Prototyping Custom UI in SwiftUI

Tobias
Due
Munk

dotSwift

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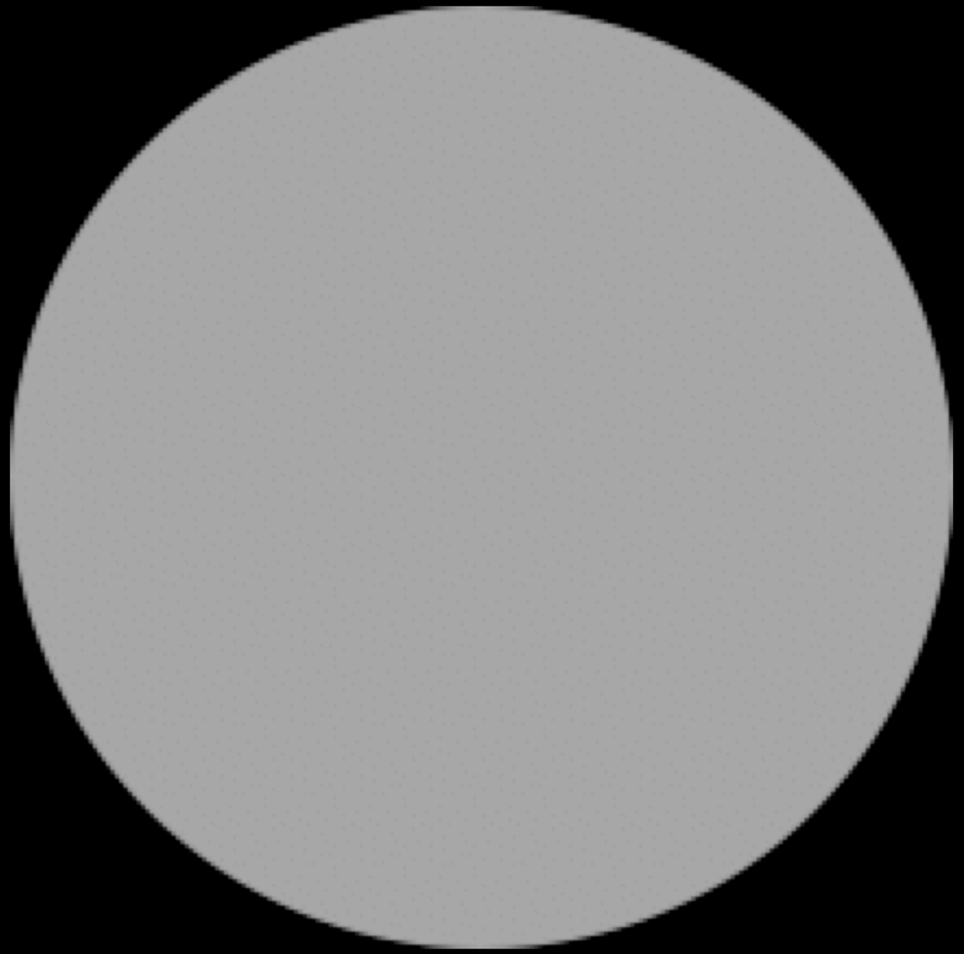
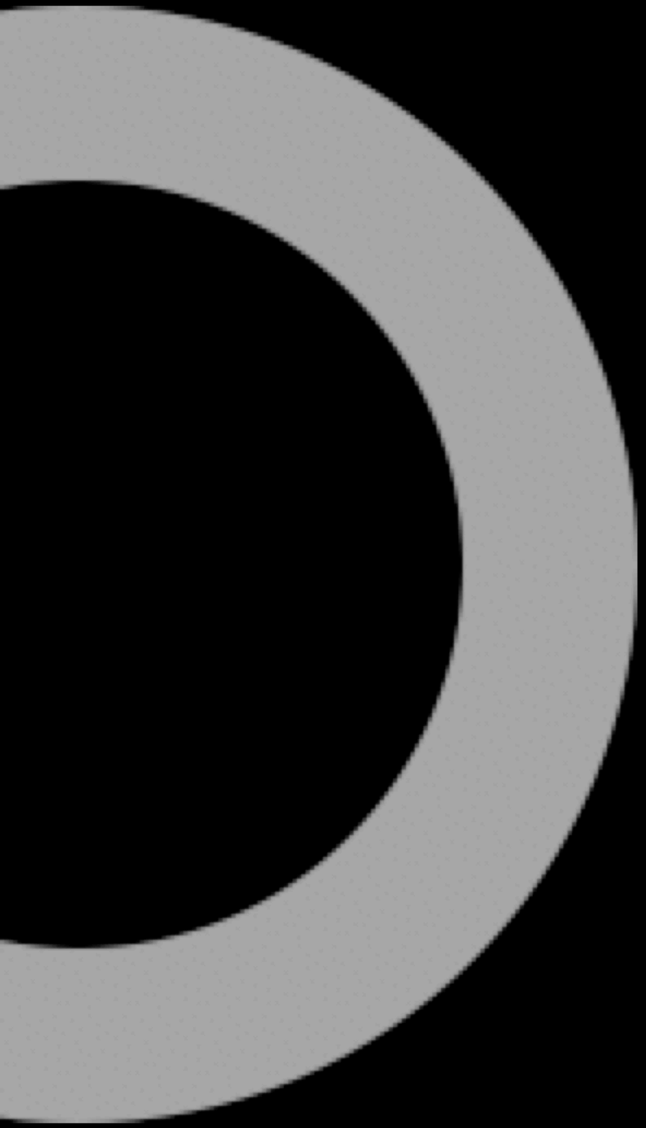
2020

Visualize Sound Level

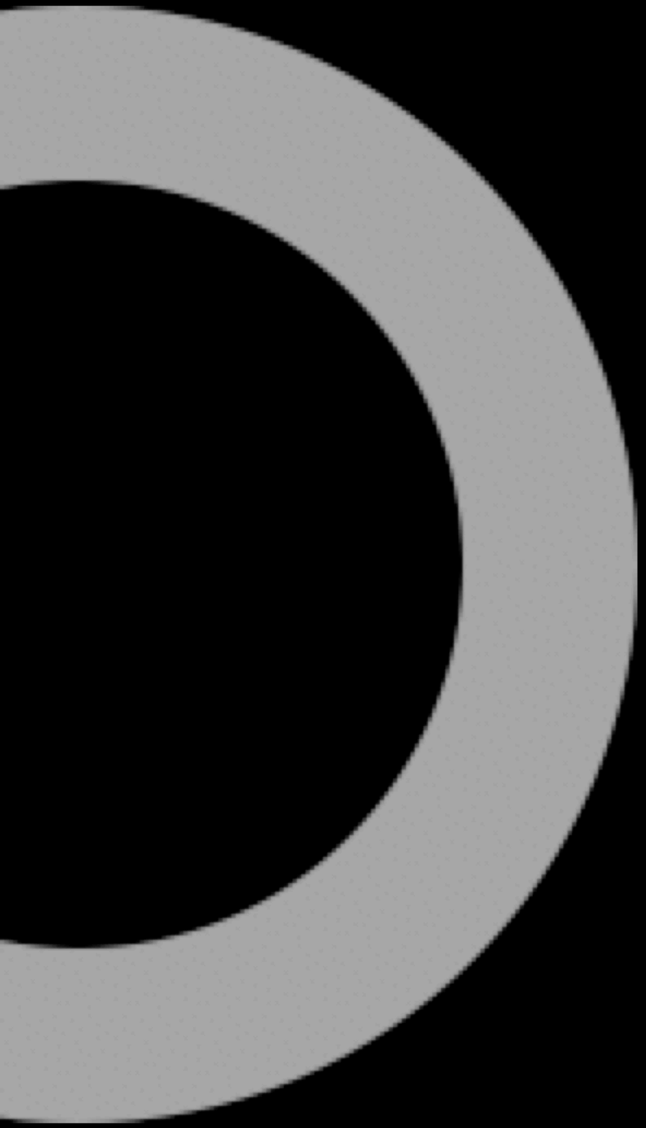
```
struct Gauge: View {
    var body: some View {

    }
}
```



```
struct Gauge: View {
    var body: some View {
        Circle()
    }
}
```

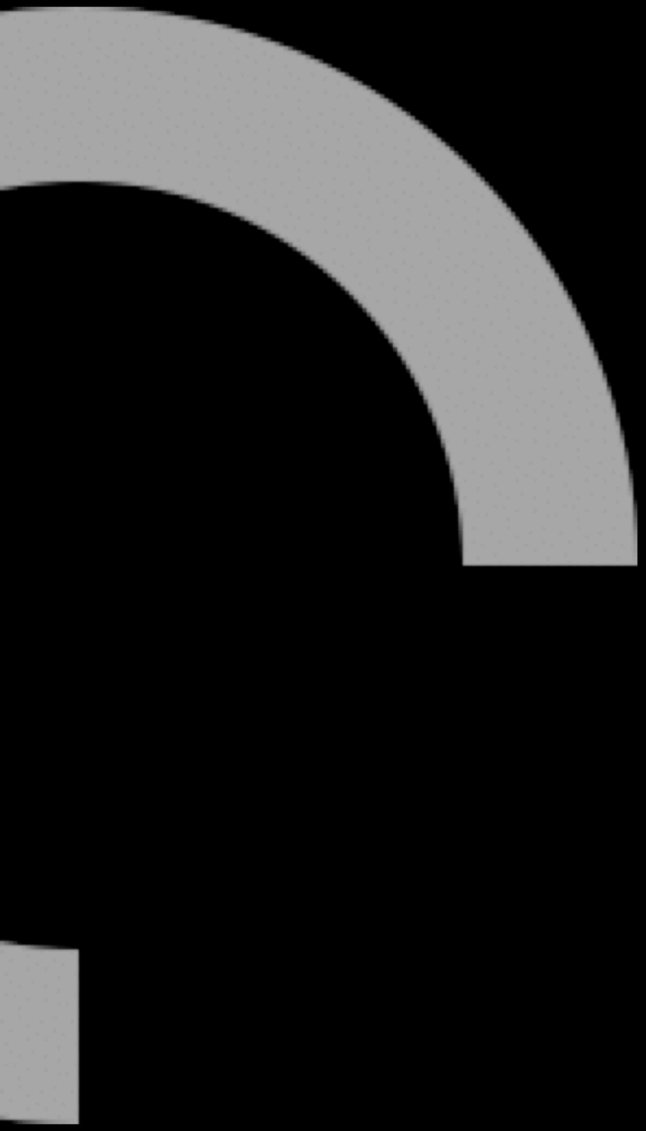


```
struct Gauge: View {
    var body: some View {
        Circle()
            .stroke(style:
                StrokeStyle(lineWidth: 40)
            )
    }
}
```



```
struct Gauge: View {
    let thickness: CGFloat = 40

    var body: some View {
        Circle()
            .stroke(style:
                StrokeStyle(lineWidth: thickness)
            )
    }
}
```

```
struct Gauge: View {
    let thickness: CGFloat = 40
    let trim: ClosedRange<CGFloat> = 0...0.65

    var body: some View {
        Circle()
            .trim(from: trim.lowerBound,
                  end: trim.upperBound)
            .stroke(style: ...)
    }
}
```



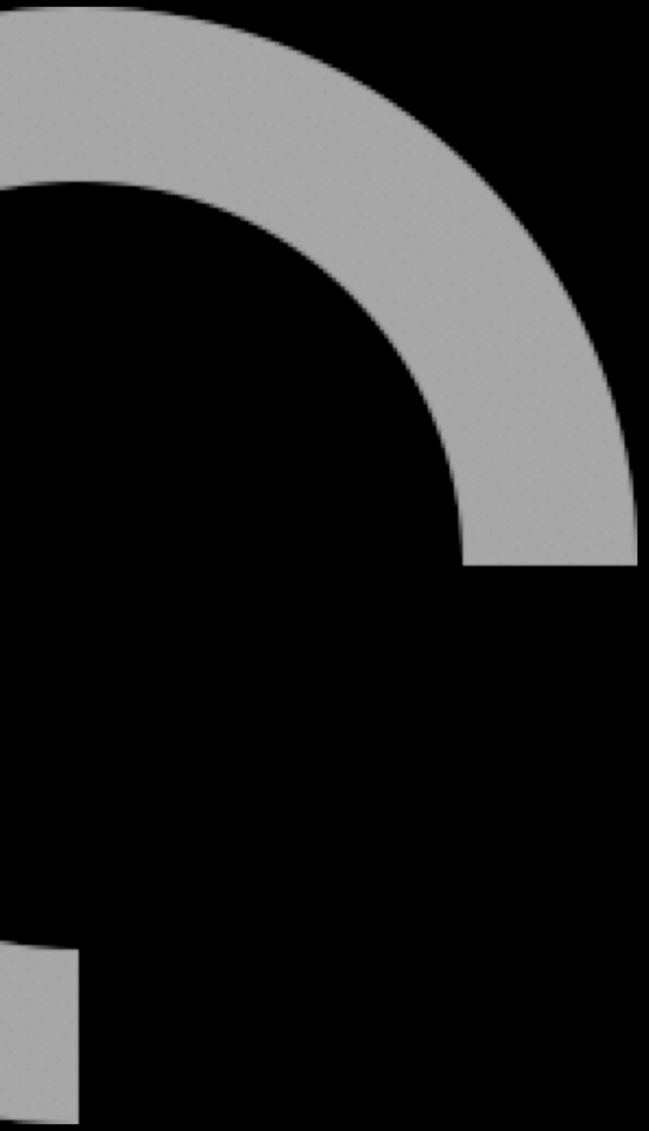
```
struct Gauge: View {
    var thickness: CGFloat = 40
    var trim: ClosedRange<CGFloat> = 0...1

    var body: some View {
        Circle()
            .trim(from: trim.lowerBound,
                  end: trim.upperBound)
            .stroke(style: ...)
    }
}

Gauge()
Gauge(thickness: 30, trim: 0...0.75)
Gauge(trim: 0...0.75)
```

Gauge()

```
AngularGradient(gradient: ...,
                center: .center)
    .mask(Gauge())
```

