable (if there is a scoreboard on the layout) or provide a power supply NOTE: DATA CABLE MUST NOT BE PLACED CLOSE TO POWER CABLE (DISTANCE 0.5M MIN) CABLES MAY GO IN PARALLEL 1M MAX	
15	Do piping for speaker cables if necessary	
16	Pull cables for microphones on each layout (from sequencer to each station). Always check the length before cutting!	
17	Pull cables from trap junction boxes to X3 sequencer	
18	Pull cables for signal skeet lamps from skeet houses to X3 sequencer (if it is a skeet or combined layout)	
19	Pull cable from scoreboard to X3 sequencer (if you don't use wireless data transmission) for data cable which is supplied by Rangemaster System	
20	Pull cable from scoreboard to X3 sequencer for power cable or provide a power supply (if there is a scoreboard on the layout)	
21	Pull cables for speakers	
22	Prepare places for microphone connectors and install fasteners for outdoor outlets.	
23	Prepare place to mount X3 sequencer box (if necessary make enclosure and pedestals)	
24	Provide electricity (220V) to each place where X3 sequencer is placed	
25	Prepare places for speakers (one on the layout and one close to sequencer)	
26	Check if 5m antenna is long enough otherwise let know Rangemaster administrator which length is necessary	
27	Prepare place for server (if necessary order server box).	
28	Prepare places for administrative computers (table for work place for administrator)	