



Indian Magnetic Resonance Imaging



- Magnetic Resonance Imaging (MRI) is very effective imaging technique used to visualize internal soft tissue structures of the body with high contrast images. MRI can create 3D high resolution images which helps in diagnosing a broad range of conditions, including cancer,

heart and vascular disease, and muscular and bone abnormalities. MRI can detect abnormalities that might be obscured by bone with other imaging methods.

- SAMEER along with its collaborating partners IUAC, CDAC & MIRC has designed and developed 1.5 Tesla MRI system with individual sub-systems like superconducting magnet assembly, High power Amplifier, RF Coils, Spectrometer, Imaging & Visualisation software and integrated complete system to acquire images of objects.

Specification of the Indigenous 1.5T MRI

PARAMETERS	SPECIFICATIONS
Magnetic Field	1.5 Tesla
Frequency of Operation	63.8668 MHz
Bandwidth	6 kHz to 600 kHz (Variable)
Transmitted Power	15 kW Peak (Max.)
No. of Rx. Channels	16
Imaging Coil Types	• Body, Head and Knee Bird Cage Coil • 12 Channel Head(8)-Neck(4) Coil • 14 Channel Array Coils Embedded in the Couch Assembly (Posterior Coil/Spine Coil, 8 Ch) and Overlay (Anterior, 6 Ch.) • General Purpose Flexible 4 Ch. Array Coil • 2", 3" and 5" Single Ch. Coil
Imaging Sequences	GRE, SE, IR, EPI(GRE/SE), TSE/FSE, DWI, STIR, FLAIR, GRAPA
Main Magnetic Field Homogeneity (45 cm DSV)	<10 PPM
Maximum Field of View	45 cm (isotropic)
Minimum Field of View	10 mm
Minimum Slice Thickness	2 mm
Patient Bore Diameter	60 cm (Typical)
Bore Length	170 cm (Typical)
Gradient Magnetic Field (mT/m) in all XYZ Axis	33(Max)
Gradient Slew Rate (mT/m/ms)	120(Max)
Power Supply	~80 kVA



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Magnetic Resonance Imaging(MRI) Machine

**Superconducting
Magnet &
Gradient Coil**



**Control, Monitoring &
Interlock system**



Spectrometer



**IMRI
Reconstruction
Software**



RF Coils



Patient Table



RF Power Amplifier

SOCIETY FOR APPLIED MICROWAVE ELECTRONICS ENGINEERING AND RESEARCH

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