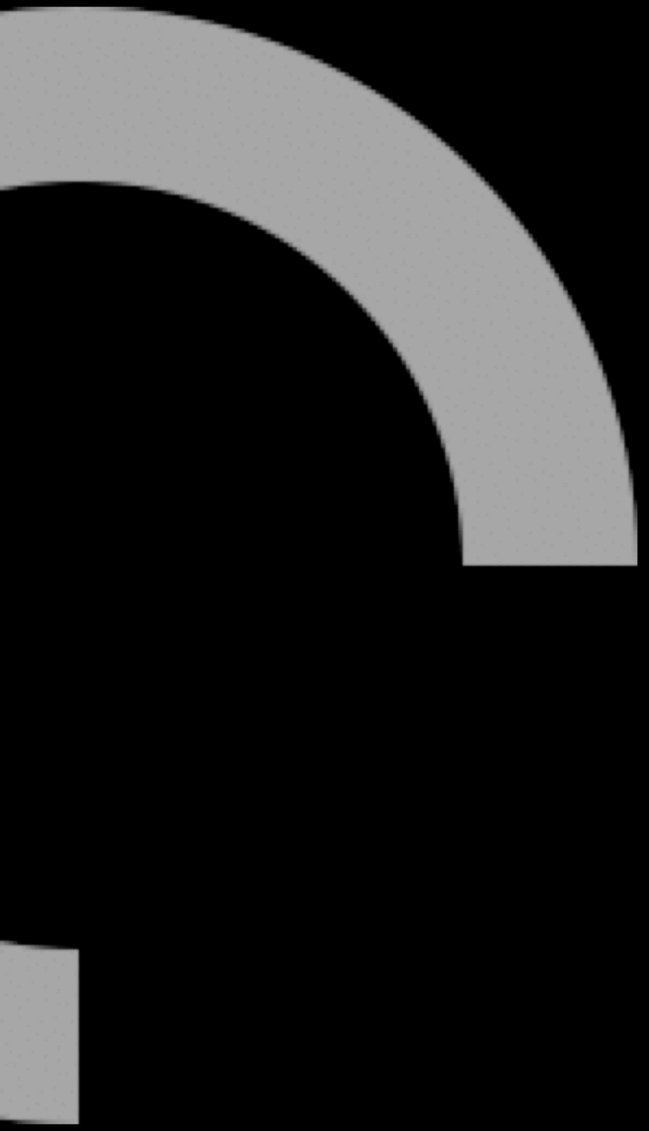
```
Gauge()
    .maskContent(using:
        AngularGradient(gradient: ...,
                        center: .center)
    )
```

```
Gauge()
    .maskContent(using:
        AngularGradient(gradient: ...,
                        center: .center)
    )

extension View {
    func maskContent<T: View>(using: T) -> some View {
        using.mask(self)
    }
}
```



```swift
Gauge()
//   .maskContent(using:
//       AngularGradient(gradient: ...,
//                       center: .center)
//   )

extension View {
    func maskContent<T: View>(using: T) -> some View {
        using.mask(self)
    }
}
```

```
var colorize: Bool = false

Gauge()
    .if(colorize) {
        $0.maskContent(...)
    }
```



```swift
extension View {

    func `if`<T: View>(_ conditional: Bool,
                       transform: (Self) -> T) -> some View {
        Group {
            if conditional {
                transform(self)
            } else {
                self
            }
        }
    }
}
```

```
var colorize: Bool = true

Gauge()
    .if(colorize) {
        $0.maskContent(...)
    }
```

```
var thickness: CGFloat

Gauge(thickness: thickness)
```

```
@State var thickness: CGFloat

Gauge(thickness: thickness)

Slider($thickness, in: 10...60) {
    Text("Thickness: \(thickness)")
}
```

Thickness: 40

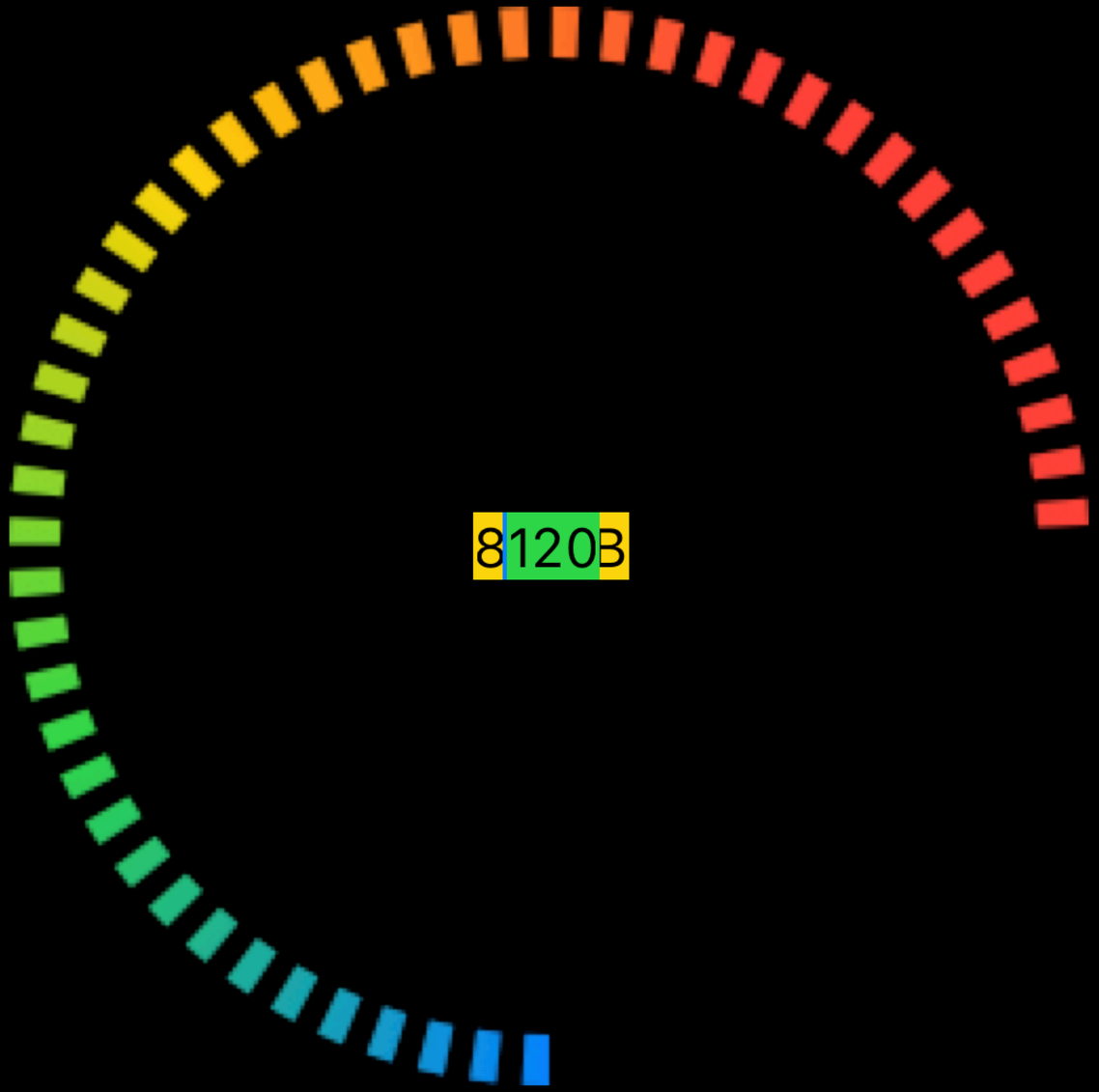
```
@State var thickness: CGFloat = 40
@State var gap: CGFloat = 0

Gauge(thickness: thickness, dashGap: gap)

Slider($thickness, in: 10...60) {
    Text("Thickness: \(thickness)")
}
Slider($gap, in: 0...20) {
    Text("Dash Gap: \(gap)")
}
```

Thickness: 40

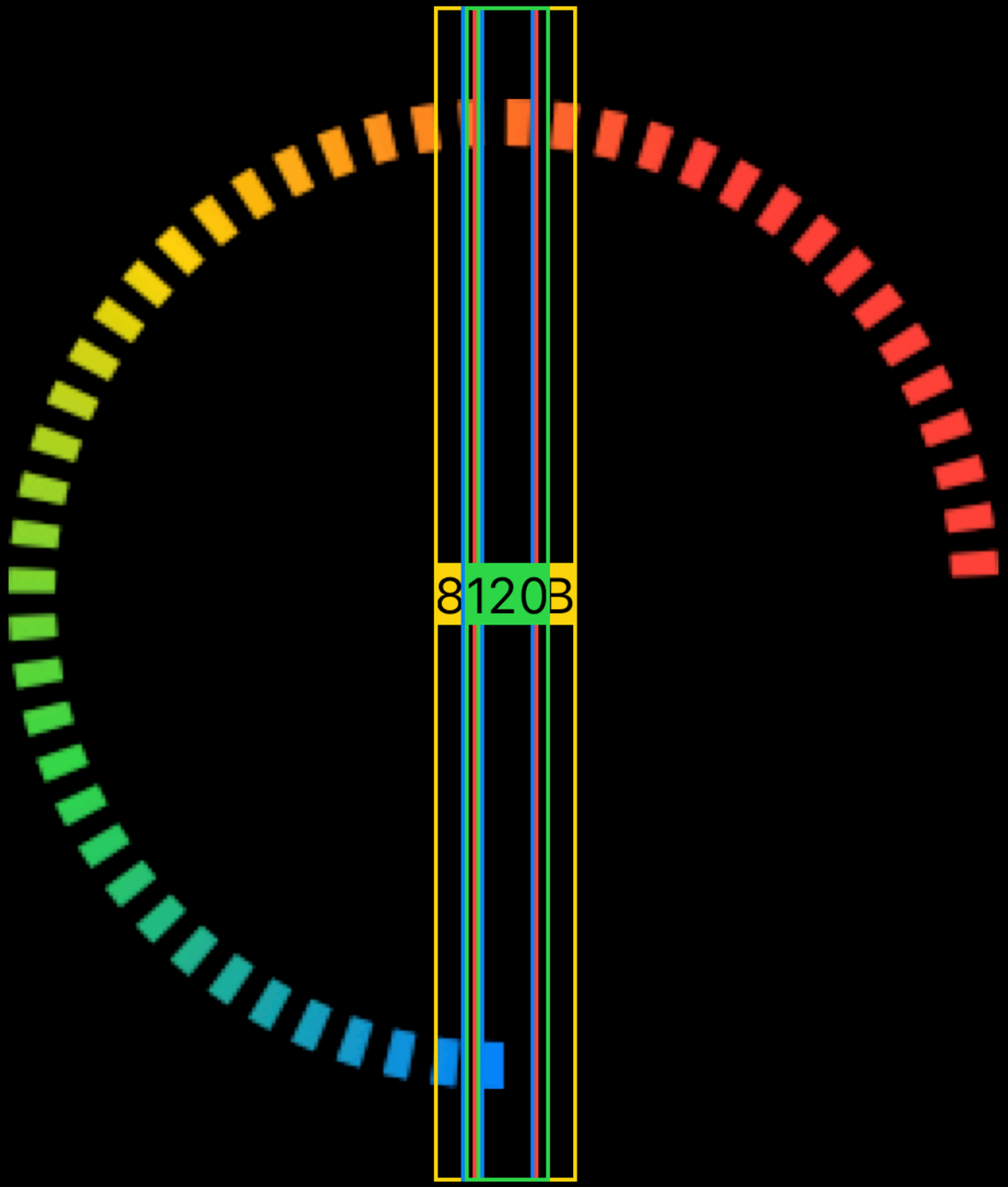
Dash Gap: 0

ZStack {}

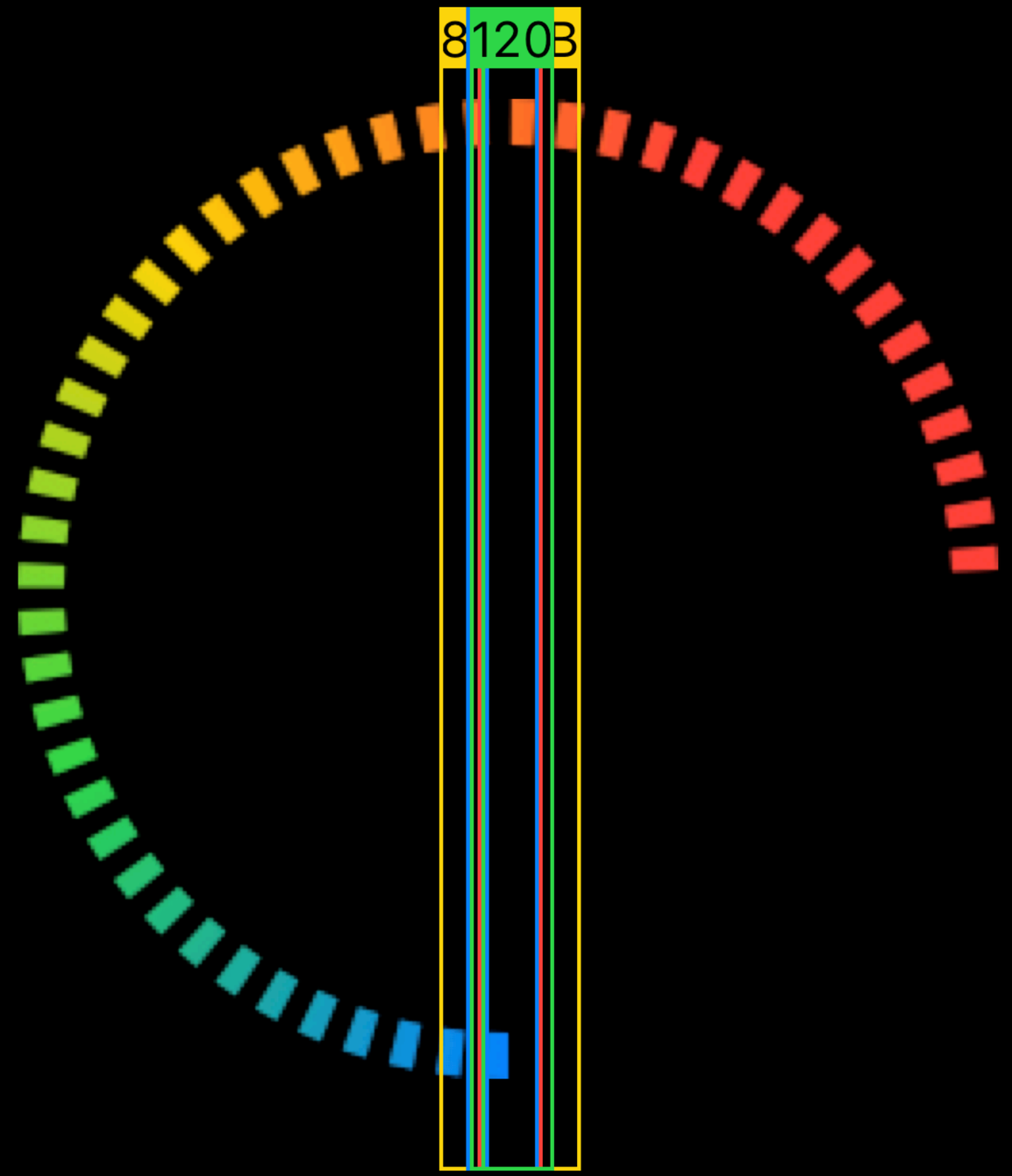

```
ZStack {
    ForEach(0...9, id: \.self) { i in
        Text(decibels(at: i))
    }
}
```



