



# **fidelity-research**

- **moving coil cartridges**
- **step-up transformers**
- **tonearms**



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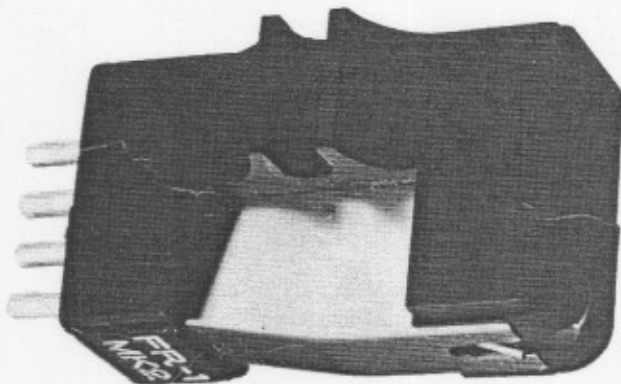


## Moving Coil Cartridges

At Fidelity-Research, cartridges have always held prime importance. The FR1-Mk2, FR1-Mk3F and the FR-7 are hand built moving coil cartridges which utilize the latest techniques to minimize distortion in the vibrating system. The cantilever, damper and stylus are all made of non-magnetic material. They also employ a specially designed and patented magnetic structure to intensify the forces of the magnetic fields around the coils. The FR1-Mk2 and FR1-Mk3F use an aluminum non-magnetic core to minimize distortion.

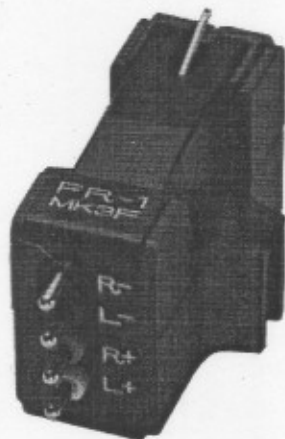
The FR1-Mk3F and MK-7 also use pure silver wire for their coils and leads. Their cantilevers are flattened to allow the stylus to be shortened and the effective tip mass lowered. A new stylus configuration called "line contact" has been developed for both the FR1-Mk3F and FR-7. This "line contact" configuration has the advantage of giving the stylus much greater surface contact with the record groove than conventional elliptical styli as well as maintaining the symmetry from the front to the back of the stylus. The "line contact" stylus has approximately five times more record contact than an elliptical stylus.

The FR-7 is a pure moving coil cartridge. It uses pure silver wire for the coil and has no iron at all in the core. Four poles and two magnets give the FR-7 ultra low impedance (3 ohm) with high output.



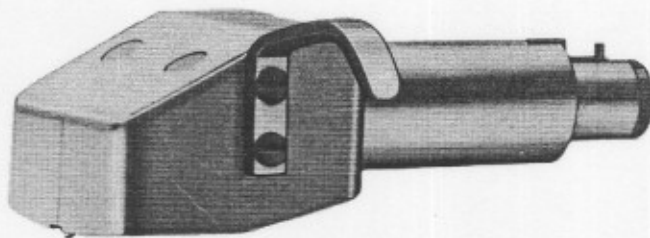
### FR1-Mk2

Frequency Response	20 Hz to 20 KHz
	+ 2 dB
Channel Balance	+ 1 dB
Crosstalk	27 dB or better
Compliance	$12 \times 10^{-8}$ cm/dyne
Coil impedance	30 ohms
Output Voltage	0.1 mV
Vertical Tracking Angle	15 degrees
Tracking Weight	15 - 20 gms (17 optimum)
Stylus	0.2 x 0.8 mil elliptical diamond



### FR1-Mk3F

Frequency Response	10 Hz - 40 kHz
Interchannel Balance	within 1dB or 1kHz
Stereo Separation	better than -26dB at 1kHz, and -22dB at 20 kHz
Compliance	$10 \times 10^{-8}$ cm/dyne
Output Voltage	0.14mV at 5cm/sec.
Load Impedance	10 ohm
Tracking Force	2 grams
Vertical Tracking Angle	15°
Stylus Tip	Line Contact Naked Diamond
Weight	10 grams



