# 1. Installation and Debugging

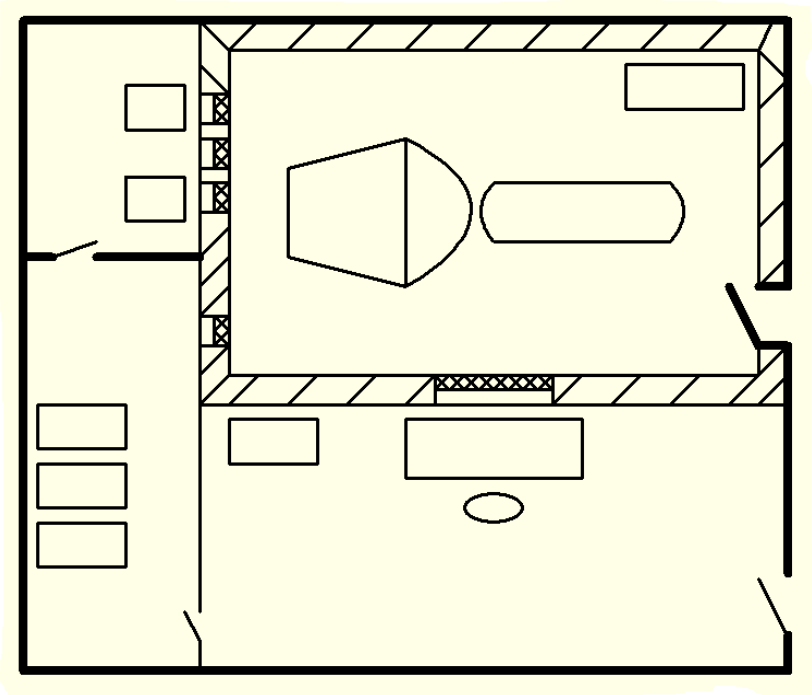
◇ system layout illustration

◇ system installation

◇ system debugging

## 1.1 System Layout Illustration

Typical layout is shown below. Detailed layout differs as per situation. the layout and illustration of the system is carried out by our company engineerd or other engineers authorized by our company after investigating. There are magnet, patient table, coil, laser localizing system and so on. In the equipment room and control room, there are gradient amplifier, spectrograph cabinet, console, camera and so on.



Typical layout

**Note:**

◆ There is high intensity field in the scanning room. Don't move system parts at will after they are installed well. Equipments outside scanning room are forbidden to be moved and used inside.

## 1.2 System Installation

### 1.2.1 Installation of the radio frequency shield room

**Note:**

- The load bearing and stress analyses of the scanning room construction is ensured. It is suggested to evaluate it fully by relevant organizations.

## General specification：5m×6m×3m

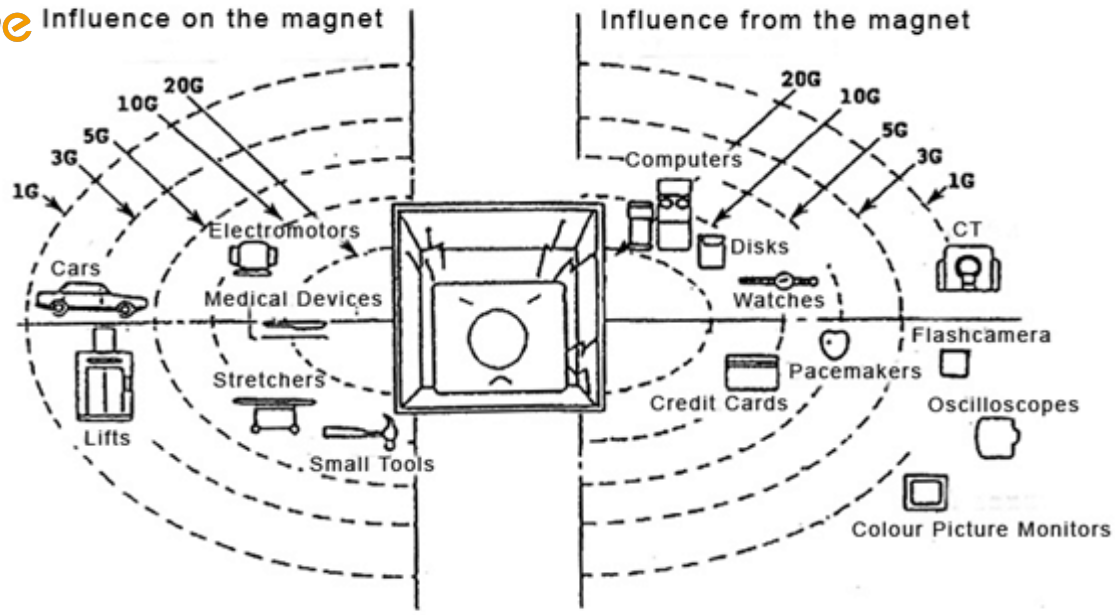
RF shielding plates are made from copper or stainless steel. They are inlayed to the walls, ceiling and floor in the scanning room .Those six planes should all be sealed. RF shielding plates in the floor need to be moisture proof, antisepticizing and insulated. Electromagnetic and signal wires through magnets should all go through signal transfers board to restrain RF interference effectively.

Radio frequency shield room is earthed at one point. Earth resistance should less than 1Ω.

Radiofrequency shield room is decorated luxuriously with wooden floor. Filament lamps are fixed on ceiling and walls indoors.

Two air conditioners are needed for radio frequency shield room. The power should be sufficient. One of the air conditioners is for cooling while the other for heating. They should run day and night continually to keep a temperature at 22ºC±4ºC and humidity between 30%-70%.

For the Magnet temperature control system it requires to run uninterrupted for 24 hours a day to heating magnet and make a constant temperature, the two-way (up and down) of the magnet's temperature is controlled at 28 º C ± 0.1 º C.
It must have a drainage trench around the MR scanning room.
There are not any power cables through the Scanning the room. For they can affect each other between the MR magnetic field, surrounding equipment and environment, the moving large metal and others. There should not have elevators, cars and other large moving metal objects within 30m from the magnet center; and there should not have any ferromagnetic material within 1.5m from the magnet.




The influence of the MR EQUIPMENT on its peripheral equipment

### 1.2.2 Installation of the magnet

**Note:**

- There might be projecting effect around magnetic field. To prevent threat to magnet and personal safety from ferromagnetic projectiles, the transportation of magnet should be handled or instructed by our technicians. Please read closely the relevant safety notice.
- Magnet weight is 27000Kg at least; please note the reliability of lifting tools. And the base strength for magnetic body should be affirmed in advance!

Professional hoisting company can be hired for the installation of the magnet. The magnet should be installed in the designed position in the radio frequency shield room and please ensure stable transportation and installation, no impact, no excessive vibration of the magnet. And especially magnet should not be tilted during hoisting. And there should no ferromagnetic object within 2.5 meters around the magnet during transportation and installation. For transportation and installation personnel, do let approach the magnet with their mobile telephones, magnetic cards, heart pacemakers to avoid unwanted aftermath.

### 1.2.3 Installation of gradient coil

The upper and lower gradient coils should be fixed on the polar plate of the upper and lower loading ends. Gradient boards are quite heavy and beware that do not knock and break the field even bars on the polar plate during installation.

### 1.2.4 Installation of transmitting coil

Transmitting coil consists of two flatbed coils. There is a tuning board receptacle on each flatbed coil. Fix the two flatbed coils on the upper and lower gradient boards with screws and ensure the tuning board receptacles are on the same side.