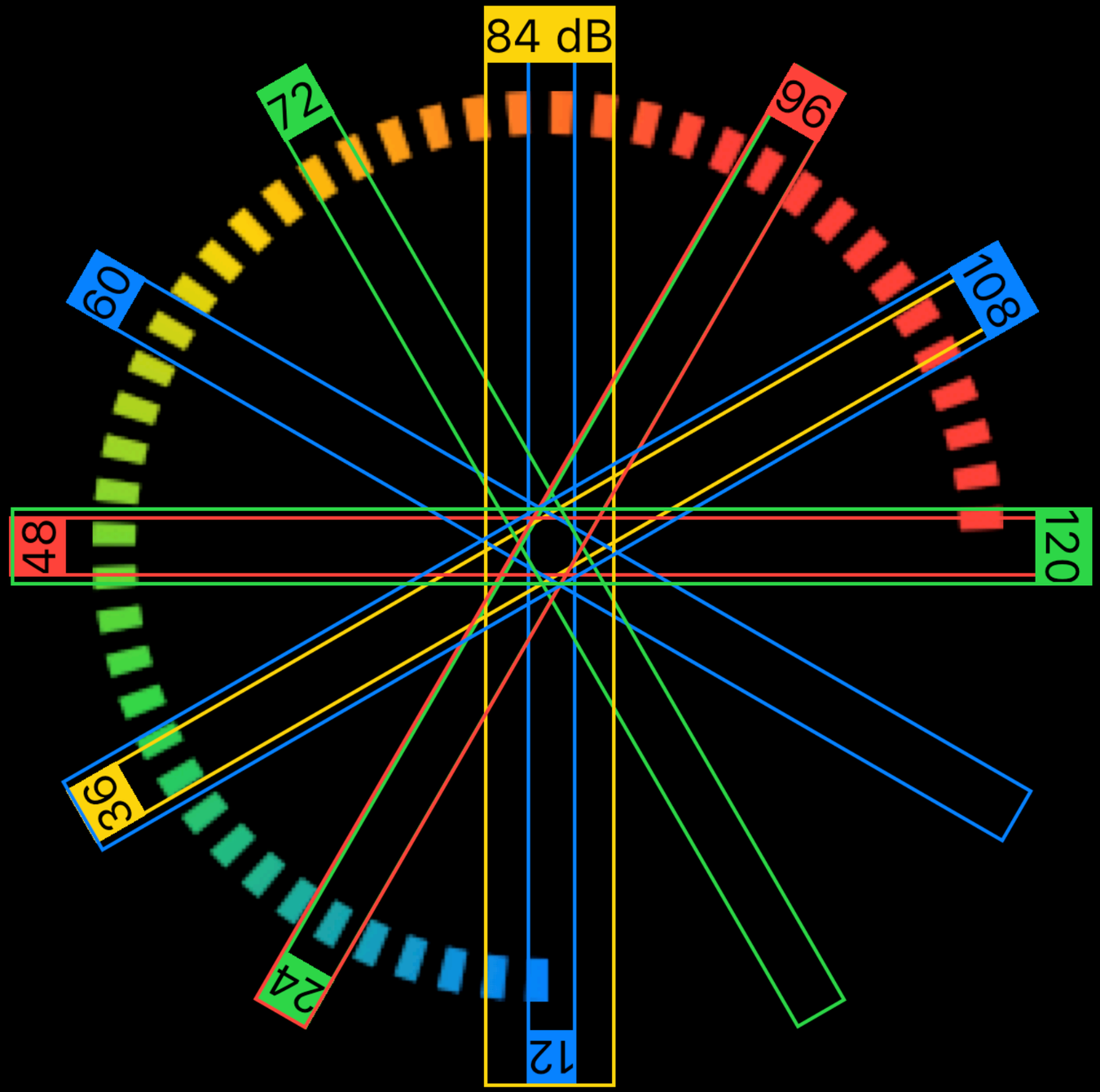

```
Text(decibels(at: i))
    .background(/* Color */)
```



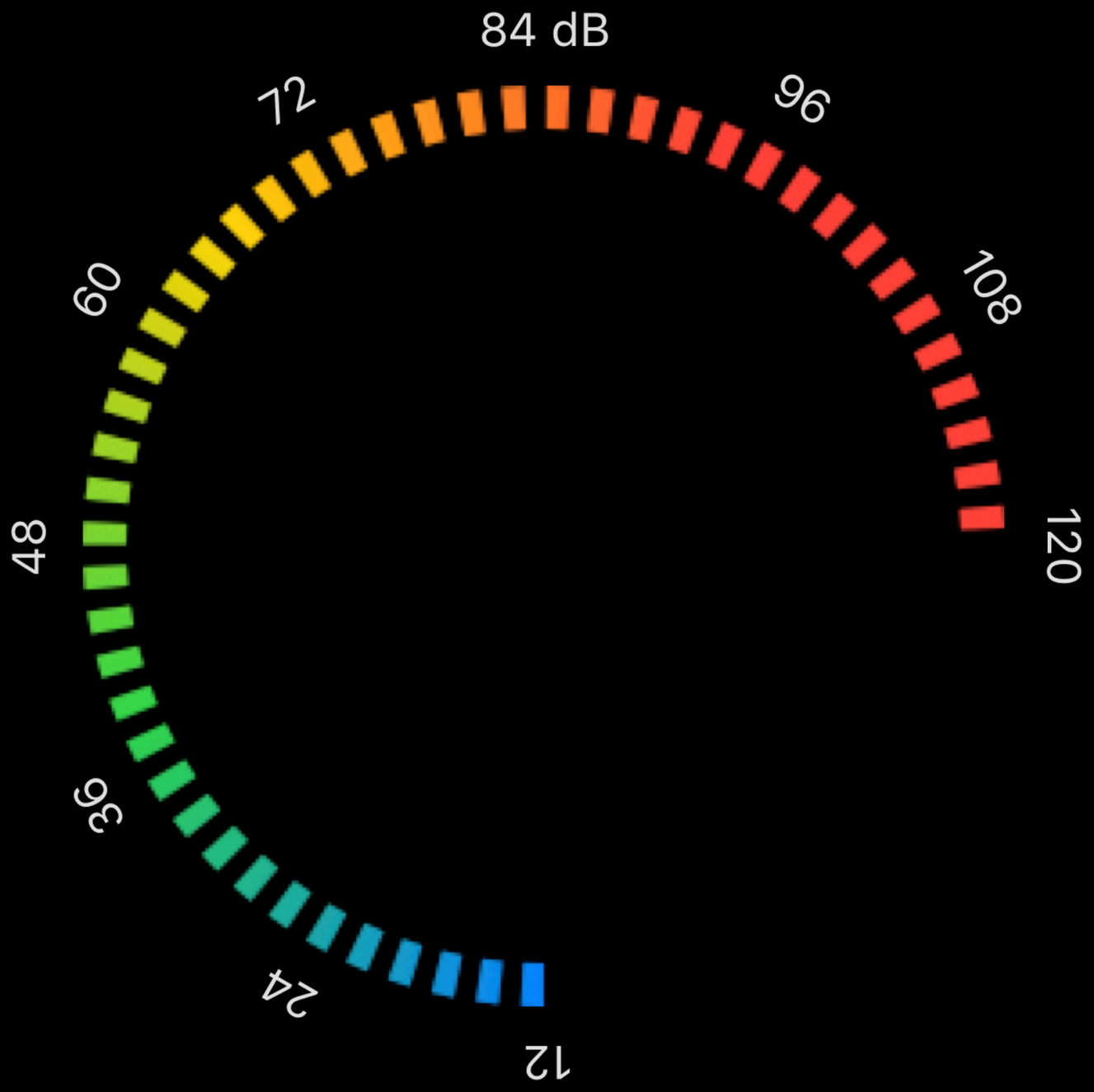

```
Text(decibels(at: i))
    .background(/* Color */)
    .frame(maxHeight: .infinity)
    .border(/* Color */)
```



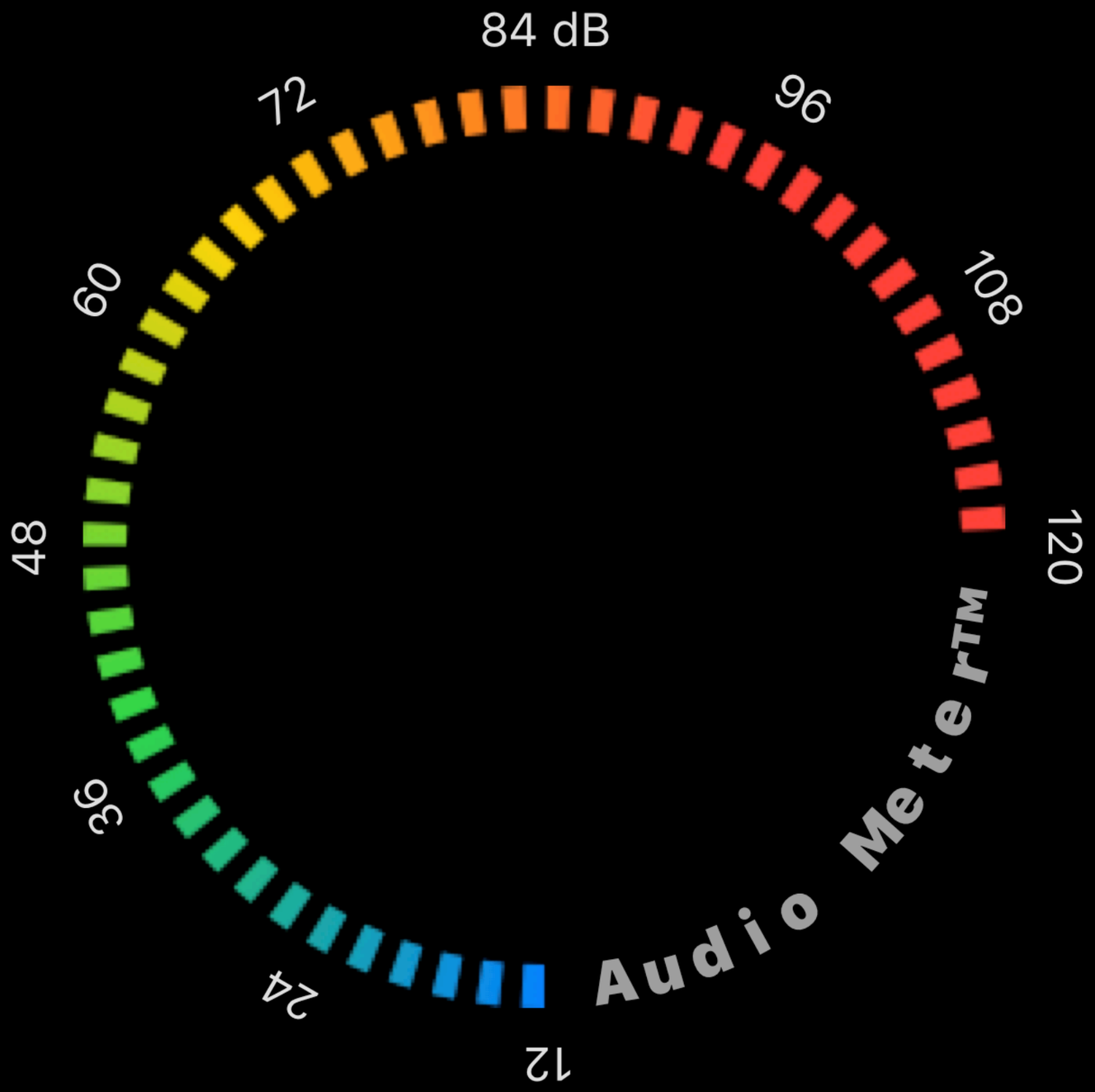

```
Text(decibels(at: i))
    .background(/* Color */)
    .frame(maxHeight: .infinity,
           alignment: .top)
    .border(/* Color */)
```




```
Text(decibels(at: i))
    .background(/* Color */)
    .frame(maxHeight: .infinity,
           alignment: .top)
    .border(/* Color */)
    .rotationEffect(.degrees(i * 30))
```

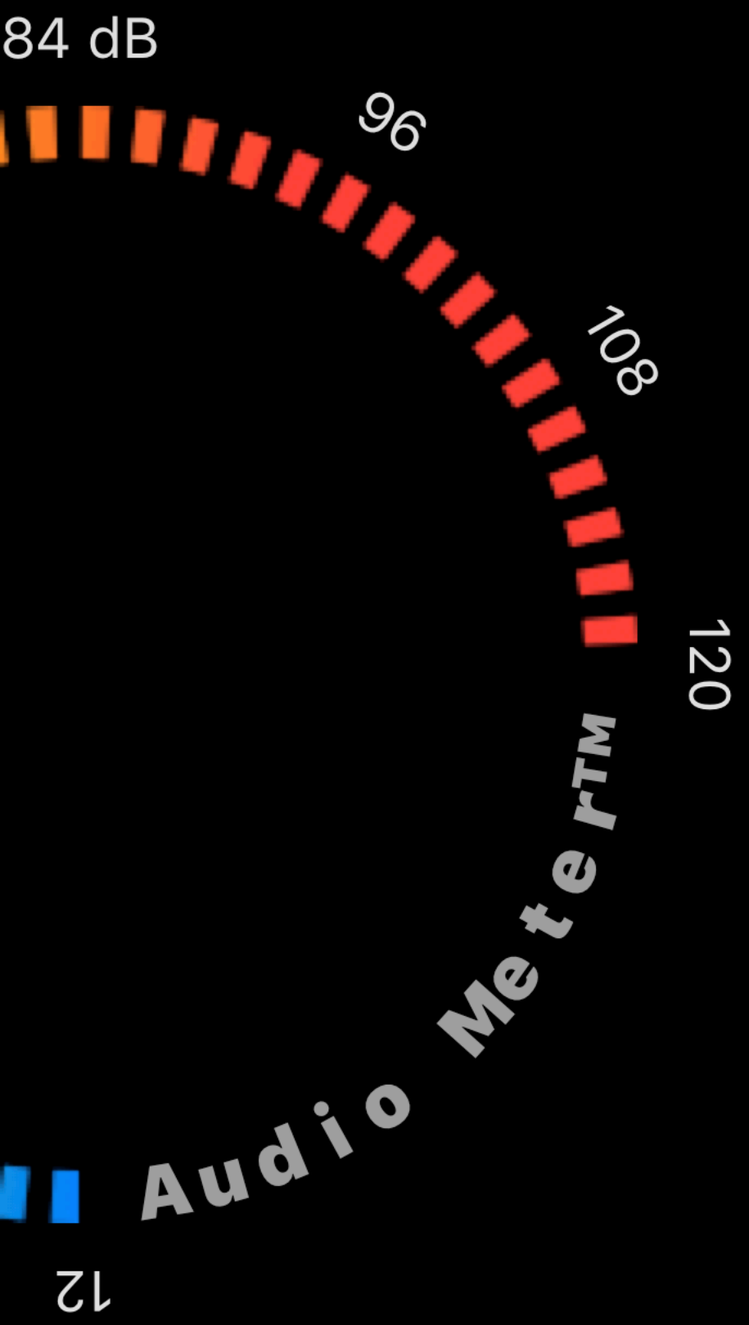



```
Text(decibels(at: i))
    .frame(maxHeight: .infinity,
           alignment: .top)
    .rotationEffect(.degrees(i * 30))
```

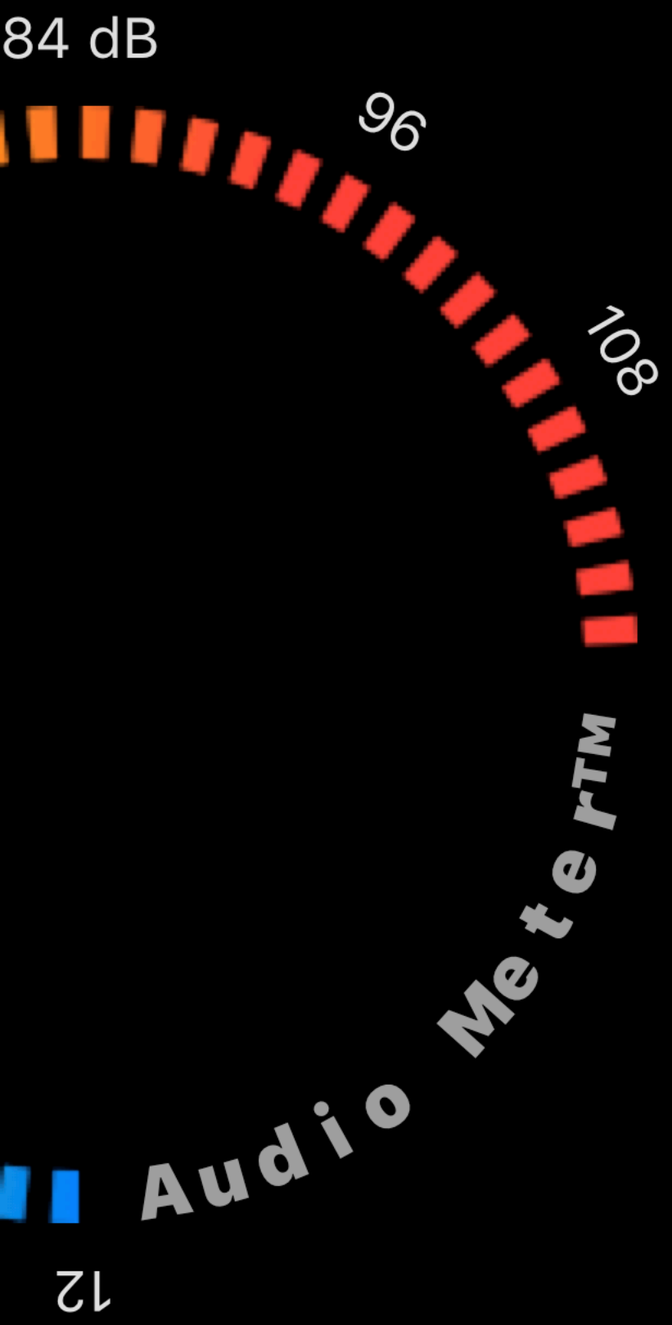



```
Text(character)
    .frame(maxHeight: ...,
           alignment: .bottom)
    .rotationEffect(/* Angle */)
```