### FR-7

Frequency Response	10 Hz - 45 KHz
Interchannel Balance	within 1dB at 1KHz
Stereo Separation	Better than -28dB (200Hz-20KHz) -20dB (20Hz-200Hz)
Compliance	$6.5 \times 10^{-8}$ cm/dyne
Tracking Force	2.5 gms
Load Impedance	3 ohm
Output Voltage	0.3mV at 5cm/sec.
Stylus	Line Contact naked diamond
Weight (including headshell)	30 gms (Patent pending)



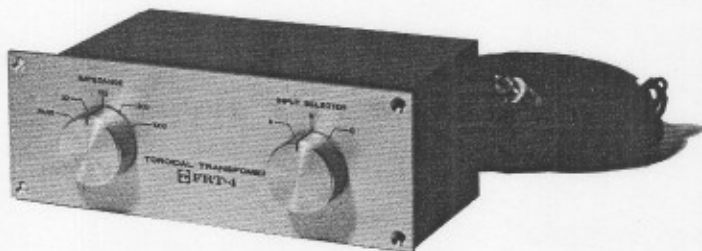
# Step-Up Transformers

All Fidelity Research Step-Up Transformers use toroidal transformers. This minimizes leakage of Magnet Flux and also makes the transformers less susceptible to magnetization from outside sources such as phono motors and main transformers.

The coil windings are made of a unique permalloy with very uniform magnetic domain characteristics to minimize the Barkhausen effect. They are all very linear at low input levels and have a very high saturation point to give you the full dynamic range of moving coil cartridges.

### FRT-3

Type of Core .....	Toroidal
Primary Impedance .....	30/10 ohms
Secondary Impedance .....	12K ohms
Load Impedance .....	50K ohms (47K - 50K ohms)
Boosting Ratio .....	26 dB - 31 dB
Frequency Range .....	20 Hz to 30 KHz
Distortion .....	Negligible up to 2V RMS Output

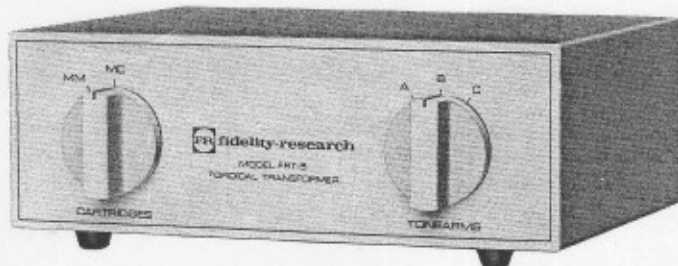


### FRT-4

Type of Core .....	Toroidal Core
Primary Impedance .....	3 ohms/10ohms/30ohms and 100 ohms
Load Impedance .....	50K ohms (47K-50K ohms)
Boosting Ratio .....	31.1 dB, 3 ohms 26.3 dB 10 ohms 25.2 dB, 30 ohms 20.0 dB, 100 ohms
Frequency Range .....	20 Hz - 30 KHz
Distortion .....	Negligible up to 2V RMS Output

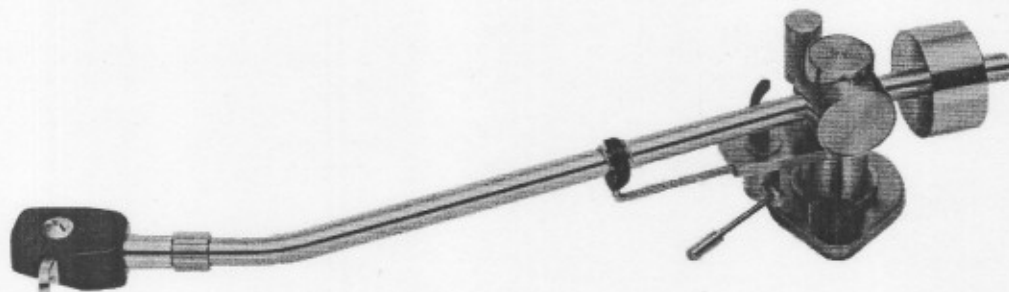
### FRT-5

Type of Core .....	Toroidal
Input Impedance .....	3 - 10 ohms
Load Impedance .....	50 K ohms
Boosting Ratio .....	3 ohms, 31 dB 10 ohms, 29 dB
Frequency Response .....	15 Hz - 50 KHz





