

CONSISTENTLY CLEAR. PERSONALIZED MR SIGNAL UNIFORMITY.

MultiDrive RF Transmit

New technologies bring new challenges.

The leap in image quality from 1.5T to 3.0T is unquestionable, yet as MR technology improves, new challenges continue to present themselves. For example, shading artifacts are more demanding at 3.0T than 1.5T, particularly with abdominal exams. As the 3.0T radio frequency (RF) energy penetrates the body, it is more or less effective in certain areas depending on the tissue it excites. This can create a variation in the MR signal and cause image shading.

Add a wider patient bore design to these 3.0T systems, and you can further complicate this issue since there is less space for the whole-body RF transmit coil. While larger bore designs greatly improve the patient experience, steps must be taken to precisely control the RF energy across the FOV to avoid increasing image shading artifacts.

“We needed a solution that balances 3.0T technology with our wide bore design to generate clear, uniform MR images for every patient type.”

– MR MultiDrive engineer

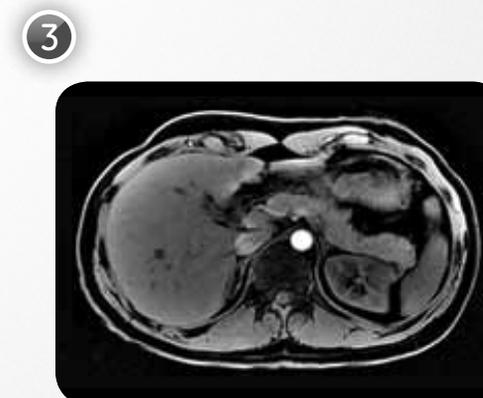
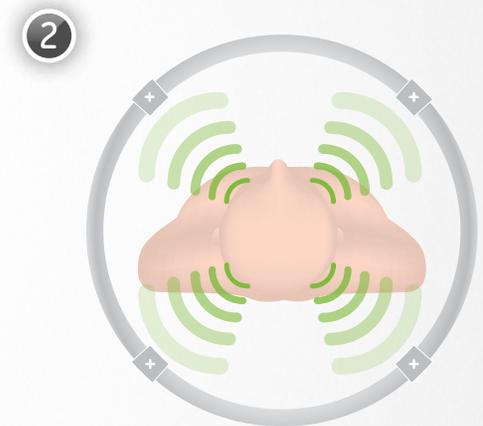


Introducing MultiDrive RF Transmit.

To meet this challenge, we've developed MultiDrive RF Transmit to tighten RF control and virtually eliminate 3.0T image shading in a wide bore system. MultiDrive uses the four-port drive, whole-body RF transmit coil design introduced with the Discovery* MR750w to help keep the RF uniform across the FOV.

Here's how it works. First, independent exciters are used to generate the RF pulse waveform shape, amplitude and phase. These RF pulses are sent to independent RF amplifiers before being applied to the four ports of the RF body coil. However, MultiDrive goes one step further. The phase and amplitude of each RF pulse is modified before being applied to the RF coil. This allows MultiDrive to automatically compensate and virtually eliminate RF-induced signal shading introduced by different body shapes and sizes. This levels out the RF signal through the anatomy so it's uniform across the patient.

- 1 MultiDrive ensures the RF and amplitude of each pulse are adapted for the anatomy of interest.
- 2 MultiDrive's RF modification produces uniform MR signal during reception.
- 3 MultiDrive automatically compensates and virtually eliminates B1-induced signal shading across different body shapes and sizes. The result is consistently clear and uniform images.



Use the presets or customize yourself. It's your choice.

MultiDrive has two modes of operation. The Preset mode utilizes predetermined RF amplitude and phase settings to generate the best possible image quality over a broad range of patients. These values have been determined based on a number of volunteers, calculating the ideal RF settings for each scan and then averaging the results. Optimized for the general population, this mode requires no additional pre-scan time and minimizes the required RF power and SAR needed to create uniform images.

The Per-Patient Optimization mode can be selected to customize the RF system for each individual patient. It executes a rapid calibration scan to create an RF map over the region of interest. This additional scan is 10 to 15 seconds long and can be performed in a single breath-hold. At the end of the scan, the system automatically calculates the optimal RF amplitude and phase values based on the RF map data. This mode is useful for challenging studies, such as extremely obese patients, or when ascites are present.

Only GE offers the flexibility to choose either Preset or Per-Patient modes with MultiDrive to generate consistently clear and uniform MR images you've come to expect.

“Just like the home theatre in your house, MultiDrive allows you the flexibility to use the presets or calibrate the settings yourself.”

- MR MultiDrive engineer



Preset mode
The Preset mode utilizes predetermined RF amplitude and phase settings to generate the best possible image quality over a broad range of patients.

Home theatre presets
MultiDrive's Preset mode is similar to most home theatre system presets for those who have standard room sizes.



Per-Patient Optimization mode
The Per-Patient Optimization mode is useful for challenging studies requiring customization, such as extremely obese patients, or when ascites are present.

Home theatre customization
The Per-Patient Optimization mode is similar to the same customization offered by speaker volume settings on most home theatre systems for those who have larger or smaller room sizes.

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This technology is compatible with the following systems:



Discovery MR750w