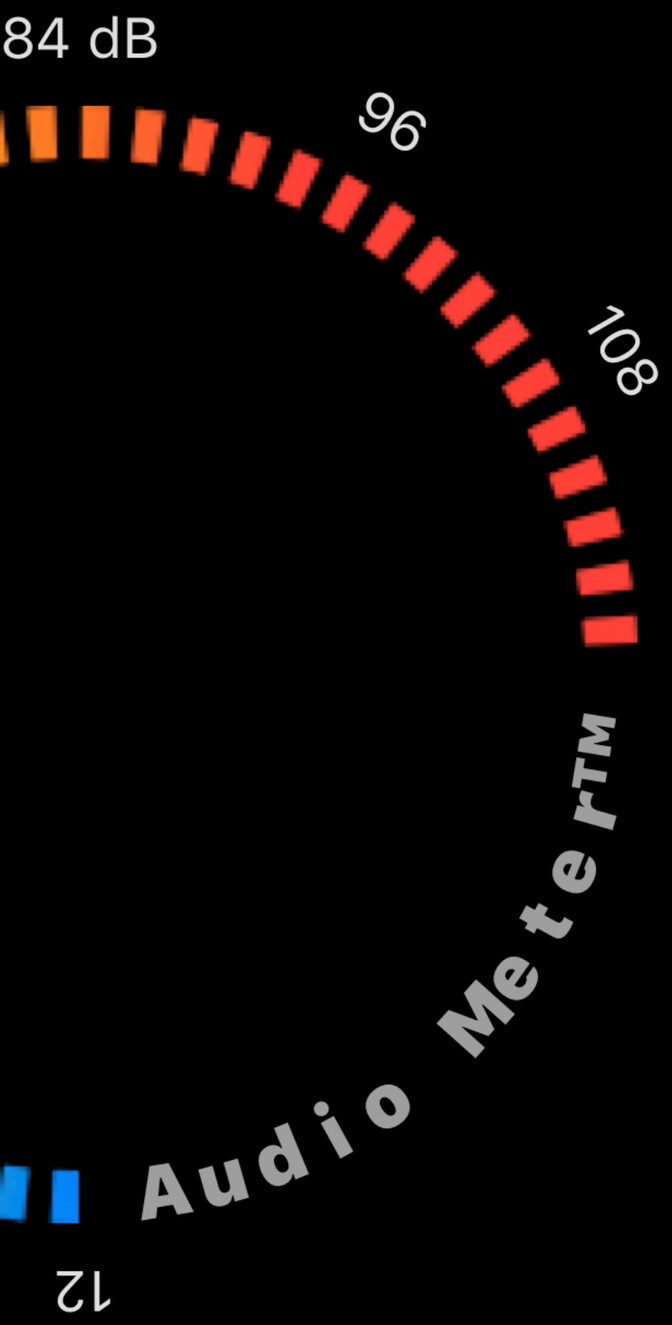
```
Text(character)
    .background(

    )
```



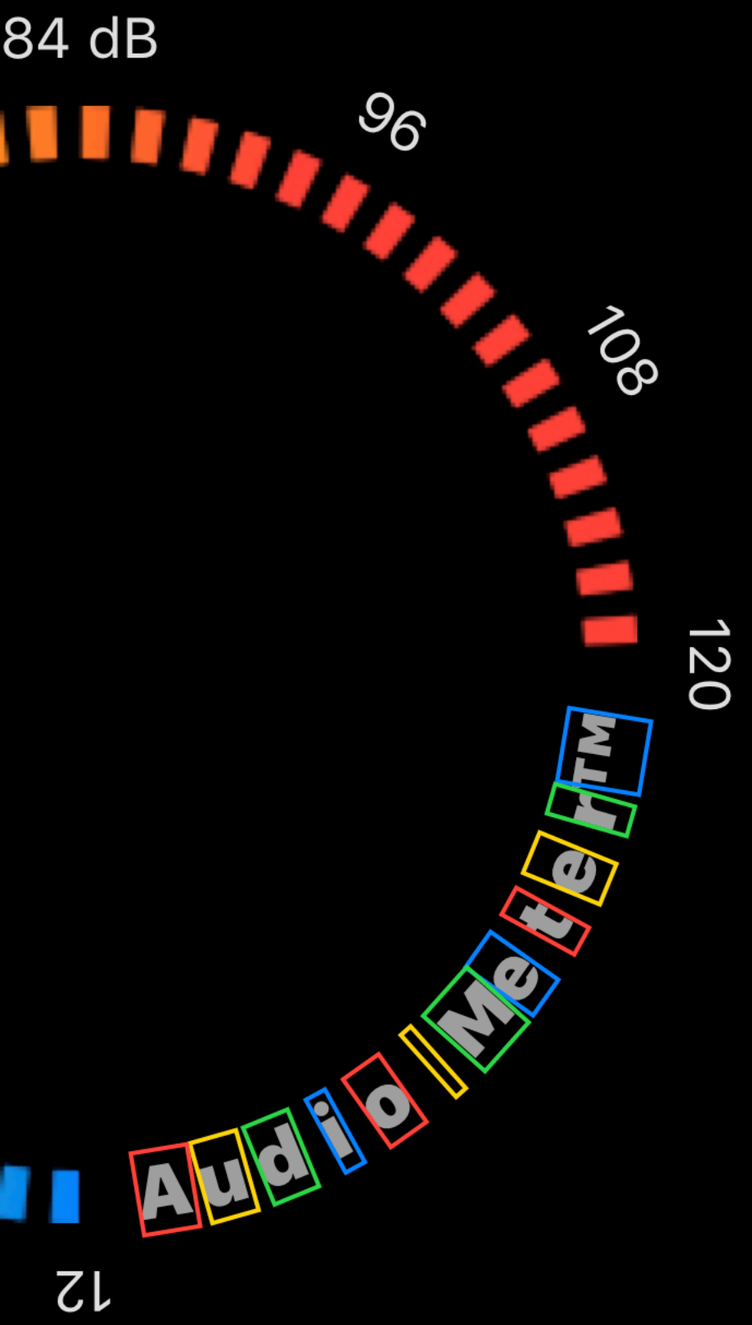

```
Text(character)
    .background(
        GeometryReader { proxy in
            /* proxy.size */
        }
    )
```



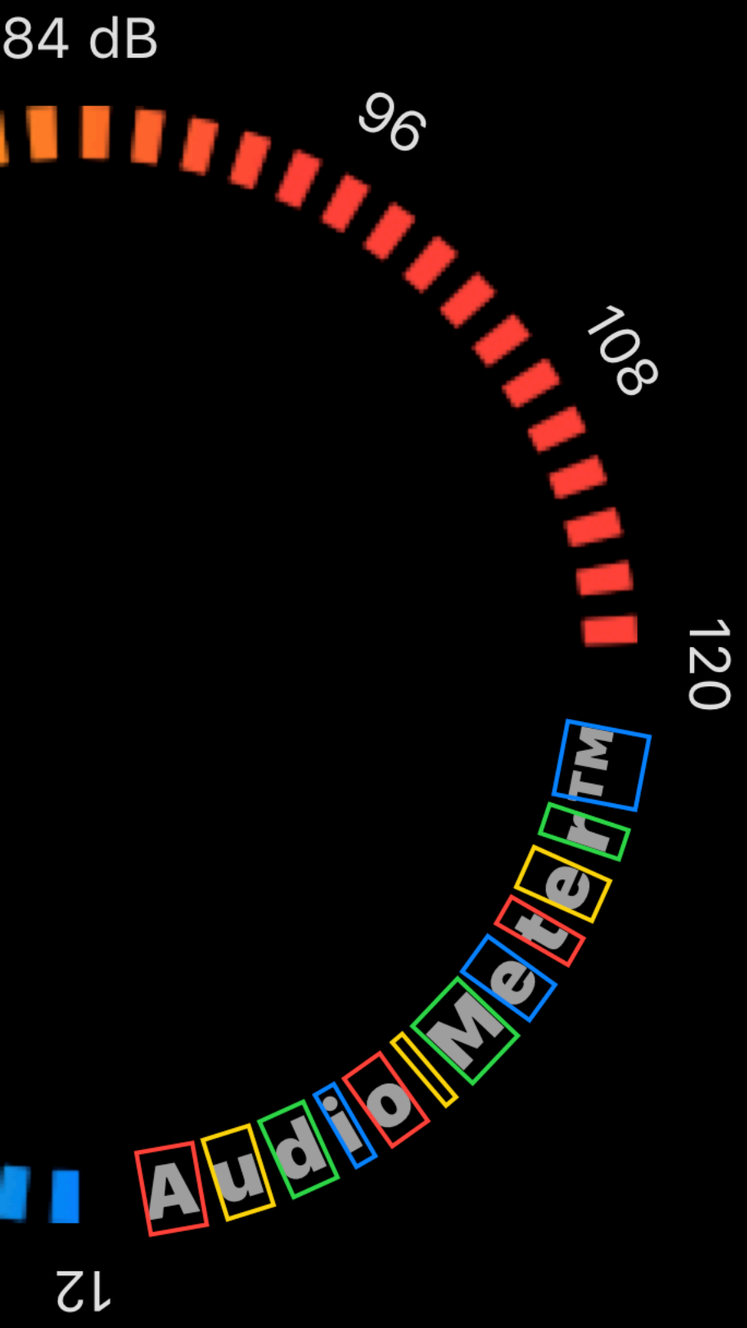

```
private struct SizeKey: PreferenceKey {
    static var defaultValue: [CGSize] { [] }

    static func reduce(value: inout [CGSize],
                       nextValue: () -> [CGSize]) {
        value.append(contentsOf: nextValue())
    }
}
```



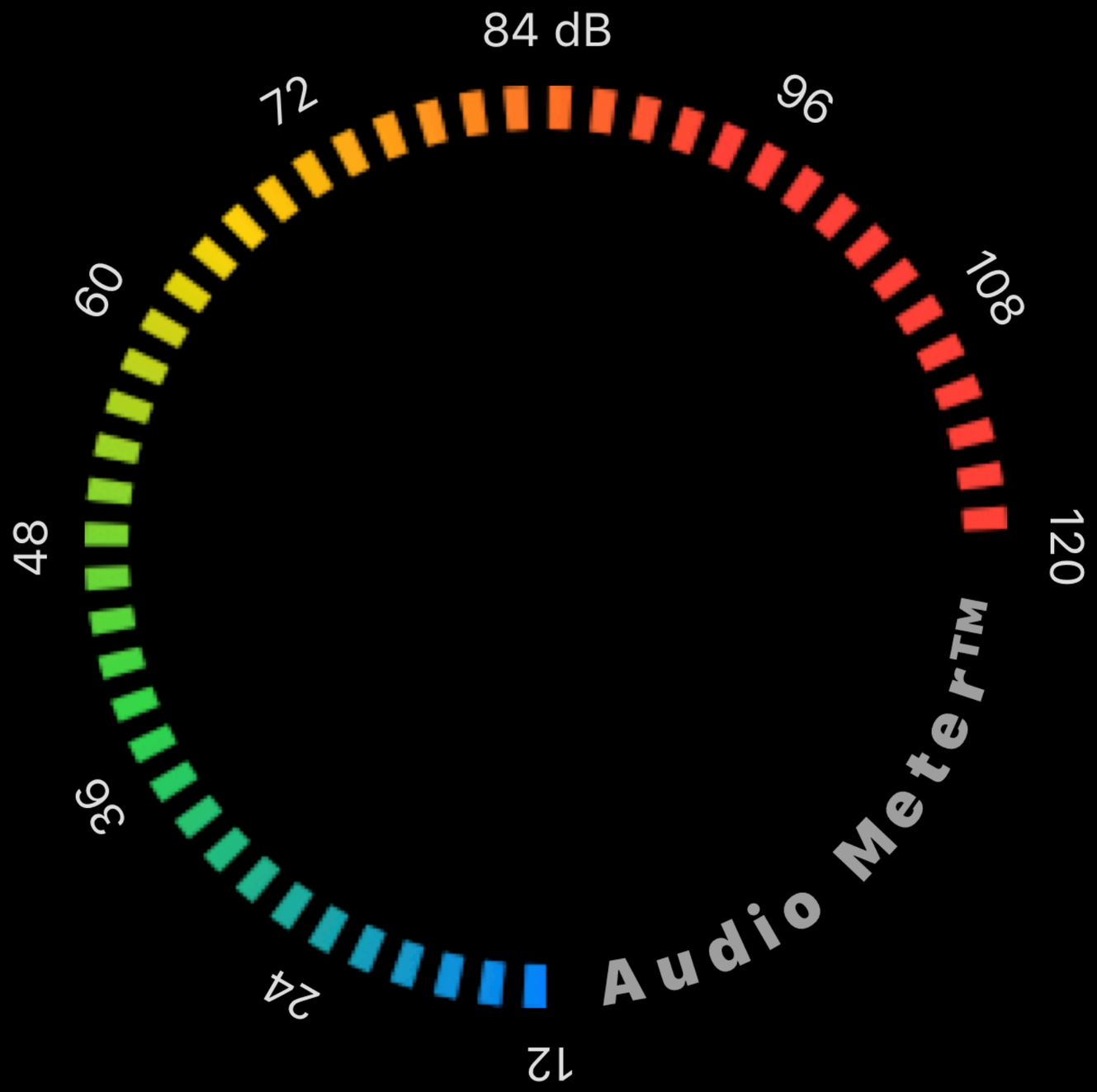

```
Text(character)
    .background(
        GeometryReader { proxy in
            Color.clear.preference(
                key: SizeKey.self,
                value: [proxy.size]
            )
        }
    )
```