# Tone Arms

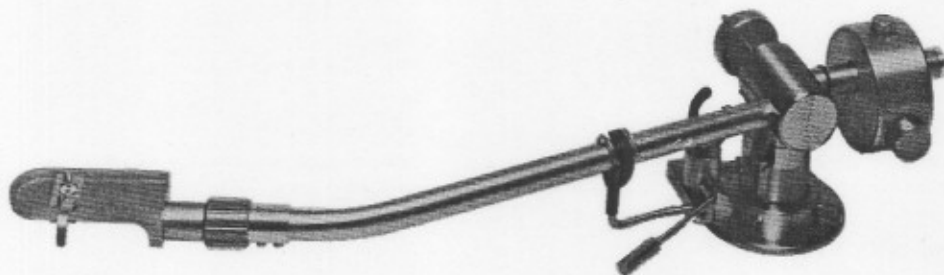


### FR-64s

Overall Arm Length . . . . . 322mm (Approx. 12.677")  
 Pivot/Stylus Distance . . . . . 245mm (Approx. 9.646")  
 Suitable Turntable Height . . . . . 24-60mm (Approx. 0.945-2.363")  
 Maximum Arm Board Thickness . . . . . 35mm (Approx. 1.378")  
 Arm Mounting Hold Diameter . . . . . 31mm (Approx. 1.220")  
 Stylus Overhand . . . . . 15mm (Approx. 0.590")  
 Anti-Skate Device, Weight & Lever . . . . . 0.5w/1gm Calibration  
 Vertical Tracking Force Range . . . . . 0-5gms with 0.5gm Calibration  
 Suitable Cartridge Weight . . . . . 0.24gms with FRS/3 Headshell  
 Tonearm Cable Capacitance . . . . . 80pF  
 Maximum Tracking Error . . . . . +1 Deg 40' & -1 Deg. 20'  
 Nulls 63 & 120mm  
 Resonant Frequency . . . . . 7 Hz w/FR-1Mk3 & FR-1Mk3F  
 Effective Mass . . . . . 30 gms W FR S/3 Headshell  
 Bearing Radial Ball in Carriers . . . . . Friction, less than 5mg

### FR-66s

Overall Arm Length . . . . . 382mm (Approx. 5.059")  
 Pivot/Stylus Distance . . . . . 307mm (Approx. 12.087")  
 Suitable Turntable Height . . . . . 29.5-60mm (Approx. 1.161/2.362")  
 Max. Arm Board Thickness . . . . . 35mm (Approx. 1.378")  
 Arm Pillar Post Hole Diameter . . . . . 41mm (Approx. 1.614")  
 Stylus Overhang . . . . . 12mm (Approx. 0.472")  
 Anti-skate Device . . . . . Weight & Lever (0.5w/10 gm Steps)  
 Tracking Force Range (Gm) . . . . . 0.5 gm(w/0.5gm Calibration)  
 Suitable Cartridge Weight . . . . . 0-18.7gms (W/FR-S/3 Headshell)  
 Patch Cable Capacitance . . . . . 80 pF  
 Max Tracking Error . . . . . + 1 Deg. 40' & -0.36'  
 Vertical Bearing Type . . . . . Radial Ball  
 Lateral Bearing Type . . . . . Radial Ball  
 Resonant Frequency . . . . . 67 Hz(w/FR-1Mk2 or Mk3 Cartridge)  
 Effective Mass . . . . . 38 gms  
 Bearing Friction . . . . . Less than 5mg