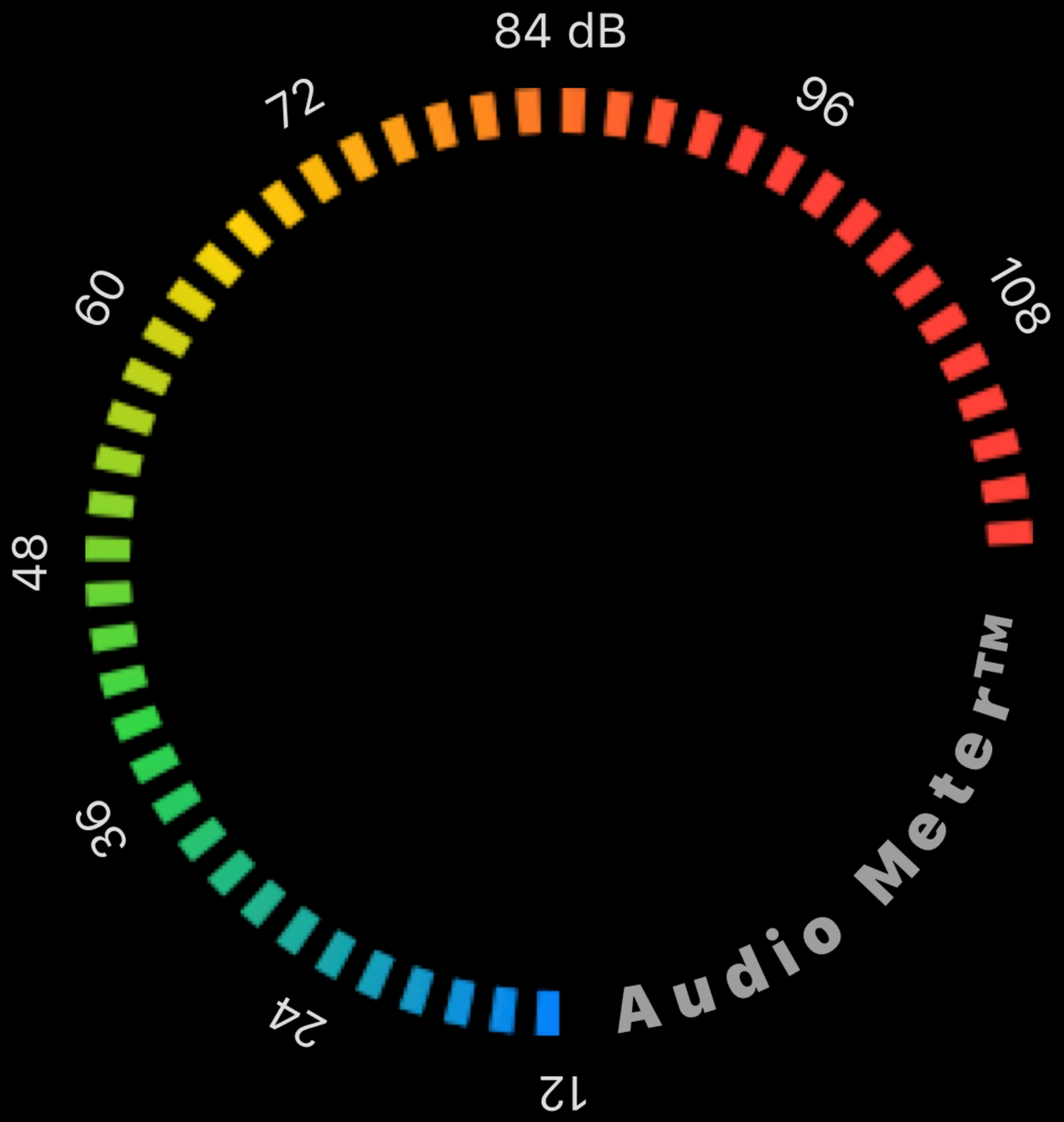

```
@State private var sizes: [CGSize] = []

ForEach(characters) {
    Text($0)
        .border(.randomColor)
}
.onPreferenceChange(SizeKey.self) {
    self.sizes = $0
}
```



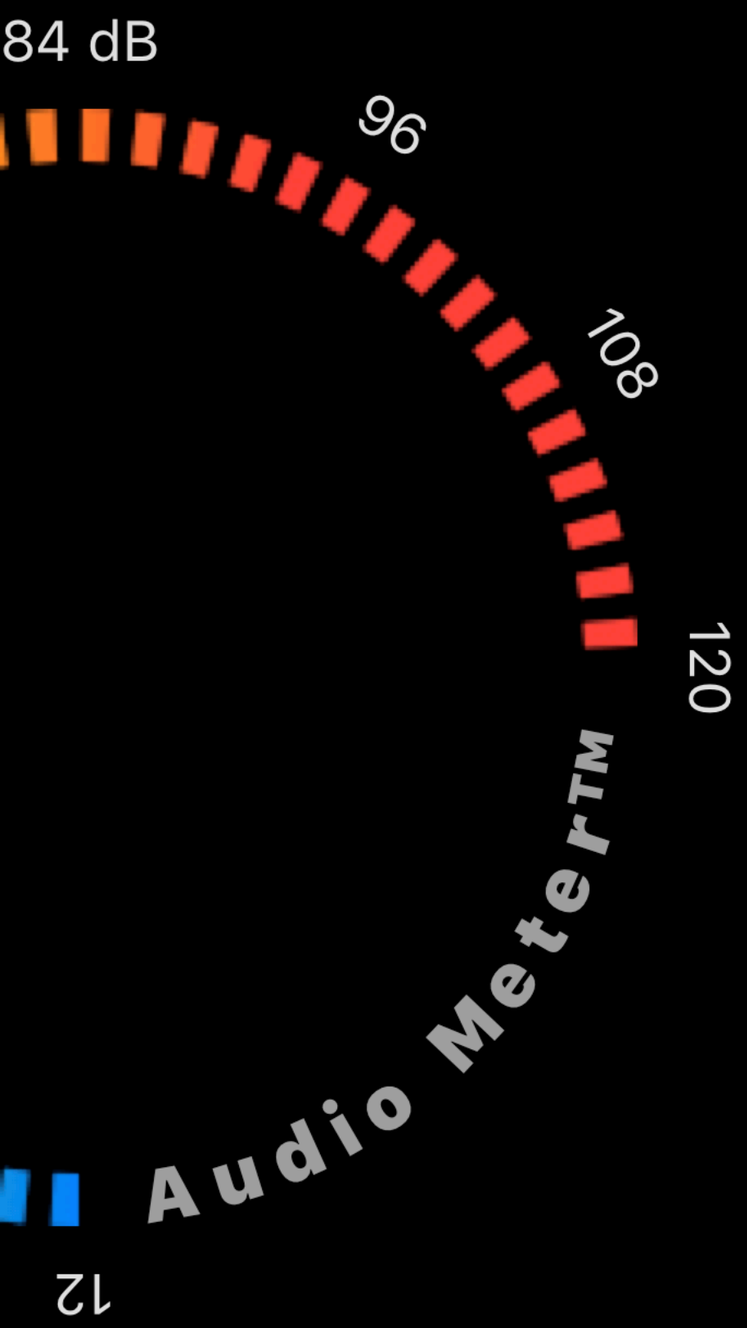

```
@State private var sizes: [CGSize] = []

ForEach(characters) {
    Text($0)
        .border(.randomColor)
        .frame(maxHeight: infinity,
               alignment: .bottom)
        .rotationEffect(...)
}
.onPreferenceChange(SizeKey.self) {
    self.sizes = $0
}
```



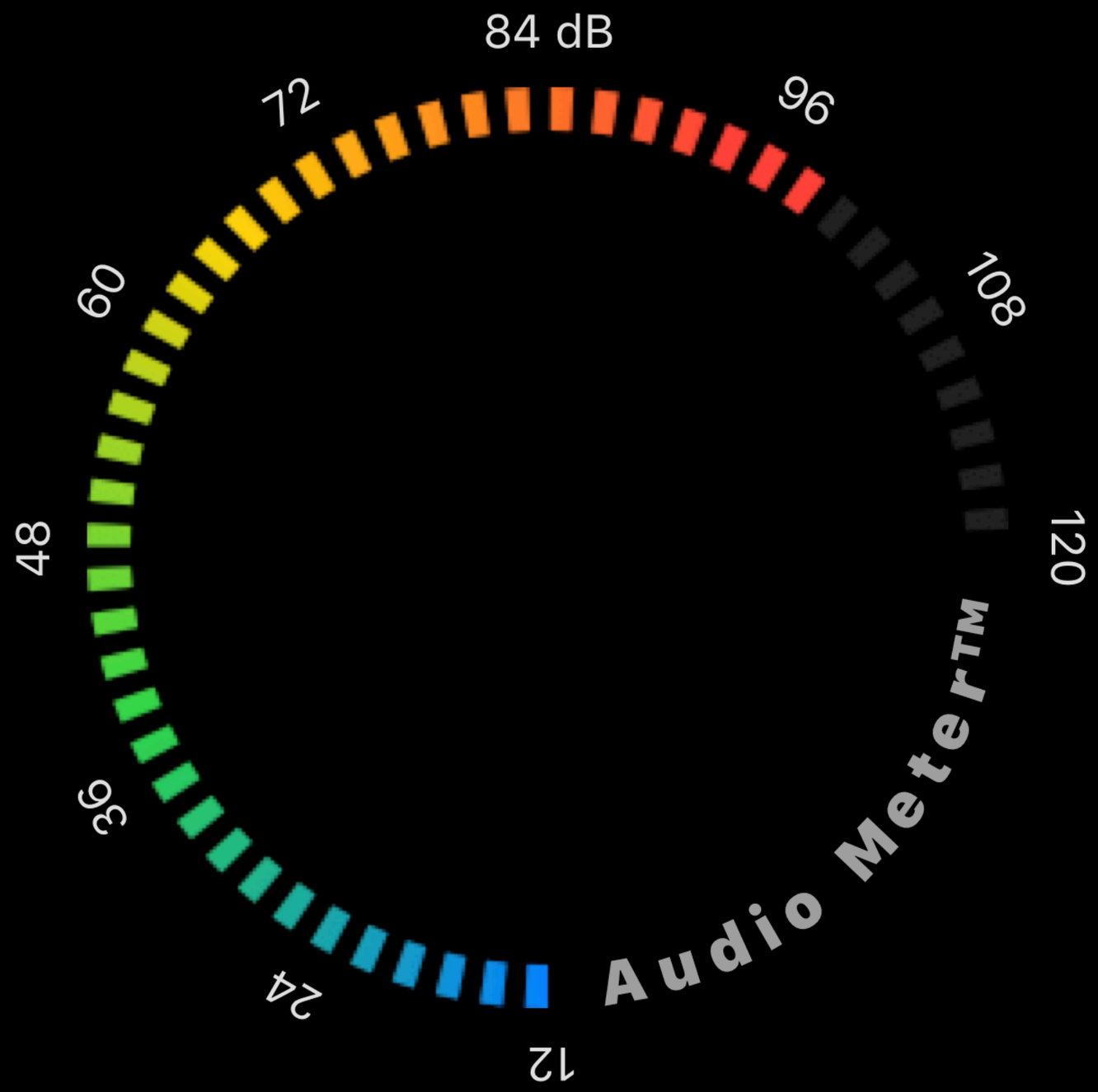

```
Text($0)
    .frame(maxHeight: infinity,
           alignment: .bottom)
    .rotationEffect(...)
}
```



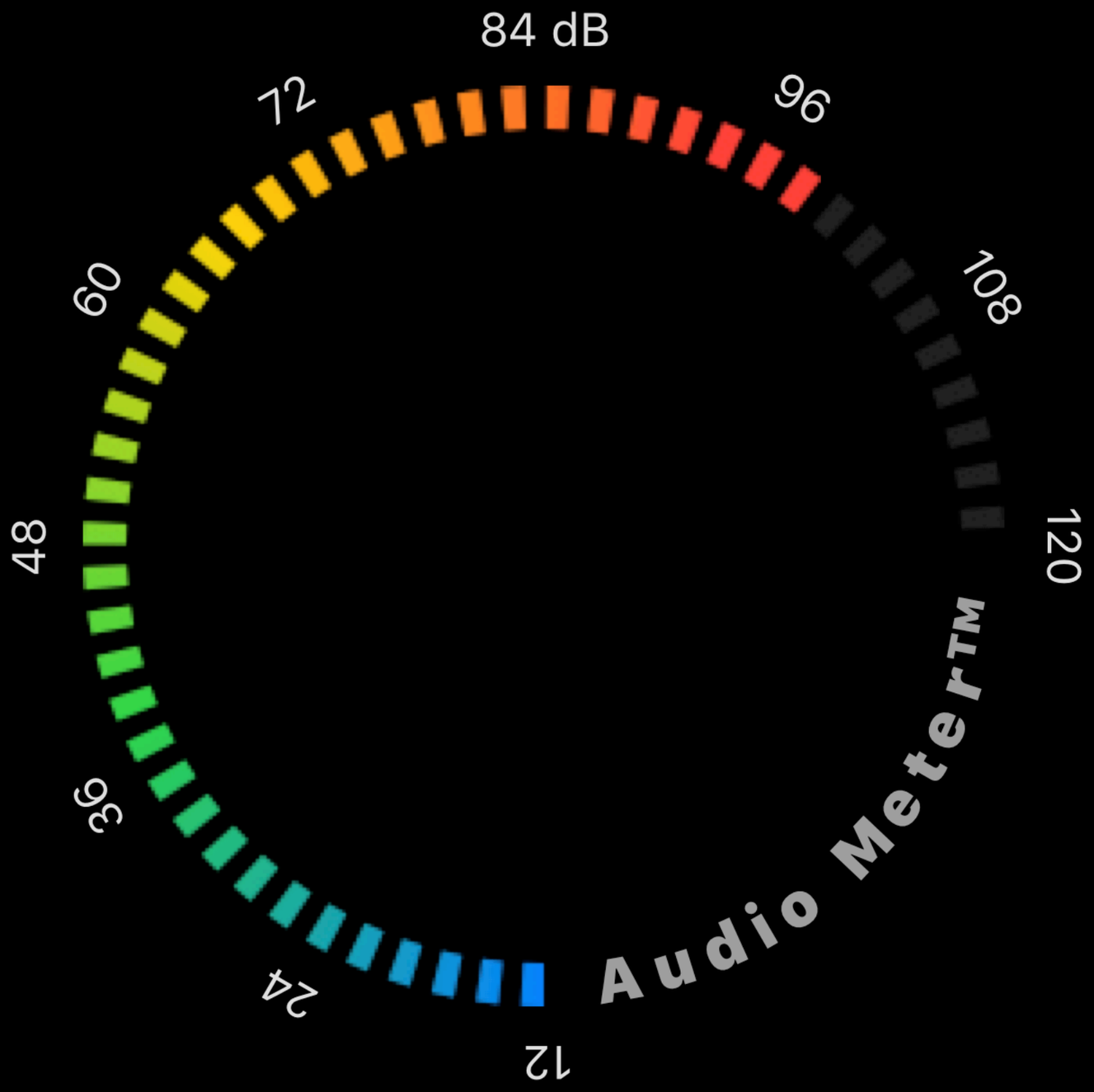

```
Float.random(in: 12...120)
```




```
class Audio: ObservableObject {
    @Published var decibels: Float = 12

    init() {
        Timer.scheduledTimer(withTimeInterval: 1/30,
                             repeats: true) { _ in
            self.decibels = .random(in: 12...120)
        }
    }
}
```




```
@ObservedObject audio = Audio()

var trimEnd: CGFloat {
    (audio.decibels - 12) / 108
}

var body: some View {
    Gauge(trim: 0..<trimEnd * 0.75)
}
```


84 dB
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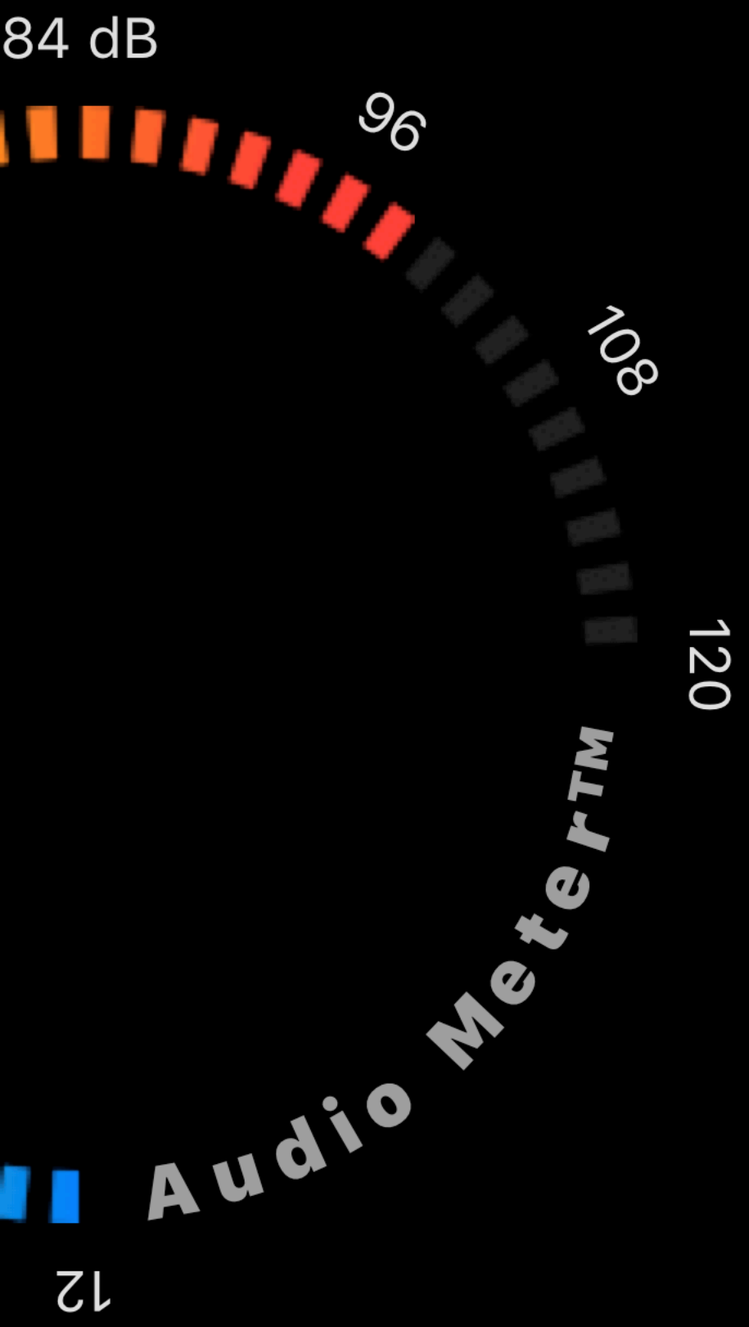
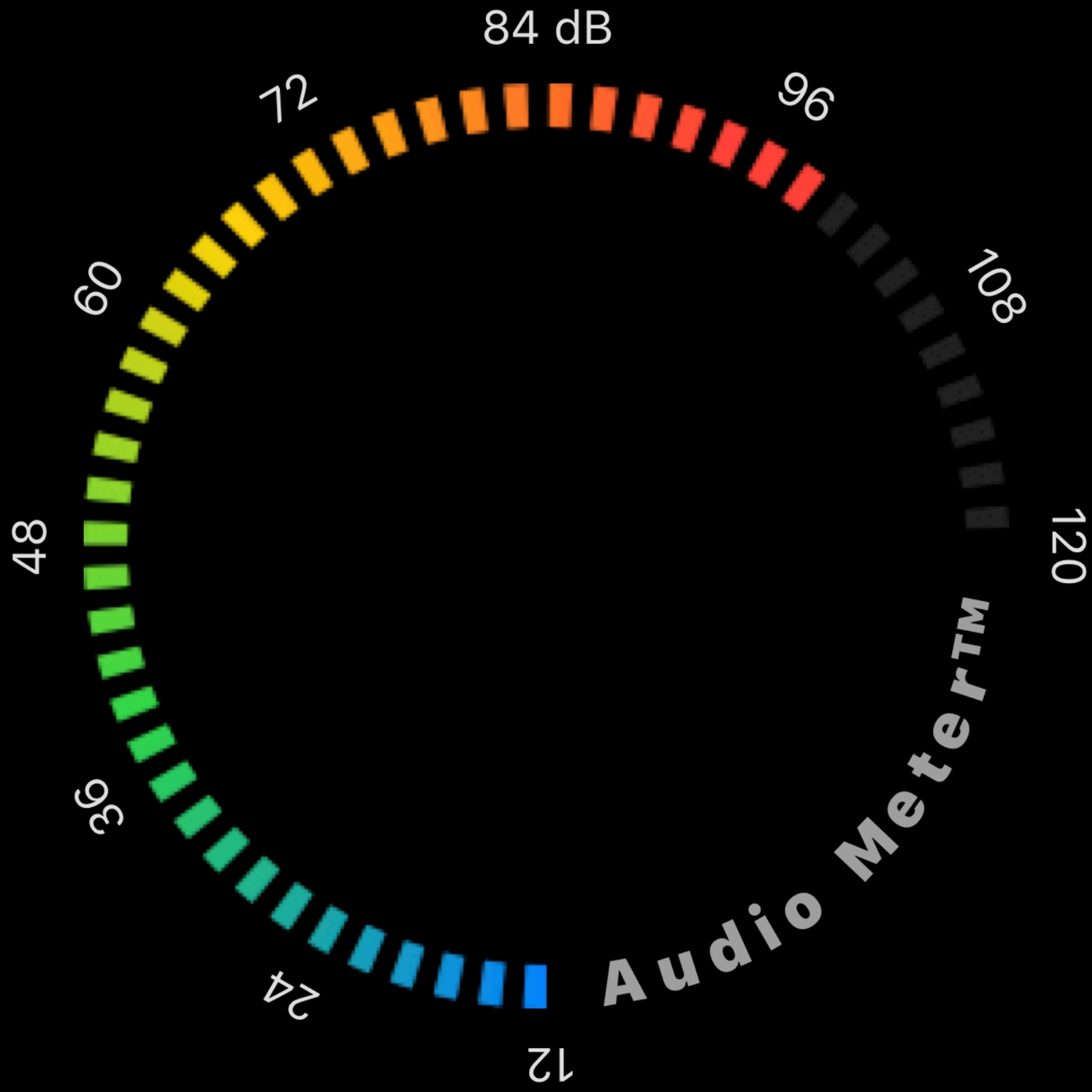
Audio MeterTM




```swift
import AVFoundation
import Accelerate

let engine = AVAudioEngine()
try engine.start()
let format = node.inputFormat(forBus: 0)
engine.installTap(onBus: 0, buffer: 1024, format: values) {
    let values = Array(
        UnsafeBufferPointer(start: $0.floatChannelData![0],
                            count: Int($0.frameLength))
    )
    let rms = vDSP.rootMeanSquare(values)
    let decibels = 20 * log10(rms / /* Reference */)
    DispatchQueue.main.async {
        self.decibels = decibels
    }
}
```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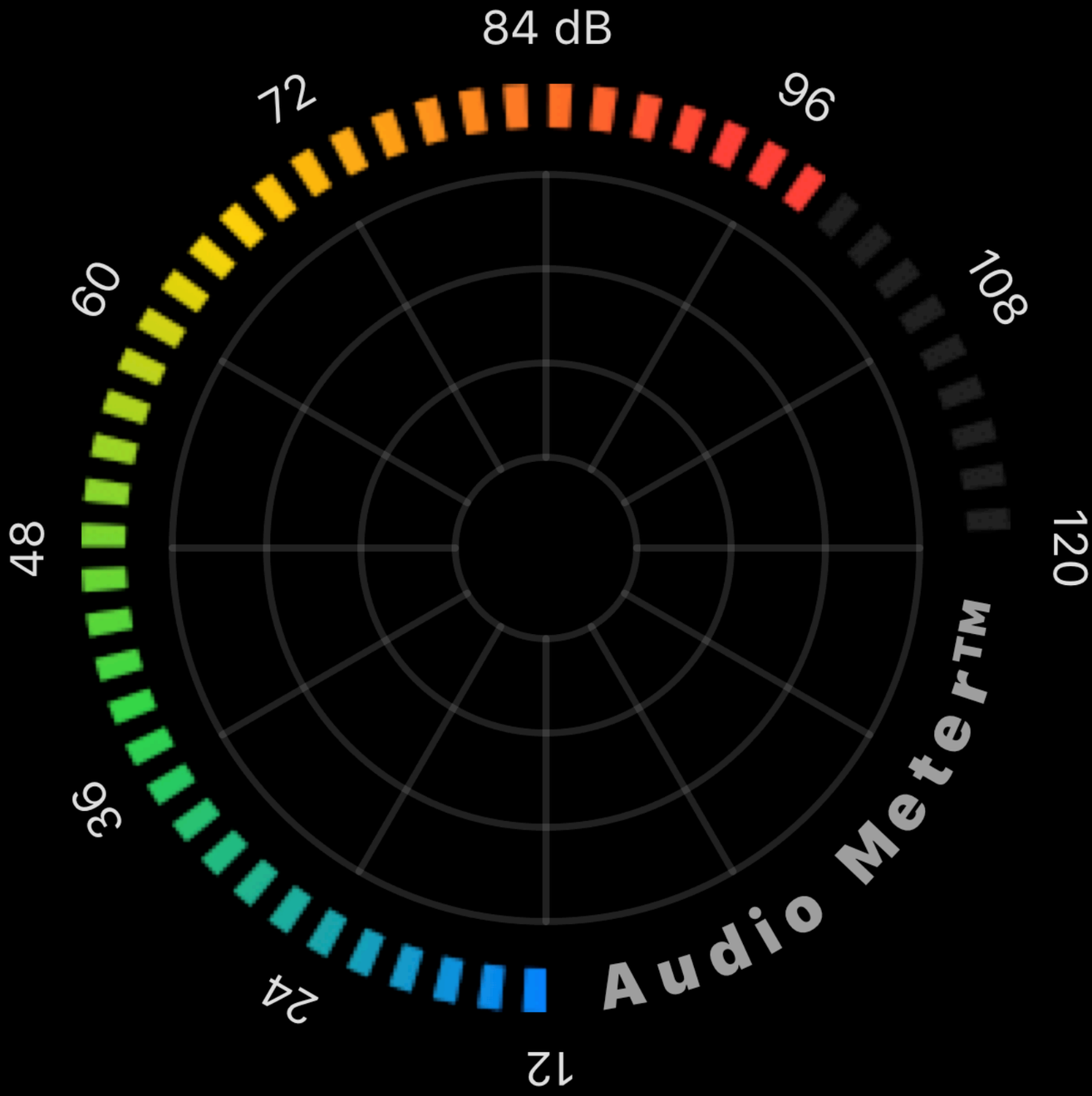
Audio Meter™