### FR-12

Overall Arm Length . . . . . 291.4mm (Approx. 11.472")  
 Pivot/Stylus Distance . . . . . 230mm (Approx. 9.055")  
 Suitable Turntable Height . . . . . 27-55mm (Approx. 1.063-2.165")  
 Max Arm Board Thickness . . . . . 35mm (Approx. 1.378")  
 Pillar Post Hole Diameter . . . . . 28mm (Approx. 1.102")  
 Stylus Overhang . . . . . 17mm (Approx. 0.669")  
 Anti-Skate Device . . . . . Wt & Lever (0.25 gm Calibration)  
 Tracking Force Range . . . . . 0 gm - 3 gm (0.5 Calibration)  
 Suitable Cartridge Weight . . . . . 4 Gm - 12 Gm (with FR-S/6 Headshell)  
 Maximum Tracking Error . . . . . +1 Deg. 58' & -1 Deg. 13'  
 Nulls 63-120mm  
 Horizontal & Vertical Bearings . . . . . Radial Ball  
 Vertical Bearing Friction . . . . . Less than 0.005 gms  
 Tonearm Cable Capacitance . . . . . 80pF  
 Headshell FR S/6 . . . . . Machine arm solid black aluminum

### FR-14

Overall Arm Length . . . . . 31 mm (12.24")  
 Pivot/Stylus Distance . . . . . 245 mm  
 Suitable Turntable Height . . . . . 27 mm - 55 mm  
 Max Arm Board Thickness . . . . . 35 mm  
 Arm Base Hole Diameter . . . . . 28 mm  
 Stylus Overhang . . . . . 15 mm  
 Tracking Force Range . . . . . 0.3 gms (0.25gms Calibration)  
 Suitable Cartridge Weight . . . . . 1 - 12 gms  
 Max Tracking Error . . . . . +1°20' (0° at 58mm & 120mm from center spindle)  
 Anti-Skate Device . . . . . Weight & Lever (0.5gms Calibration)  
 Horizontal & Vertical Bearing . . . . . Radial Ball  
 Vertical Arm Friction . . . . . Less than 0.005 gms  
 Patch Cord Capacitance . . . . . 80 pF  
 Arm Resonance Frequency . . . . . 8.1 Hz (w/FK-1MK3F)  
 Effective Mass . . . . . 14 gms  
 Head Shell . . . . . Machined from solid block aluminum (Model FR-S/6)

## 60 SERIES

Both the 64S and the 66 tonearms are machined from non-magnetic stainless steel for maximum rigidity. Stylus force is controlled by a linear dynamic balance spring contained in the stylus force adjusting control on the pillar post. Because the spring is linear, settings between the 0.5 Gm markers are not only possible but very accurate. A collet chuck socket nut assures a rigid connection between the headshell and the tone-arm, providing interchangeability of Universal headshells with maximum ease and guaranteed positive alignment. A concealed suspension mechanism in both vertical and horizontal axes assures "dust free" bearings for the life of the tone-arm. For the first time it is possible to balance the tone-arm, completely independent of the anti-skating device. It operates only after the stylus has been placed into the lead-in record grooves.

A valuable accessory available for both tone-arms is the B60 stabilizer and elevation device.

The B60 has a knurled adjustment knob whose function is to precisely adjust the stylus tracking angle once a rough setting has been obtained and the pillar post set screws tightened. For those with the requisite equipment, test records or simply a good ear, it is now possible to secure a precise vertical stylus tracking angle even as the record is being played.

## 10 SERIES

Both the FR 12 and 14 were designed specifically for such turntables as the Linn Sondek and the ERA which require the shorter arm. Both are static balanced arms. A height adjustment reference scale permits repeatable adjustments to the vertical tracking angle to match record cutting angle. The tubular arm pipe is offset from the pillar post. The result is shorter length with less bend between the pillar post and the headshell. Thus, higher rigidity and lower mass.

Both the FR 12 and the FR 14 use an antiskate device which is not activated until the arm reaches the record edge. The FR 12 and FR 14 also have the advantage of variable placement with regard to the centre spindle. This is accomplished by making the antiskate device laterally adjustable on the pillar post. In use this means that one can have the arm rest in a position most suitable to the turntable it is on. All FR tone-arms have lateral counterbalances so that the arm can be balanced if the table is not level.