84 dB
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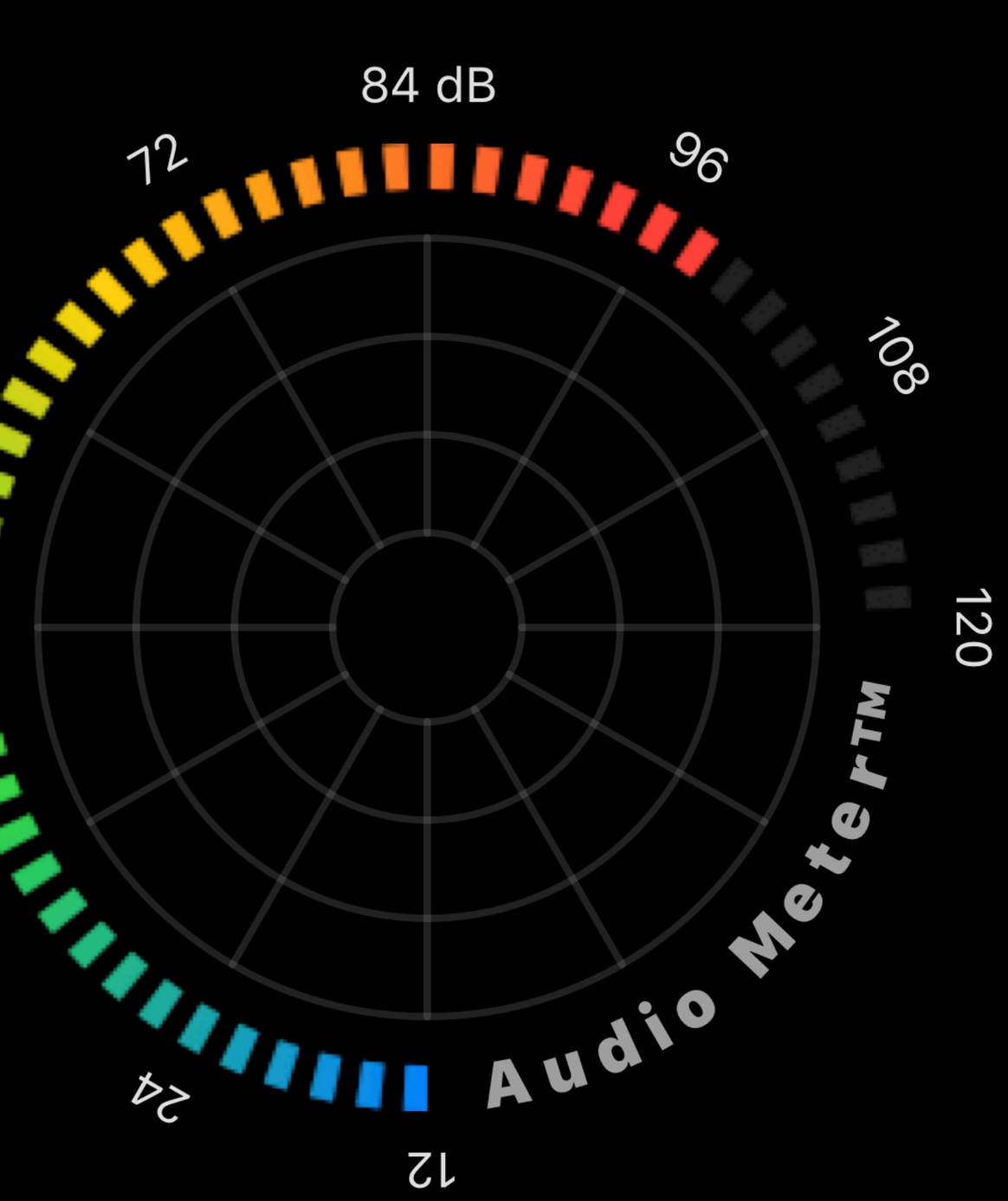
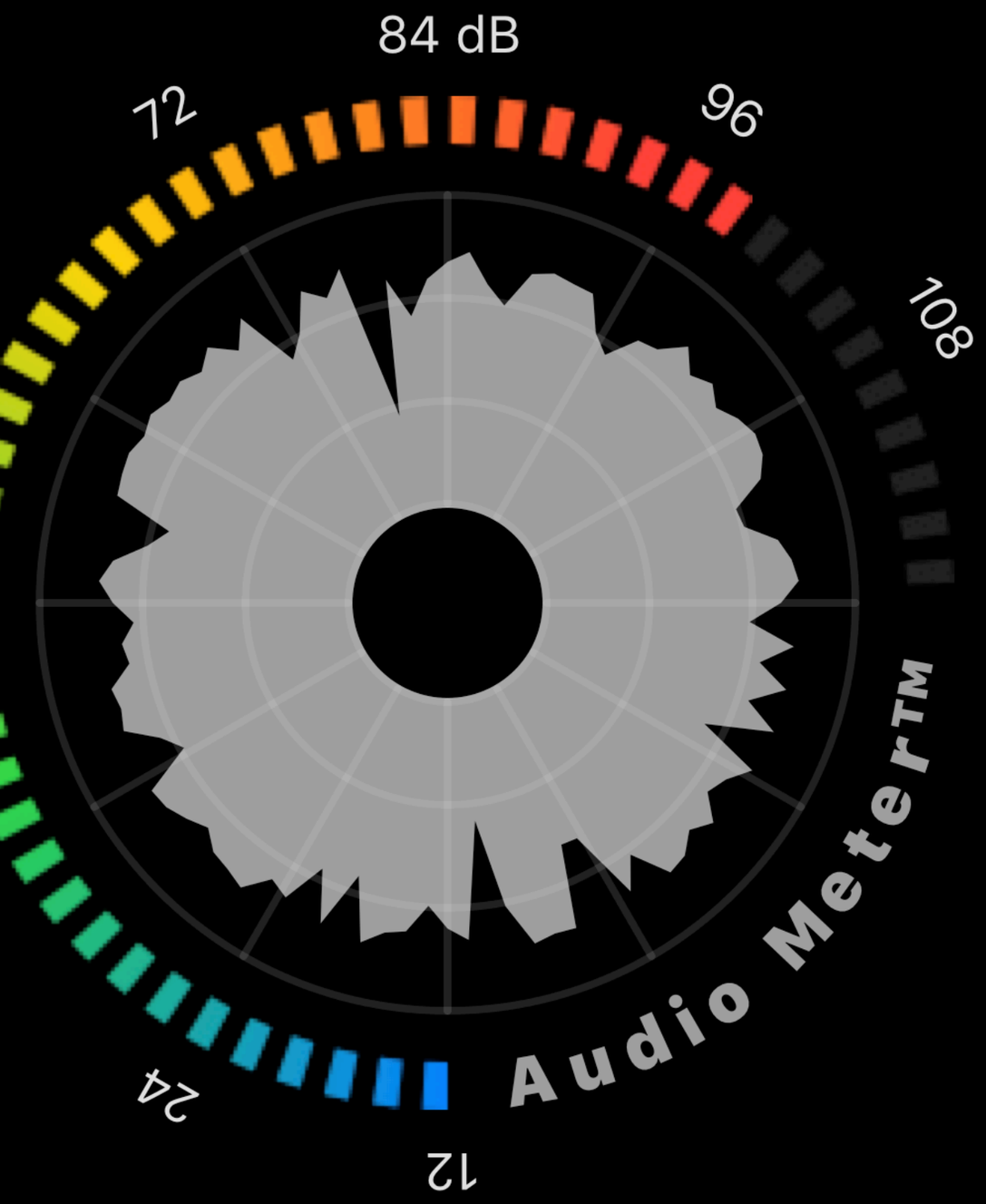
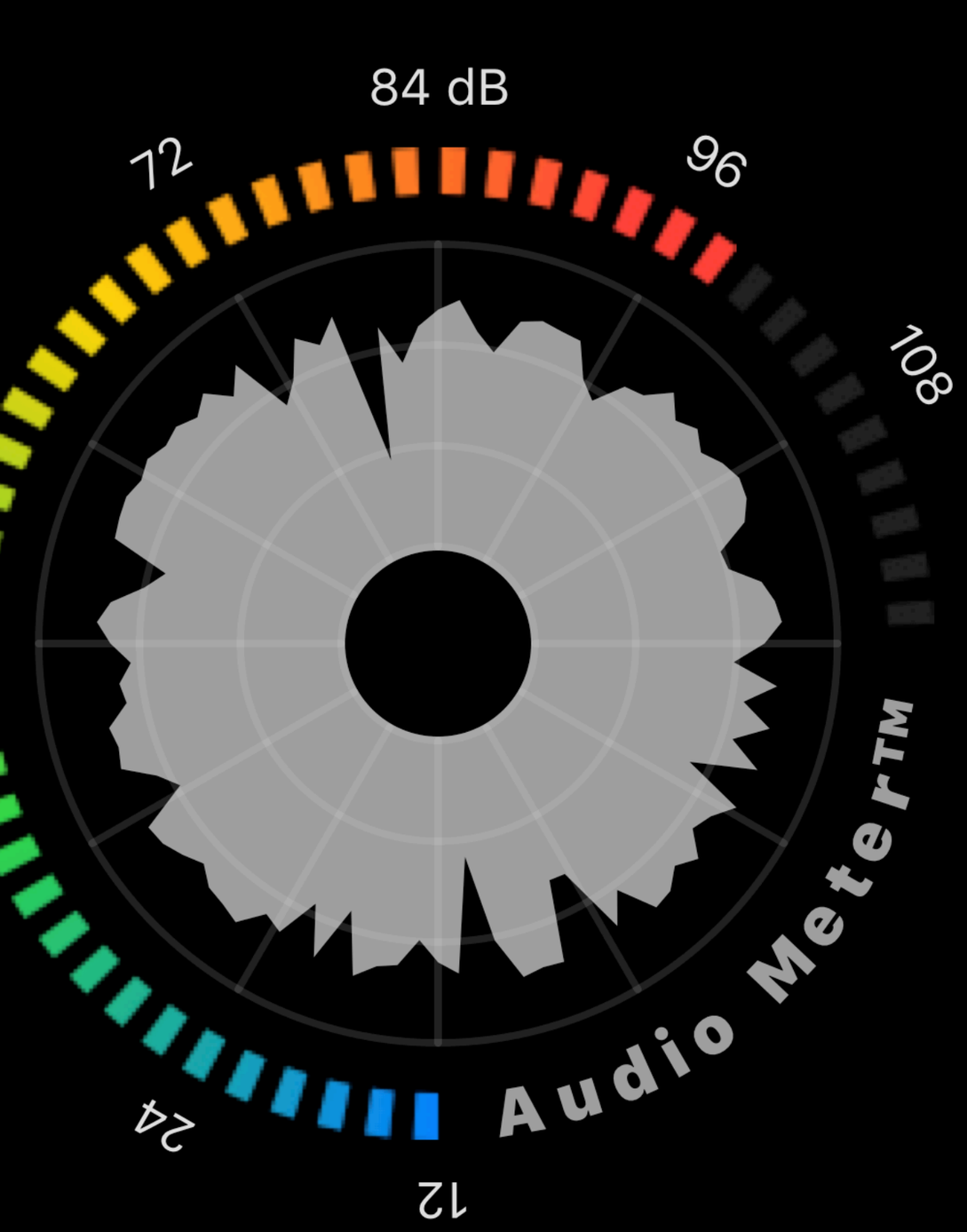


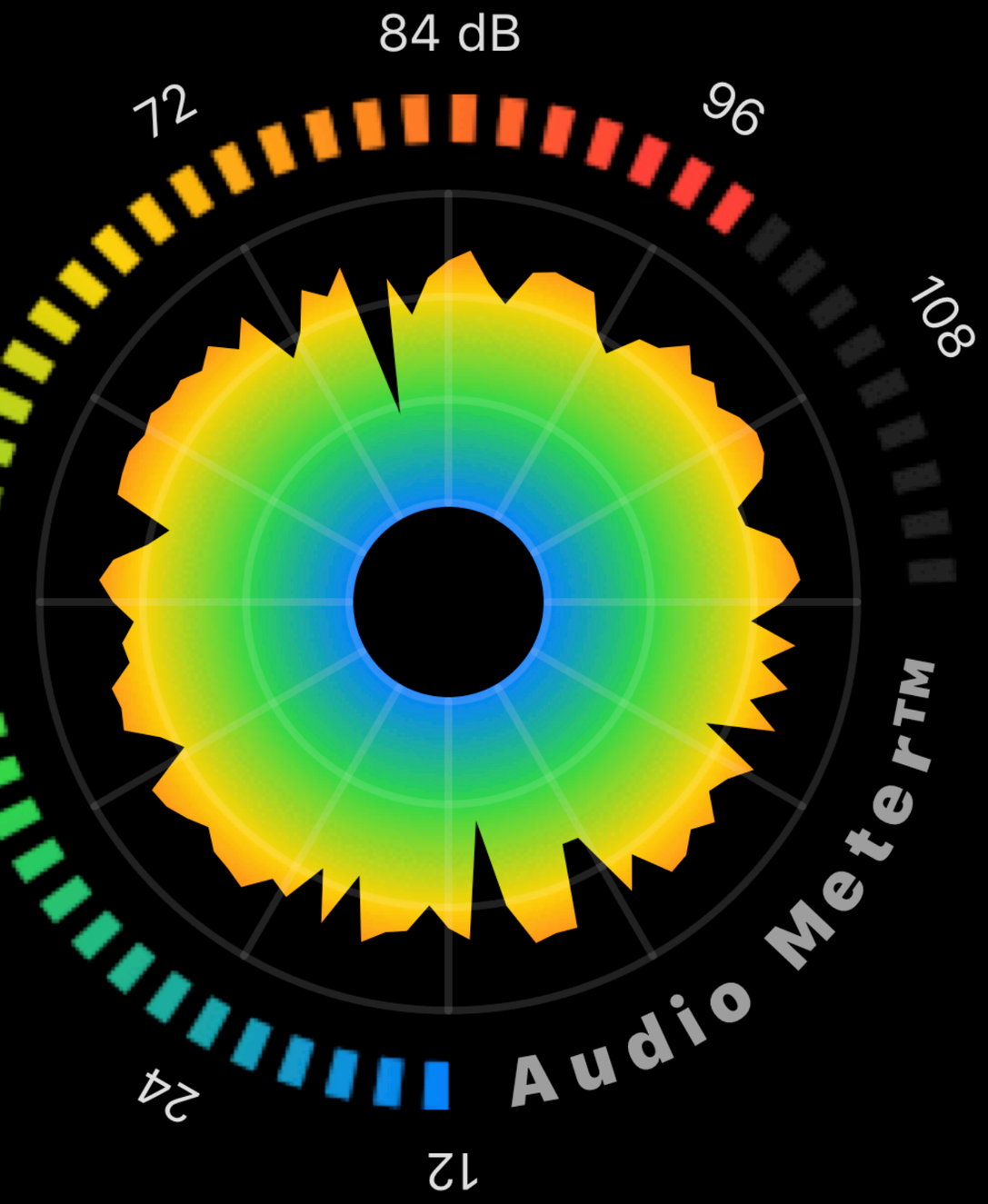

```
struct Graph: Shape {
    var values: [(Int, CGFloat)]

    func path(in: CGRect) -> Path {
        ...
    }
}
```



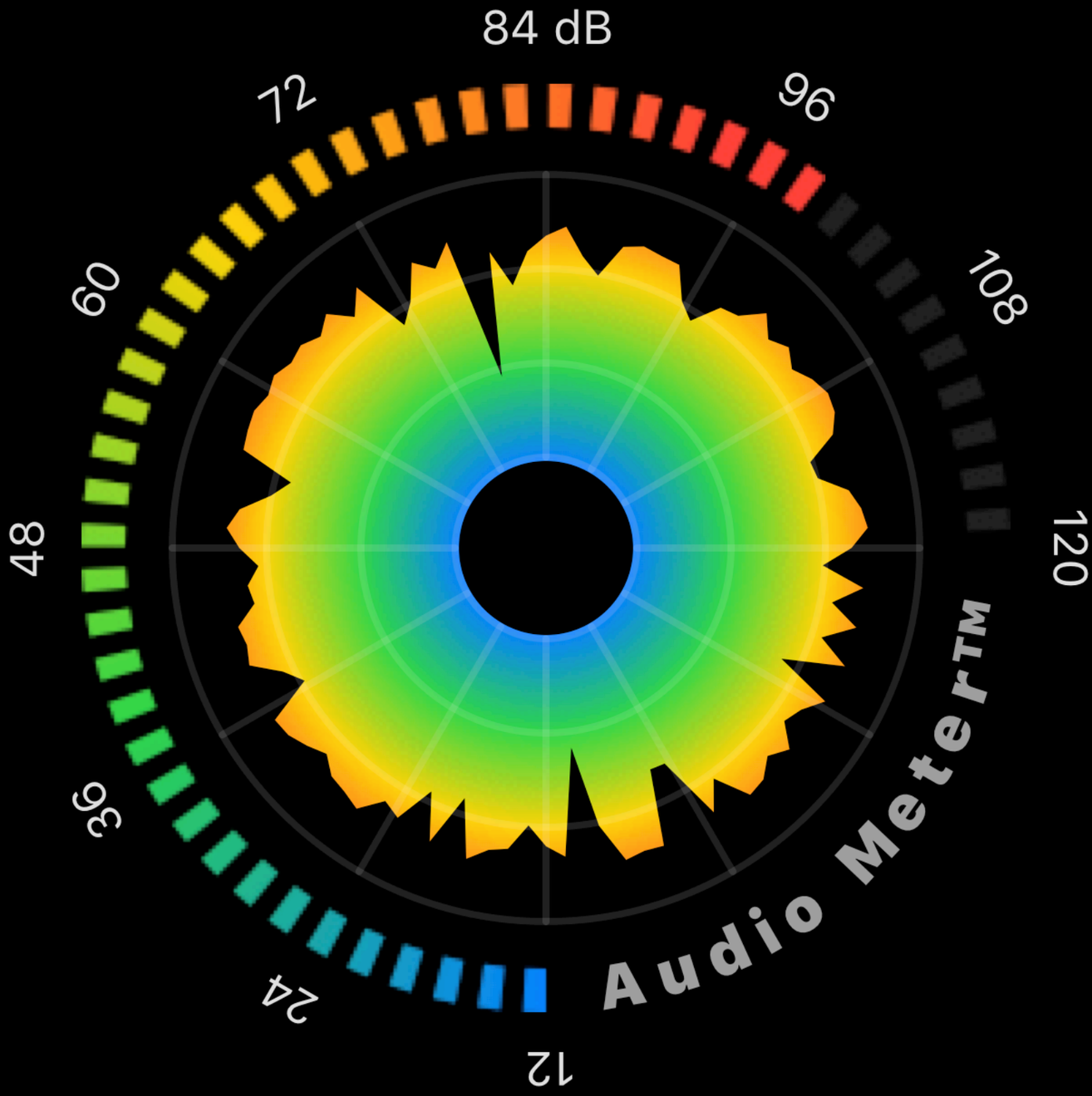

```
Path { path in
    let r = max(rect.width, rect.height) / 2
    let c = CGPoint(x: rect.midX,
                    y: rect.midY)
    for (index, value) in values {
        if index == 0 {
            path.move(to: /* Point */)
        } else {
            path.addLine(to: /* Point */)
        }
    }
    path.closeSubpath()
}
```




```
Path { path in
    let r = max(rect.width, rect.height) / 2
    let c = CGPoint(x: rect.midX,
                    y: rect.midY)
    for (index, value) in values {
        if index == 0 {
            path.move(to: /* Point */)
        } else {
            path.addLine(to: /* Point */)
        }
    }
    path.closeSubpath()
}
```




```
Graph(values: ...)
    .maskContent(using:
        RadialGradient(
            gradient: ...,
            center: .center,
            startRadius: 50,
            endRadius: 300)
    )
```


84 dB
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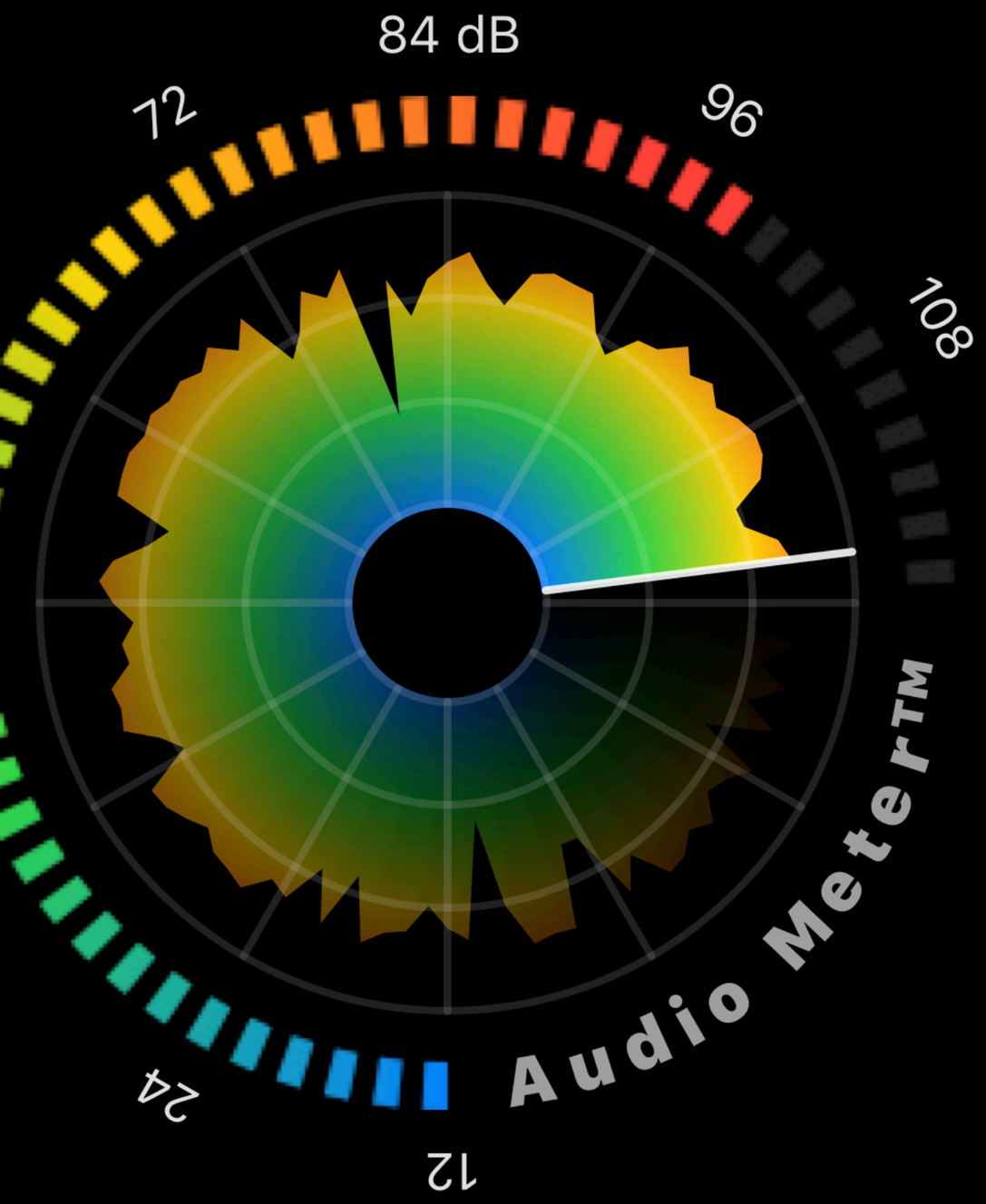
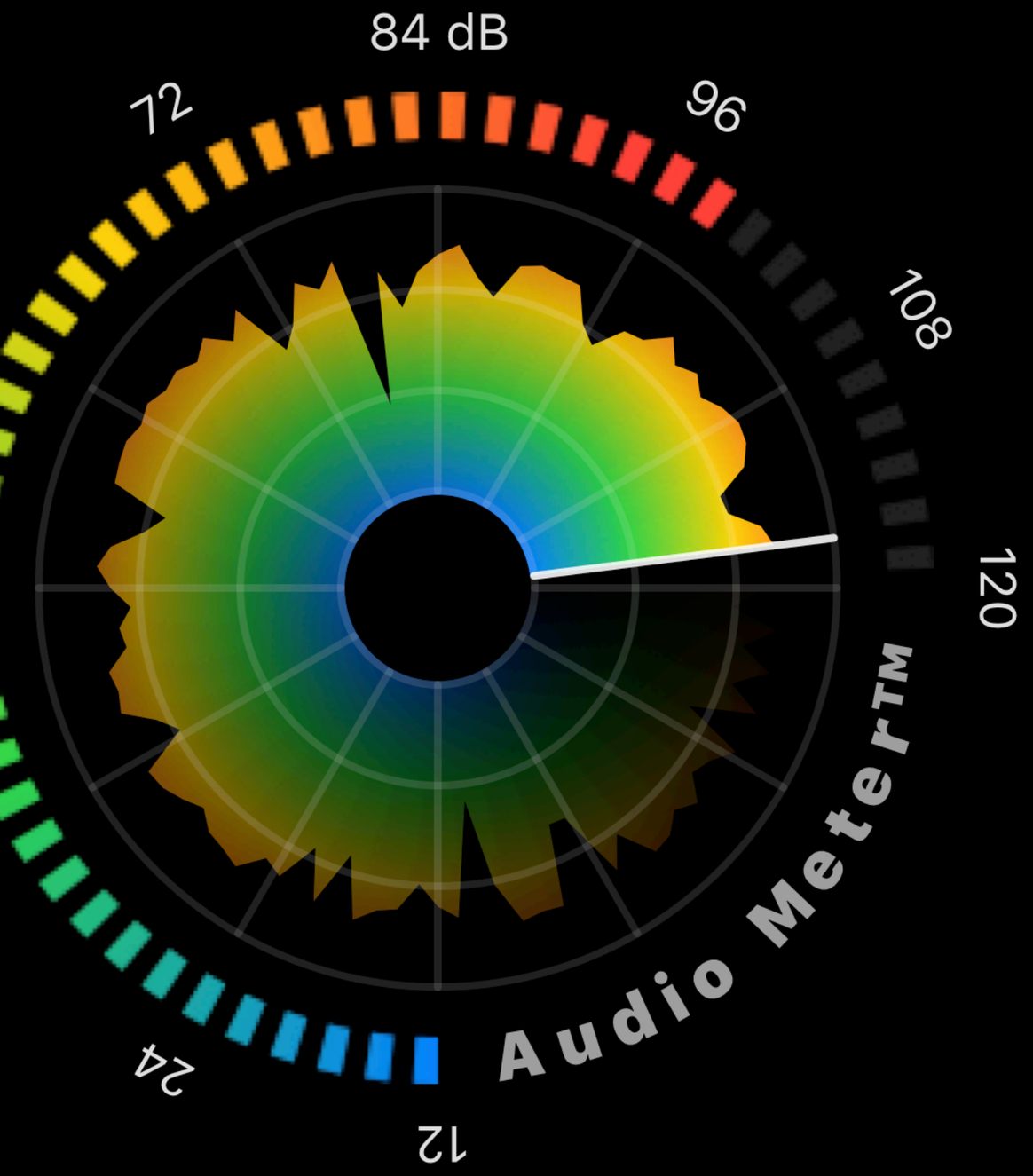
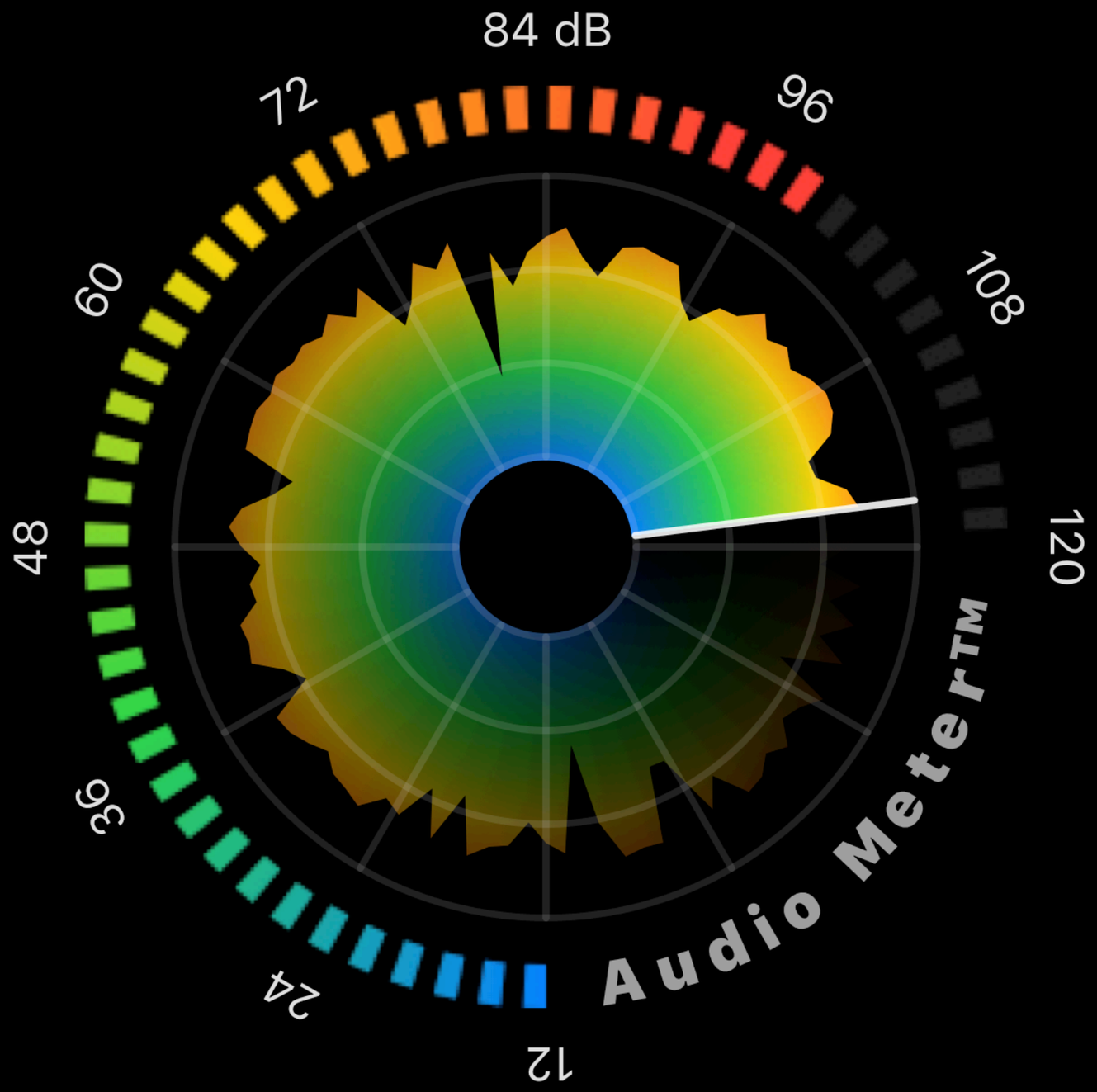



```
ZStack {
    Graph()
        .maskContent(using:
            fadeGradient()
                .rotationEffect(/* Angle */)
        )

    ScannerLine()
        .rotationEffect(/* Angle */)
}
```

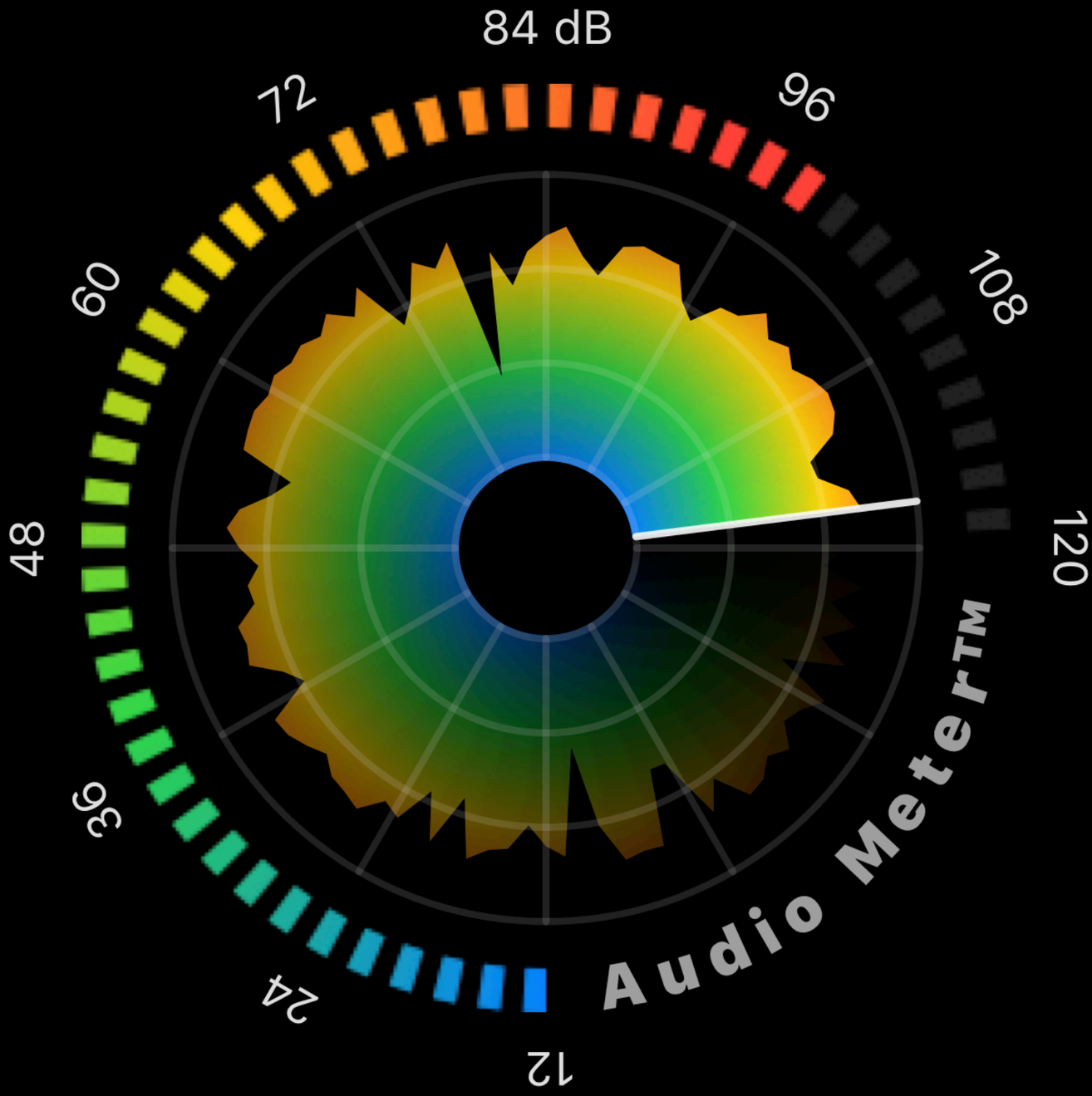



```
ZStack {
    Graph()
        .maskContent(using:
            fadeGradient()
                .rotationEffect(/* Angle */)
        )

    ScannerLine()
        .rotationEffect(/* Angle */)
}
.animation(
    .linear(duration:
        audio.sampleDuration)
    )
)
```




```
@State var timing: Double = 0

Gauge()
    .animation(.easeOut($timing))
```

Timing: 0.0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